GUIDELINES FOR ISSUING A SERIES OF GAZETTES ON ORGANIC FARMING THAT WOULD BE PERMITTED WITHIN THE MAHAWELI ZONE AND THE SURROUNDING KNUCKLES WATERSHED

THIS NOTE HAS BEEN **PREPARED BY CHRIS TILAKE-SRI DHARMAKIRTI** BASED UPON A STUDY OF THE BEST PRACTICES IN NORTH AMERICA, EUROPE AND ASIA. IT WAS DONE IN RESPONSE TO AN EVALUATION REQUEST BY THE SECRETARY TO THE MINISTRY OF MAHAWELI DEVELOPMENT, IRRIGATION AND AGRICULTURE, **MAJOR GENERAL SUMEDHA PERERA** ON THE PROPOSED DRAFT GAZETTE THAT IS TO BE ISSUED BY THE MAHAWELI AUTHORITY AND THE AGRICULTURE MINISTRY FOR THE NEWLY CREATED EXCLUSIVE ORGANIC AGRICULTURE ZONE.

IT MUST BE STATED UPFRONT THAT THE COMPREHENSIVE NATURE OF IMPLEMENTING AN ORGANIC ZONE REQUIRES A PHASED APPROACH TO PUTTING IN PLACE THE RULES AND REGULATIONS FOR THE ZONE. THUS THIS NOTE WILL ATTEMPT TO FILL IN THE GAPS, AND WOULD SUGGEST THAT THE MINISTRY CONSIDER ISSUING A SERIES OF GAZETTE NOTIFICATIONS COVERING VARIOUS ASPECTS ONE BY ONE, AS PER THE CONTENT DESCRIBED BELOW. BOTH THE AGRICLTURE MINISTRY AND MAHAWELI AUHORITY NEED TO USE THE BEST AVAILABLE LEGAL PROVISIONS TO ISSUE THE GAZETTES UNDER APPROPRIATE JURISDICTION, USING THE CORRECT INSTITUTIONAL FRAMEWORK.

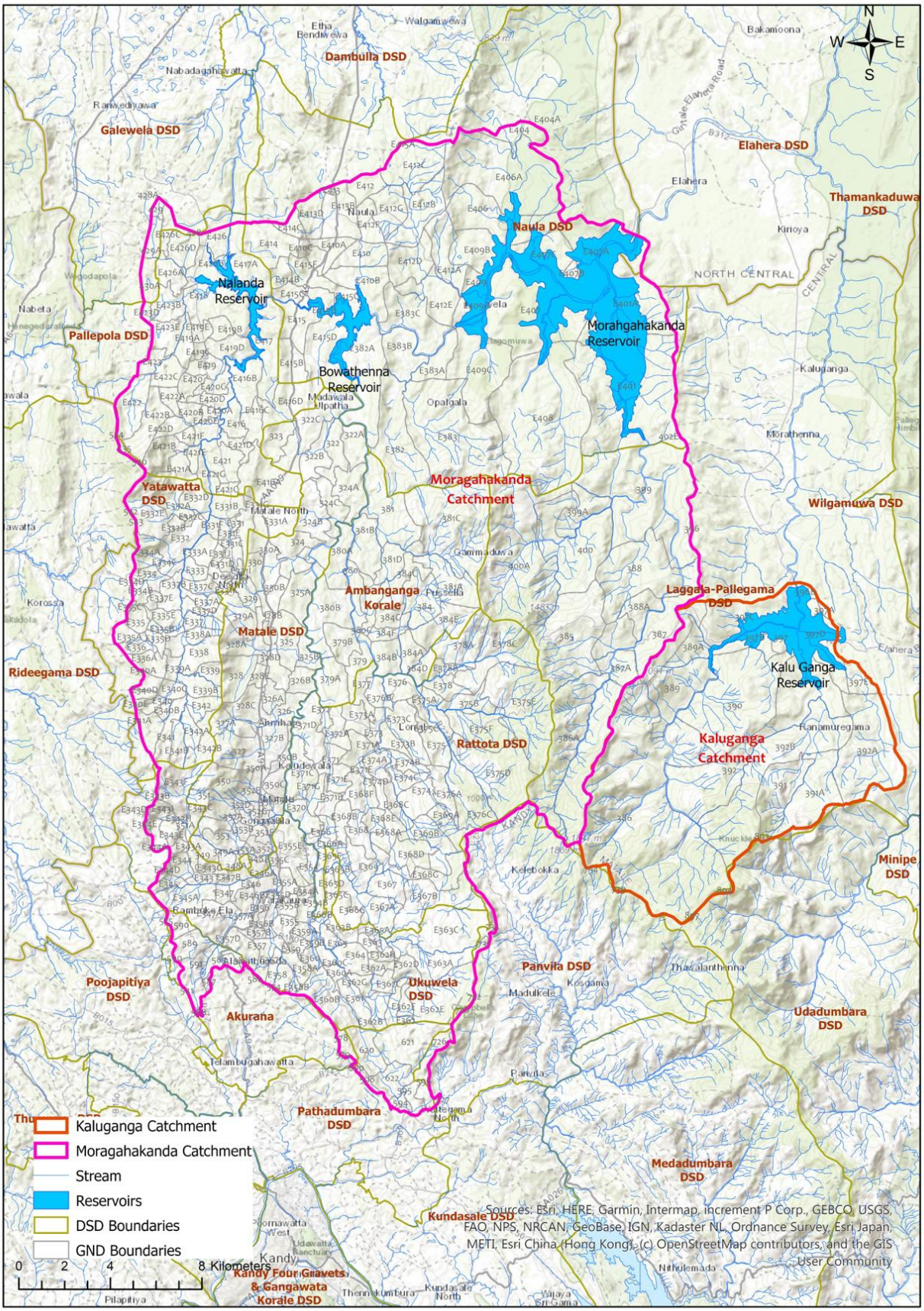
PREPARED ON 6 JUNE 2020, MATALE, SRI LANKA. CONFIDENTIAL

THE REGULATIONS FOR ORGANIC AGRICULTURE OPPORTUNITY MUST ENCOMPASS LIVESTOCK FARMING IN ITS FULL RANGE; (BEE KEEPING AND FUNGI FARMING) ; RICE FARMING; VEGETABLE AND HERB FARMING; MEDICINAL PLANTS; FRUIT PLANTATIONS; TEA, COCONUNT AND SPICE PLANTATIONS; HORTICULTURE; INLAND FRESH WATER FISHERIES; GREENHOUSE FARMING; THE PRODUCTION OF COMPOST FERTILIZER; POST HARVEST HANDLING AND TRANSIT; FOOD PROCESSING AND MOST IMPORTANTLY THE FARM SOIL MANAGEMENT; WATER SUPPLY QUALITY ASSURANCE AND THE SUROUNDING WATERSHED ECOSYSTEM MANAGEMENT AND MITIGATION AND ADAPTATION MEASURES FOR CLIMATE CHANGE AS WELL AS BIODIVERISTY PROTECTION AND THE MEASURES TO PROTECT SOCIAL, CULTURAL AND ENVIRONMENTAL IMPACTS. SRI LANKA HAS THE UNIQUE OPPORTUNITY IN THE POST COVID PANDEMIC PRONE ERA TO REFDIFINE THE CONCEPT OF ORGANIC AGRICULTURE TO ENCOMPASS FOREST GARDEN ECOSERVICES AND BIODIVERSITY PROTECTIVE AGRICULTURE TO CREATE A UNIQUE NICHE IN THE EXPORT MARKETS.

IT IS SUGGESTED THAT THE MINISTRY OBTAINS THE EXPERTISE FROM THREE UN AGENCIES, THE FAO (FOREST AND AGRICULTURE ORGANIZATION); UNOPS (UNITED NATIONS OFFICE OF PROJECT SERVICES); AND UNEP (UNITED NATIONS ENVIRONMENTAL PROGRAM) PLUS THE EUROPEAN UNION (EU) AND THE GOVERNMENT OF CANADA TO GET FURTHER INPUTS TO PREPARE A COMPREHENSIVE SET OF ORGANIC ZONAL REGUALATIONS TO ENSURE EXPORT MARKET ACCESSEBILITY FOR AGRICULTURAL PRODUCTS ORIGINATING FROM THIS MAHAWELI ZONE.

THIS STUDY NOTE CONFIRMS THAT THE GAZETTE MUST COVER A WIDE RANGE OF SUBJECTS, FROM STIPULATING THE INPUTS FOR PRODUCING ORGANIC COMPOST FERTILIZER BY THIRD PARTIES AND FARMERS THEMSELVES; TO THE FARM MANAGEMENT STANDARDS; THE PERMITTED USE OF SEEDS AND CROP ROTATIONS; TO POST HARVEST PROCESSING OF FARM PRODUCE IN THE PRODUCTION OF FOOD GRADE ITEMS; TRANSIT HANDLING STANDARDS TO PEST CONTROL AND OTHER AGRICULTURE PRODUCTION STANDARDS THAT WOULD ENABLE SRI LANKA TO ESTABLISH MARKET ACCESS TO LUCRATIVE ORGANIC CONSUMER MARKETS IN THE EUROPEAN UNION, NORTH AMERICA AND FAR EAST INCLUDING JAPAN.

THE NOTE COVERS REQUIREMENTS FOR FARMERS, FARM SUPPORT INPUT PROVIDERS AND COMPOST SUPPLIERS, AND ALSO PLANTATION MANAGEMENT COMPANIES AND FOOD PROCESSING INDUSTRY STAKEHOLDERS.


N
W
E
S
Dambulla DSD
Galewela DSD
Naula DSD
Elahera DSD
Thamankaduwa DSD
Pallepola DSD
Nalanda Reservoir
Bowathenna Reservoir
Morahgahakanda Reservoir
Moragahakanda Catchment
Yatawatta DSD
Matale DSD
Wilgamuwa DSD
Laggala-Pallegama DSD
Kalu Ganga Reservoir
Kaluganga Catchment
Rattota DSD
Rideegama DSD
Ambanganga Korale
Minipe DSD
Panvila DSD
Ukuwela DSD
Poojapitiya DSD
Akurana
Udadumbara DSD
Pathadumbara DSD
Medadumbara DSD
Kundasale DSD
Kandy Four Gravets & Gangawata Korale DSD
NORTH CENTRAL
Kaluganga Catchment
Moragahakanda Catchment
Stream
Reservoirs
DSD Boundaries
GND Boundaries
0 2 4 8 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

1. GAZETTE DEMARCATION BOUNDARIES

The proposed gazette must correctly identify not only the Mahaweli Zone itself that the resettled farmers are going to be bound by the proposed rules and regulations, but also , to ensure the source of the water is not polluted, it is absolutely essential, as stated in the Cabinet paper that the upper catchment areas of both the Moragahakanda and Kalu Ganga Reservoirs are identified by GN and DS areas, to ensure that the Government rules and regulations apply to the specified areas identified by the relevant GN number and the appropriate DS division to ensure proper administrative oversight. Thus the following GN numbers must get included into the Gazette to ensure the upper catchment areas are also governed by a toxins free land use policy.

With respect to the GAZETTE NOTIFICATION, the command area needs to be broadened to include the entire upper catchment areas of both Kalu Ganga and Moragahakanda reservoirs, and the highland farmers in the upper areas needs to also follow organic practices, as well as the farmers residing within the zone.

THUS THE GAZETTE MUST EXPAND ITS GEOGRAPHIC AREA AND ALSO STIPULATE THE MANDATORY REQUIREMENTS THAT EACH FARMER MUST FOLLOW WITH PUNITIVE MEASURES, LIKE THE RISK OF LOSING THEIR LAND OR FINES, to ensure 100% compliance. The Mahaweli Authority has sufficient legal powers to ensure compliance. As for the areas outside of the Mahaweli Authority jurisdiction, the Agriculture Ministry must cite the appropriate legal provisions, either from the Land Commissioner's authority, or from the Agriculture Ministry's own authority derived through the Agrarian Services Department or whichever suitable entity, as per the Cabinet Decision to enforce the rules and regulations, with punitive as well as incentive based mechanism, and the entitlement of subsidized fertilizer inputs needs to be restricted and other measures put in place and stated in the Gazette to ensure compliance as well as assistance to the farmers to become organic agriculture practitioners.

The Mahaweli H Zone itself has its own boundary demarcations and the relevant DS division and GN areas needs to be also correctly identified to ensure that the farming community in the resettlement areas are totally governed by the proposed rules and regulations under the auspices of the Mahaweli Authority.

KALU GANGA CATCHMENT AREAS:

atchment Name	DISTRICT_NAME	DSD_NAME	GND_NAME	GND_CODE
alu Ganga	Kandy	Panwila	Kosgama	739
alu Ganga	Kandy	Udadumbara	Kaikawala	894
alu Ganga	Kandy	Udadumbara	Meemure	893
alu Ganga	Matale	Laggala-Pallegama	Etanwala	386
alu Ganga	Matale	Laggala-Pallegama	Ganga Henawala	389A
alu Ganga	Matale	Laggala-Pallegama	Gonawala	397B
alu Ganga	Matale	Laggala-Pallegama	Guruwela	397E
alu Ganga	Matale	Laggala-Pallegama	Halminiya	392
alu Ganga	Matale	Laggala-Pallegama	Imaduwa	390
alu Ganga	Matale	Laggala-Pallegama	Karandamulla	397C
alu Ganga	Matale	Laggala-Pallegama	Kivulewadiya	392A
alu Ganga	Matale	Laggala-Pallegama	Laggala Pallegama	397
alu Ganga	Matale	Laggala-Pallegama	Lakegala	391A
alu Ganga	Matale	Laggala-Pallegama	Mahalakotuwa	387
alu Ganga	Matale	Laggala-Pallegama	Miniranketiya	397D
alu Ganga	Matale	Laggala-Pallegama	Narangamuwa	391
alu Ganga	Matale	Laggala-Pallegama	Rambukoluwa	389
alu Ganga	Matale	Laggala-Pallegama	Ranamuregama	392B
alu Ganga	Matale	Laggala-Pallegama	Rawanagama	397A
alu Ganga	Matale	Laggala-Pallegama	Dammanthenna	399A
alu Ganga	Matale	Laggala-Pallegama	Divulgas Pathana	400A
Moragahakanda	Matale	Laggala-Pallegama	Gangalapuwakpitiya	400
Moragahakanda	Matale	Laggala-Pallegama	Ilukkumbura	388A
Moragahakanda	Matale	Laggala-Pallegama	Kahagala	388
Moragahakanda	Matale	Laggala-Pallegama	Meda Ela	387A
Moragahakanda	Matale	Laggala-Pallegama	Pitawala	385
Moragahakanda	Matale	Laggala-Pallegama	Pottatawela	399
Moragahakanda	Matale	Laggala-Pallegama	Rathninda	386A

MORAGAHAKANDA CATCHMENT AREAS are much more widespread encompassing the entire Matale district, parts of the Kandy district and even a small section of the Pollonaruwa district. Therefore, given the complexity of the current land use practices and the fragmented ownership as well as the multiple crop types, including the existence of large scale plantations ranging from spcies

to tea and even coconut, the Ministry could defer the implementation of the Moragahakanda catchment areas for inclusion into this zone, as a phase 2 option, after successfully implementing the Kalu Ganga Catchment Zone and the adjacent feeder zones for Moragahakanda, as identified in the above legend, as they are situated adjacent to the Kalu Ganga and also is within the Laggala Pallegama DS division and is isolated from any feeder contaminants. Selective areas within the Knuckles that can be isolated into its discrete mini watersheds should be brought into the zone management orbit in different phases. Please see the attached full list of GS and DN areas along with the marked map to determine which of these areas will be incorporated into the different phasing.

2 IDENTIFICATION OF IMPLEMENTATION HURDLES AND SOLUTIONS UPFRONT:

It must be recognized that the farmers who have been settled in this newly created Mahaweli Zone are not traditional organic farmers, although some of them are aware of indigenous practices, but most of them have been carrying out standard Agrarian Services Department advisory led farm practices that was heavily dependent on external farm inputs, such as chemical fertilizer, toxins heavy pesticides, herbicides and other artificial input based farming practices. Even the seed saving and use of traditional seed varieties are no longer part of the conduct of these farmers, and hence even with respect to sourcing seeds, they have become dependent on seed varieties recommended by the ASD officers and the fertilizer supply shop keepers.

Having thus realized the limited knowledge and exposure they have to carry out organic or permaculture farm practices, it is essential that the Ministry obtains the services of UN agencies, the EU and other nations that have implemented organic standard agriculture to help craft a strategy to assist the farmers to do a transition into organic agriculture.

This transition process must include recognition of the local knowledge gaps and develop a program to educate the farmers to adopt good organic farm practices and also have a broad understanding as to what organic agriculture entails in terms of their responsibilities as a farmer.

For example, the following broad areas needs to be addressed, as they were found to be the key risks for growers transitioning to organic:

2.1 Understanding of the Certification Process

A grower may not be able to access resources required to successfully navigate the certification process, including selection of a certifying body. The entire zone needs to be certified as an Organic Zone by both local and internationally recognized certification bodies, and they in turn could be tapped to conduct workshops to teach the farmers the compliance requirements to maintain their organic standards.

2.2 Record Keeping

Insufficient or inaccurate records may lead to a crop not being certified. The burden of record keeping may lead to a grower not completing transition process.

To show compliance with the organic standard, transitioning farmers need to keep records of most of their activities. While paperwork is NOT a common practice for farmers, the need to document and keep record of the farm operations is significantly higher under organic production. Inadequate record keeping can have significant consequences by delaying the transition for a year or more or even impeding the attainment of the certification altogether.

This means, the Mahaweli Authority's designated ZONE management team AS WELL AS THE AGRARIAN SERVICES DEPARTMENT GS advisory officers themselves needs to be trained to carry out regular visits to farmers and ensure that record keeping is done in a timely manner and provide assistance to the farmers by engaging the secondary school going children to assist their parents and the neighbours to maintain farm records and incorporate organic farm certification course as part of the local school curriculum to ensure the records are properly maintained.

The Department of Agrarian Services and the Export Agriculture promotion officers and all other allied officers, including the SAMURDHI, GRAMA NILADHARI and DISTRICT SECRETARIAT LAND OFFICERS, CEA officers, and the FOREST AND WILDLIFE Department officers, and the POLICE officers attached to each area needs to also train their staff and create a special Organic Agriculture Advisory

Services sub unit that assigns trained officers to this geographical region. They need to understand the Zone Rules and Regulations and what their roles and responsibilities are to ensure the conduct of farmers within that designated zone is governed.

2.3 Weed Management

A grower may not be able to access the resources required to adequately maintain control of weeds and other pests.

Farmers need to move towards a more preventative and integrated or holistic approach to pest monitoring, detection, and control. Disease and weed management is one of the most significant obstacles for transitioning producers and is perceived by conventional producers as the biggest challenge to overcome. While solutions exist, growers may not be able to access the extension resources required to adequately maintain control of weeds during the transition period.

2.4 Non-Allowable Inputs

A lack of clarity on inputs allowed for organic certification may lead to a crop not being certified.

During the transition period farmers must move away from conventional inputs (and suppliers) and learn how to select and use organic certified ones. This shift requires farmers to fully understand which inputs are allowed. Failing at doing so and using non-allowable inputs may lead to a crop not being certified.

2.5 Few Buyers

Growers relying initially on a single buyer may lose their market if the purchasing business fails. The anticipated organic market premiums may not come to fruition. The Mahaweli Authority must establish an ORGANIC PRODUCE RETAIL SUPERMARKET OR OUTLETS IN COLOMBO, KANDY, KURUNEGALA, DAMBULLA, AND GALLE, to ensure that the produce from this zone will be offered a higher premium to normal produce for the local hotel market, and also actively canvass the Export Marketers to establish direct buying links with the farmers of the zone.

Several other risks were identified as also being significant for transitioning growers, including the following. It is important that mitigation strategies be considered for limiting the potential impact of these risks for a transitioning grower and consequently the organic industry.

2.6 Parallel Production

Growers may not be aware that production of the same crop both conventionally and with organic practices may lead to a crop not being certified.

Many individuals are reported to have failed at initial certification attempts because they grew the identical crop both conventionally and organically. This is not allowed under export organic standards.

2.7 Maintaining Yield

The upper catchment areas of this Mahaweli Zone, the UDASIYA (Illukumbura, Atamwala, Pitawala, Ranamure, Puwakpitiya, etc) which are areas that continue to grow vegetables and rice using current agricultural practices, are likely to initially, within the first three years, may suffer a lower yield harvest once they transition to organic production. As farmers move away from conventional production techniques to adopt organic ones, it is expected that yields will decrease. This reality of lower yields, whether for plant crops or livestock, appears to be generally accepted by the industry, but it is a risk that must be accounted for and mitigated against. However, with respect to this newly established Mahaweli Zone, which is virgin land that is uncontaminated from previous farming activity, the quality of the soil should be sufficient to produce a good acceptable yield, even without the application of fertilizer inputs, be it organic or chemical.

2.8 Peer Stigma

Many transitioning growers face stigma from other growers in their neighbourhood, with the social detachment possibly a considerable personal risk, as the Dambulla market nearby is the haven for non organic farmers bringing in their produce. This should be reversed by giving the farmers of this zone a higher status at Dambulla market, by establishing a buying office that pays a premium for the vegetables from the organic zone, and thereby change the perceptions and the adoption rates of conventional farmers from other areas.

2.9 . Maintaining Cash Flow

Products during transitional years may be lower yield or quality, without organic premium and sometimes difficult to market at all, resulting in reduced revenue. In addition, a number of the other risks outlined in this report may also result in reduced cash flow.

Lower yields, together with the absence of premiums paid during the transition period, will likely lead to lower revenue for farmers. New farm operators or those carrying debt load would typically consider purchasing crop insurance to protect them in the event of a major crop loss caused by weather or disease, but appropriate insurance options are often not available to organic growers. The crop insurance program should be put in place immediately. Sri Lanka Insurance Corporation and private insurance companies must be consulted and requested to develop the crop insurance program and the Government should consider offering the payment of the premium to the Insurance companies to save downstream exposure in the event of crop failure or adverse climate change impact on the agriculture.

2.10. Access to Capital

The profits generated by production and sale of organic crops may not be sufficient to cover the high capital investment required for transitioning. Thus the fertilizer subsidy given in kind to non organic farmers needs to be paid in cash to the organic zone farmers, inclusive of their labour cost to improve the soil fertility management program, and the production of compost fertilizer, etc, that is considered good organic farm practices, which is more labor intensive.

Four other risks are also of note given their prevalence for several growers who provided input to this project:

2. 11. Fertility Management

A grower may find maintaining adequate nutrient levels a challenge when unfamiliar with organic production practices.

Conventional growers will understand the basic concept behind green manuring to increase fertility of the soil, for example. But translating those concepts into practice is challenging for many once their usual tools are no longer available under the organic management regime.

2.12. Access to Inputs

Growers may have challenges accessing organic seed and fertilizer (or organic feed for livestock) at cost-effective pricing. Mahaweli Authority can use the existing model farm in Laggala and other facilities to establish a large scale compost production facility with bagging equipment to supply 40 kg compost fertilizer to those farmers who are unable to produce their own compost as they lack resources to maintain their own cattle sheds and have no access to pasture grazing lands.

The issue of sourcing inputs is challenging for all types of crop amendments and livestock inputs. However, it is particularly acute in terms of seed availability for crop and vegetable production, to the extent that many growers reported going through the motions of documenting the unavailability of certified organic seed despite knowing that it would not be available. In the case of livestock, the organic field-crop sector will need to grow to supply sufficient local organic feed.

2.13. Access to Labour

Growers may have difficulty accessing sufficient labour for organic management practices, particularly the knowledge workers to produce compost and rotate crops for better soil fertility management. Thus the Mahaweli Authority, will need to assist the farmers to obtain shared services of knowledge workers from up country and other organic farms to be present in the zone to provide hands on assistance.

Organic production can also be a specific selling point for some consolidated organic producers who are looking to recruit workers who are more aligned with this style of production.

2.14. Market Channel Development

Growers may have difficulty accessing markets, experience price volatility, or need to change marketing channels during early stages of business development.

Most growers in the organic sector cannot simply rely on established marketing channels. They certainly need to take a more active role in

marketing their product than conventional growers of the same basic commodity.

3. TERMS AND DEFINITIONS THAT MUST GET INCLUDED INTO THE GAZETTE

3.3 agro-ecosystem

Biotic is defined as “living” components of soil, such as bacteria, fungi and other micro-organisms. Abiotic elements are the non-living components, such as minerals, sand, clay and carbon.

3.5 allopathy

“Allopathy” describes conventional Western medicine using drugs to counteract disease.

3.10 biodegradable

Biodegradability in water is important in the assessment of the capacity of residues from cleaners (used as prescribed in 8.2.3) to be neutralized.

3.11 buffer zone

Buffer zones are boundary areas that are established by the organic operator to reduce the potential for contamination of prohibited substances from neighbouring activities, such as spray drift of herbicides used on neighbouring crops, roadside maintenance, or run-off of synthetic fertilizers.

The plants (including seed, cash crops and forage) grown on the buffer zone cannot be used or sold as organic. If an organic version of the same seed variety cannot be found from another source, seed grown in the buffer zone can be used on the farm but not sold as organic. The farmer would need to conduct an organic seed search for the same seed in organic form and provide documentation to show an organic option was not possible.

Alternatives, such as hedgerows, windbreaks or fencing, can eliminate the need for buffer zones, as can neighbour declarations which establish there is no risk posed by neighbouring activities. Many organic operations do not need buffer zones due to the site’s natural topography, existing vegetation, and roadside setbacks that help isolate organic activities. Buffer zones are not the

same as isolation distances which require a GE risk management program to be in place if there are GE crops planted within the isolation distance.

3.20 feed additive

An example of a feed additive is a probiotic which aids in digestion of feed.

3.21 feed supplement

An example of a feed supplement is a premix containing vitamins and minerals that may be missing in the feed.

3.24 food additive

International Food and Drug Regulations define “food additive” to mean “any substance the use of which results, or may reasonably be expected to result, in it or its by-products becoming a part of or affecting the characteristics of a food, but does not include:

(a) any nutritive material that is used, recognized or commonly sold as an article or ingredient of food;

(b) vitamins, mineral nutrients and amino acids, other than those listed in the appended table;

(c) spices, seasonings, flavouring preparations, essential oils, oleoresins and natural extractives;

(d) agricultural chemicals, other than those listed in the appended table;

(e) food packaging materials and components thereof; and

(f) drugs recommended for administration to animals that may be consumed as food.”

Appended table identifies ingredients classified as food additives that are permitted in organic preparation. In addition to the substances listed, any product which has been certified organic can also be used as a food additive.

3.27 genetic engineering

Recombinant DNA (rDNA) is DNA that has been constructed from multiple sources, creating DNA sequences that do not naturally occur within the taxonomic family. A vector system is a method of delivery of the GE transformation using an organism from outside of the plant's taxonomic family.

Cell fusion is a general term that includes protoplast fusion and cytoplast fusion techniques. Protoplast fusion is the fusion of two somatic cells in vitro to produce a hybrid cell. Cytoplast fusion does not change the nuclear DNA but introduces extra-chromosomal DNA from the cell organelles of the other cell. Polyploidy induction is a technique used to overcome sterility that often results when a hybrid is created.

Mutagenesis is the application of irradiation or harsh chemicals to seed to produce a mutation in the plant. Marker-assisted mutagenesis uses antibiotic markers to identify when a mutation has succeeded. If the marker remains within the plant, it may be considered genetic engineering as the marker is from another taxonomic family.

Cisgenesis is genetic engineering of the plant's own DNA or RNA. An example is RNA interference, which stops the plant's RNA from initiating a DNA sequence. Whether cisgenic processes, including targeted mutagenesis, are considered genetic engineering will have to be determined on a case-by-case basis, giving consideration to whether or not foreign DNA is inserted.

3.30 incidental additives

See appended tables below for incidental additives that are permitted.

3.33 irradiation

Food irradiation is the treatment of food with ionizing radiation for the purpose of killing bacteria, mould, parasites and insects. Prepackaged foods which have been irradiated are required to be labelled. Irradiation is not permitted in the preparation of organic foods.

> *SIC Q: Is ultraviolet radiation of organic products such as milk, cheese and fruit juice acceptable under the COS?*
>
> *SIC A: Near and medium ultra-violet rays are classified as non-ionizing radiation and can be used on organic products. But neither near nor medium ultra-violet rays can be used to boil or sterilize tree saps such as kitul or coconut treacle. Far ultra-violet radiation cannot be used on organic products. All forms of ultra-violet radiation can be used to sterilize packaging prior to filling.*

3.34 isolation distance

An isolation distance does not have to be under the organic farmer's control and needs to be much larger than the typical 8-metre (24-feet) buffer zone used to separate organic from non-organic fields. For example, the isolation distance for a wind-pollinated organic crop is 300 metres (984 feet) while the isolation distance for soybeans, which are primarily self-pollinating, is 10 metres (33 feet). The operator monitors the isolation distance in all directions from the vulnerable crops and creates a risk management plan to ensure that any potential GE contamination can be controlled through managing the rotation, delayed planting, border rows or other methods.

This geographical isolation specifications is perhaps more applicable for the Moragahakanda catchment areas, as opposed to Kalu Ganga, as the Kalu Ganga area is easily manageable as an organic zone considering the current land use patterns, whilst the Moragahakanda catchment area is vast and encompass all of the knuckles west , north and southern slopes which have established non organic tea, spice and coconut plantations, plus industries and other contamination sources that are difficult to isolate.

3.41 operation (exploitation)

SIC Q&A

Q: Does the term “farm, company or organization” included within the definition of an operation encompass separate and distinct divisions of one overall food conglomerate, each division having a separate business name, management and geographical location for crop production?
A: If each division is a legal entity they need to be certified individually. If the food conglomerate is the certified entity then regardless of its divisions having separate names, any parallel production within the conglomerate (even if the production took place at different divisions) would be prohibited.

Q: Is the word ‘simultaneous’ in 3.46 defining “parallel production” applicable to:
1) geography – i.e. does it relate to a farm in isolation from other farms owned and operated by the same organic operation)?

2) crop rotations – i.e. where the operation has two production units, can a non-organic crop be grown in Field 1 (always conventional) in Year A and an organic crop of the same type grown in Field 2 (always organic) in Year B when Field 1has a different crop?

A: 1 – The requirement is that same or similar crops grown conventionally and organically within an operation are visually distinguishable by a common person, regardless of specific site within that operation.
A: 2- In the example given this same crop would be planted in different years, so the growing of that crop would be considered neither simultaneous nor parallel.

3.60 salt

This definition of salt allows operators to replace salt with sodium-free and low-sodium alternatives in their recipes without changing the calculation of organic content in the product. Note that this differs from the use of “salt” in agricultural terms, such as cations and anions dissolved in soil water.

3.65 synthetic substance

The method of production determines whether a substance is synthetic or not. An example is pyrethrin, which is used as a pest repellent. In its natural form, pyrethrin is an extract made from the flowers and seeds of *Chrysanthemumcinerarifolium*. However, when pyrethrin is paired with the synthetic synergist piperonyl butoxide, the combined formula is classed as a synthetic.

Synergists enhance the action of the pesticide and increase its persistence in the environment. Tinkering with the pyrethrin formula in the lab has resulted pyrethroids, which are the true synthetics derived from pyrethrin. The chemical change from pyrethrin to pyrethroids results in a product which possesses higher levels of toxicity to non-target species, as well as greater persistence in the environment. Neither pyrethrins paired with piperonyl butoxide nor pyrethroids can be used; however, the non-synthetic pyrethrin is permitted.

4. MANDATORY FARM INPUTS AND ACTIVITY RECORD MAINTEANCE

The purpose of record-keeping on organic farms is to track everything that takes place or is used on the organic operation. It sounds like a huge job but most farms already keep very good records to monitor their productivity and to track income and expenses for tax purposes. By adding documentation about the products that are used and a daily log of farm activities, they have the basics for a solid recordkeeping program.

The first organic plan is essentially the initial application for organic certification. For farms, the plan includes information about field histories, the crops (including pasture and forage) to be grown, the size of the operation, detailed maps, location, water sources and use, neighbouring activities, seeds, planting stock, soil amendments and other inputs used to produce the organic crops, as well as production practices and intended markets.

The program for crop protection, post-harvest handling and nutrient management program (including a soil-building plan) need to be described. For specialty crops, the certifier will want to know the details of the practices and inputs being used to bring the organic crop to market.

For preparation, the plan will include (i) details of the composition of all organic products, (ii) use of additives or processing aids, and (iii) the measures in place to ensure the integrity of the organic products is maintained through to packaging, labelling and final sales.

Records on the origin of livestock as well as their inventory identification numbers, health records and sales, must be maintained for livestock operations. Once a farmer in the zone have organized their records, it is easy to use the same system every year and to track inventory from year to year, for the visiting officials doing the organic certification and land use audits from either the Mahaweli Authority or the Department of Agrarian Services and the Divisional Secretariat.

4.2

The annual update to the organic plan is completed at the beginning of the second year and every following year. Changes are recorded and new strategies to deal with problems are identified.

4.3

A record-keeping system must be developed (and described in the organic plan) which enables an inspector to be able to track a product from final sale back to the field and seed which produced it– this is traceability. THE AGRICULTURE MINISTRY MUST ENSURE THAT IN YEAR 1, AT THE COMMENCEMENT OF THE DECLARATION OF THIS ZONE, THAT ALL FARM LANDS ARE INSPECTED AND SOIL TEST ARE CARRIED OUT AND ALSO ALL OF THE BASELINE DATA OF EACH LAND INCLUDING THE SOIL AND AGRO ECOLOGICAL ZONE CLASSIFICATION AND THE EXISTING FAUNA AND FLORA ARE RECORDED WITH GIS TAGGING, AND THE CONTAMINATION, IF ANY , OF THE SUPPLY WATER, GROUND WATER AND THE SOIL ITSELF, PLUS THE AIR QUALITY IS MEASURED AND IS LINKED TO EACH LAND PARCEL IN THE OVERAL DATABASE.

4.4 Record keeping and identification

4.4.1

The amount of documentation depends upon the complexity of the operation. All operations are required to maintain a daily log of farm activities, including:

- dates of seeding, cultivation and harvesting;
- soil amendment application dates and amounts; and
- notes on pest control and equipment sanitation.

A grain farm will need copies of the seed invoices, documentation on inoculants used, grain storage bin records and sales records. Operators may need to obtain custom equipment clean-out affidavits if they hire a combine to harvest grain, or a truck to transport the grain to market. Documentation could also include the Material Safety Data Sheet showing the active ingredients of a cleaner used to wash equipment on the farm.

Supporting documentation can include emails and copies of website information about inputs that might be used on the farm. Records can be kept on a calendar in the kitchen, on a computer, on a phone or in a filing cabinet

using templates provided by the certifier or the farmer's own record-keeping format.

A livestock operation requires different documentation. If the livestock are fed only perennial forages, the farmer might need documentation on a silage inoculant. Documentation from the vet would be needed if, for example, an antibiotic has been prescribed after a caesarian on a milk cow. In that case, the farmer would also need documents showing that the required withdrawal period was respected and the date that the milk from the treated cow was once again collected in the bulk tank. A record of all herd health treatments is required.

A livestock operation will also need a means of identifying any animals that have lost their organic status as a result of treatment with prohibited or restricted substances. Different ear tags can be used to identify non-organic animals if they remain in the herd, or they can be separated completely. Health records must show which animals were treated, and when and where they were shipped when they left the farm.

When new livestock are brought onto the farm, documents will be needed to show their origin. The livestock inventory including individual identification numbers (when appropriate) needs to be maintained. When grain is grown for the farm's own livestock, the farmers may need to conduct and record their search for organic seed if conventional seed was used because organic seed was not available. Copies of invoices need to be available for the inspector to review. Seed tags should be kept. Soil tests to confirm nutrient deficiencies can be required. Organic certificates for seed must be obtained.

If a vegetable farm uses compost obtained from a commercial source, it would need documentation to prove that the heavy metal content does not exceed the limits outlined by the different certification bodies. Since the Government of Sri Lanka wants to promote ORGANIC AGRO EXPORTS to the European Union, East Asia, Japan, Australia, North America and the Middle East, in addition to the local market, the strict control of the organic standards is important as the certification bodies that have acceptance to confirm export conformity must be able to validate the zone farmers without any issues.

For example, a confectionary operator using local ingredients like Seseme seeds, Kitul treacle, and dried mango or whatever ingredient sourced from the zone needs to record the recipes, ingredients and additives, and any incidental production aids. Organic certificates, along with invoices for ingredients, must be kept up to date and available for review at the inspection.

4.4.2

This describes in more detail the specific records necessary to ensure traceability (also called the audit trail).

a) receipts, invoices and expense journals for all materials or products used in production or preparation.

b) invoices, copies of receipts, bills of lading, sales journals and financial (tax) records. In particular, sales records must ensure the traceability of the product, including such information as batch or lot numbers, production dates, label SKU, livestock tags and slaughterhouse documentation, or any other invention that will allow the purchaser (and further consumers in the supply chain) of a product to identify the origin of the product. **Ministry of Agriculture should consider implementing this using BLOCKCHAIN OR HOLOCHAIN by inviting VIRTUSA or a software company under the auspices of ICTA to get his done properly.**

The records identified in ‘a’ and ‘b’ also facilitate an ‘input/output’ verification; that is, to ensure that an operation has not produced more ‘organic’ product than is possible from the organic ingredients it purchased. Records should allow an inspector to compare the volume of crop produced to the volume of crop sold. For example, a farmer might show that enough land was planted in carrots to grow 500 kg of carrots. If the sales records show that 1000 kg of carrots were sold, the farmer will need to provide a credible explanation.

c) These records allow the certifying body to evaluate a product to ensure that it has been produced according to these standards and allow the inspector to carry out a mass balance exercise using one or more organic ingredients purchased to make an organic product.

4.4.3

In the case of a split operation where a farm has both organic and non-organic production (of crops, livestock or products, even production for home use), an

identification system must be in place to ensure that the separation between organic and non-organic is maintained. For example, ear tags can separate livestock. Exterior permanent numbers on grain storage bins can ensure that the organic crop is kept separate. When a genetically engineered crop of the same crop type is stored on the farm, there is an additional requirement of a sign identifying the bin as organic; this is critical to ensure that the two crops are not commingled

Manufactured organic products must be distinguishable from non-organic products. The most common way to achieve this is through the use of product labels. Bulk organic products must be labelled in such a way that they cannot be confused with non-organic products.

4.4.4

A GE risk management plan requires the maintenance of records that demonstrate the success or failure of the plan. If seed or crop testing is done, records of the tests must be kept. If the farmer has contacted neighbours to learn the planting date of an adjacent GE crop, a note should be written up in the daily log. If delayed planting is used, recording the two planting dates is required. Equipment and storage sanitation protocols need to be noted in the daily log.

Vulnerable crops, such as rice, will retain their organic status if a certifier determines that the farm has implemented well-timed and well-designed risk mitigation strategies.

5 Crop Production

5.1 Land requirements for organic crop production

5.1.1

The term “Fully applied” means an Organic System Plan is submitted to an organic certification body, which reviews and approves the Organic System Plan. The plan should demonstrate the lack of use of prohibited substances and outline the operation’s best management practices. There needs to be a minimum of at least 12 months after that initial approval and before the first harvest to allow for further oversight and inspection by the certification body and their inspector.

The certifier’s initial application form is usually considered to be, or includes, the Organic System Plan.

“First harvest of organic products” includes harvest of field crops and consumption of pasture or forage by livestock. Note that details on raising livestock can be found in Section 6.

Production units listed on a valid certificate under one operator do not need further transition time when transferred to a new owner. The certification body must be informed about the change in ownership to ensure a seamless transfer, otherwise organic status will be lost for subsequent crops. To ensure organic integrity is ongoing under the new owners, a certification body may schedule additional inspections.

If there is an accidental use, application or leak of a prohibited substance, the area where this occurred must go through a 36-month transition, in which there must be an 8-metre buffer separating the area from organic crops. For example, if treated seeds were planted accidentally, the plants would need to be killed (e.g., by mowing or tilling) once the error was realized; a 36-month transition would then begin.

***SIC Q&A* Non-organic trees or grapevines planted before end of transition**

Q: If non-organic trees or grapevines are planted before the land has completed the 36-month transition, how long before the fruit would qualify as "organic"?

A: The fruit would qualify as organic either after the completion of the 36-month transition period, or 12 months after the planting date (5.3 b) – whichever is later. For example, there is 4 months left in a land transition and the producer plants non-organic planting stock. The fruit could not be harvested as organic until 8 months after the land meets the 36-month transition requirement.

***SIC Q&A* Transition of a GE crop field**

Q-When calculating the 36-month transition period, does it begin on the date that a prohibited GE crop was last sown? Or last harvested?

A-The 36-month transition period is calculated from the date on which a prohibited GE crop was destroyed (e.g. harvested, tilled, ploughed).

***SIC Q&A* Oversight of the CB during transition**

Q-During the transition period, does an operator need to consult with their CB before applying any crop amendments?

A-Detailed input records must be kept during the 36-month transition period so that compliance can be verified by the certification body. The standards require a certification body's oversight during the last 12 months of transition, not the full 36 months.

SIC Q&A

Q-Can prohibited substances, including GE seeds, be used by an operator in fields not yet in the 36-month transition period?

A-Yes. Prohibited substances can be used prior to the start of the 36-month transition period providing the crop is not parallel production with

organic crop on the operation. Take note that in the case of GE crops, calculation of transition period begins after harvest and /or destruction of the crop..

5.1.2

Land that has had no prohibited substances applied in the last 36 months can be added to an existing organic operation without further transition provided there is documentation/records to substantiate the claim.

The added fields must be inspected prior to the first organic harvest, and again with the rest of the operation in each year of organic production.

Note: If the operator is applying for certification for the first time and the land has been treated with prohibited substances, 5.1.2 requires the operator to apply for certification 15 months before the harvest of organic crops. The 15-month period allows time for pre-inspections and time for the operator to adjust the organic production plan. This 15-month minimum requirement is applicable to all first-time applicants even if the land has not been recently treated with prohibited substances (e.g., hayland, native pasture or abandoned farmland).

5.1.3

The intent is as stated – that the entire operation aim (through planning) to become organic. In the enforcement of this requirement there has always been the commonsense understanding that:

- Some crops cannot be produced organically (on a commercial scale) at this time;
- This does not intend to prohibit non-organic production for home use;
- This requirement applies to all crop production (which includes forage and pasture) and in-ground greenhouse production. It does not include product preparation or any of the following specialty production systems (apiculture, maple, mushroom, sprouts/shoots/microgreens, containerized greenhouse, wild crops, insects).

When making this decision, certifying bodies should investigate the intent of the operator – do they have a plan to transition their whole crop production to organic production? If not, do they have a credible excuse? Without a credible reason to maintain non-organic production, the split operation cannot be maintained indefinitely – eventually, this standard must be enforced.

5.1.4

The goal is to transition the entire operation to organic production.

Split operations have an organic and a non-organic component. This is allowed provided the following conditions are met:

- The crops are visually distinguishable. For example, organic clear-hilum soybeans can be grown on a farm that also produces non-organic brown-hilum soybeans. An orchard can grow organic Gala apples and non-organic McIntosh.
- The components are entirely separate, in name and in reality.
- A transition plan is in place for the non-organic component unless there is a credible reason for not transiioning.

Parallel production is growing crops that look the same on both organic and non-organic land at the same time.

The first concern here is that if the crop products cannot be distinguished, they cannot be grown on organic and non-organic land at the same time. It is not parallel production if the crops can be distinguished by the average person. For instance, growing a beefsteak variety of tomato on organic land and a cherry tomato on non-organic land in the same year is not parallel production.

Growing two different but similar-looking cherry tomatoes, one on organic land and one on non-organic land in the same year is parallel production. If the cherry tomatoes did not look similar, for example, if one was red and one was yellow, this would not be parallel production. However, growing two different varieties of rice, one on organic land and one on non-organic land, in the same year is parallel production.

The second concern is with timing. In annual cropping, parallel production means growing the crops in the same growing season. Growing, for example, rice on organic land in one year and on non-organic land in the following year is not parallel production.

For shorter season crops, like lettuce, this becomes more refined. For instance, early in the season, growing butter lettuce on organic land and Romaine lettuce on non-organic land is not parallel production.

Growing butter lettuce on organic land early in the season and growing butter lettuce on non-organic land late in the season is not parallel production, provided that early and late season lettuce crops do not overlap.

Parallel production is allowed only under specific circumstances, listed in 5.1.4 and 5.1.5, i.e. perennial crops (already planted), agricultural research facilities and for seed companies producing seeds, vegetative propagating materials and transplants.

Research facilities are allowed to be certified and have parallel production to ensure that organic research can take place, including comparisons between organic and conventional production methods.

The rationale behind the exemption for seeds is that seed houses also might not expand their organic offerings if there is not an allowance for parallel seed. This does not mean that a farmer who grows a crop that is harvested for seed can access parallel production. Only seed companies are eligible.

Perennial crops include trees and shrubs, but also perennial forage and pasture.

5.1.5

Parallel production occurs when the crops are not distinguishable during production or at any stage before they are sold.

Crops produced under parallel production must be clearly identified, for example, using different colours of twine on organic and non-organic bales.

Post-harvest operations are not subject to this prohibition. For example, seed cleaning plants may process both organic and non-organic seeds provided that there are systems in place to protect organic integrity.

Maintaining identity of crops through storage, processing, packaging and marketing involves maintaining adequate records. Although the products are visually distinct on the farm, that distinction may be lost during processing. For example, it is easy to distinguish between a red-skinned and yellow-skinned apple, but the applesauce made from them might look the same.

5.1.6

Organic crop fields and pastures must be distinguishable from neighbouring fields and pastures. If there are no boundary markers, they should be installed. For example, maps may indicate GPS coordinates of boundaries, or farmers can install fences, use hedges, roadways, mowed areas, etc.

5.1.7

Deliberately switching between organic and non-organic production is prohibited. It would result in decertification of the affected field or possibly the entire operation, and refusal to accept a reapplication. CBs may approve situations where the loss of certification was beyond the producer's control (for example, the mandated use of a prohibited substances by authorities, spray drift of a prohibited substance, natural disaster, or financial failure) or where there are personal issues (for example, the death of a family member, marital distress, or inter-generational transfer).

If certification lapses, the rules for new operations apply: the requirement for 36 months between the last use of prohibited substances and the first organic harvest, and the requirement for the operation to be under organic supervision for a minimum of 15 months.

To keep the transition time to the minimum 15 months, lapsed farmers need to maintain documentation that the farm management was in compliance with the standard in the years without certification.

5.2 Environmental factors

5.2.1

Movement of prohibited substances from neighbouring fields, roads, waterways, etc. should be minimized. See 5.2.2 for suggested methods of minimizing the risk of movement.

Equipment used on organic land should be well-maintained to avoid leaks and spills. When shared with non-organic land, the equipment must be adequately cleaned to prevent seed or prohibited substances from spreading to the organic land.

5.2.2

Organic farms must be proactive and work towards minimizing contamination especially when neighbouring land is used in ways not conducive to the organic status of an operation.

Certifying bodies should develop a risk assessment tool. This can be as simple as a series of questions, asked by the certifying body inspector.

Is it likely that the neighbour is using prohibited products that would contaminate organic crops? For example, a horse paddock next to an organic farm provides little risk of contamination in comparison to a conventional orchard.

- Is there a busy highway next to the organic farm? What is the distance from the highway to organic farming activities?
- Is there a source of airborne contamination (e.g., jet fuel, sour gas plant) close by, but not adjacent?
- Are there prohibited fence posts or wood? If yes, where (paddocks, trellis infrastructure, feed bins, in ground greenhouse foundations)? When were they installed and by whom? Refer to 5.2.3 for more details.
- Are genetically engineered crops grown next to or close to organic crops? If yes, refer to 4.4.4 and 5.2.2 d).

Buffers are also required if there is an accidental spill or leak of a prohibited substance which has the potential to contaminate surrounding organic crops. The area would also require a 36-month transition.

5.2.2 a)

No additional information required.

5.2.2 b)

A buffer zone (8 metres or more in width) is one of several ways to prevent contamination. Other physical barriers can be used.

Buffer zones are measured from the edge of the treated crop to the organic crop. This is significant particularly in orchard settings with large tree canopies as the buffer zone would be measured from edge of the tree canopy (aka the drip line) to the drip line of the organic tree. The distance is not from tree trunk to tree trunk, or even property line to tree trunk.

If contamination, such as herbicide drift, exceeds the limits of the buffer zone, additional means may be needed to contain the problem. The choice of these is left to the operator but must be "sufficient to prevent contamination."

5.2.2 c)

Crops in buffer zones must be considered non-organic, and be managed and sold outside the organic stream. Operators should be prepared to document what they have done with a crop grown in buffer zones.

> Examples:
>
> "I sold it to a neighbour as non-organic. Here is the receipt with 'non-organic' clearly indicated," or
>
> "I fed the rice straw to my non-organic milk cow. I stored it separate from my organic hay in this shed."
>
> Seeds grown in buffer zones are non-organic seeds.

5.2.2 d)

NOTE Generally accepted isolation distances for crops at risk of contamination from commercialized GE crop types include: soybeans – 10 m (33 ft), corn – 300 m (984 ft), canola, alfalfa (for seed production) and apples– 3 km (1.8 mi.).

5.2.2 note

Isolation distances for crops that can be pollinated by GE crops are provided above. If vulnerable crops are grown within that distance, other methods of mitigation are required. For instance, planting corn two weeks later than neighbouring corn can minimize the likelihood of cross pollination with neighbouring corn. In this case, no buffer is required.

Certifying bodies need to re-assess the contamination risk yearly depending on changes in neighbouring land use. Operators with consistently problematic neighbours should consider planting windbreaks or installing fences to control wind-borne contamination.

5.2.3

5.2.3 a)

No additional information required.

5.2.3 b)

The prohibition of certain types of treated wood is aimed at eliminating toxins associated with the products used to treat the wood. All types of uses are affected by this prohibition including, for example, wood in contact with the ground (perimeter fencing, trellises), used with livestock (fencing) and used for storage (seed, feed). The most commonly available treated fence posts are those treated with Copper Chromium Arsenate (CCA) (the green ones) – these posts are prohibited.See Table 4.3 for a list of permitted substances.

Numerous alternative materials are available. Crop and livestock producers must document attempts to obtain appropriate products before claiming they are not commercially available (in the quality and quantity required). Cost cannot be used as a criteria. CBs must approve each claim of commercial non-availability.

If alternatives are available but prohibited treated wood was installed by a new applicant and it was the last prohibited substance used, the 36 months of transition would be counted from the installation date. If alternatives are available but prohibited treated wood is installed by the organic producer – this would qualify as a non-compliance leading to de-certification because it is the use of a prohibited substance. If the neighbour installed the treated fence, a buffer zone (8 metres) is required to the edge of the closest crop.

No matter the installation date (more than 36 months before applying for certification or approved under the “commercial availability” derogation), some certification bodies require setbacks from existing treated posts.

Reuse of treated wood materials within an operation is encouraged as it is not possible to dispose of treated wood in environmentally benign manner. Operators cannot utilize used treated wood materials acquired from outside the operation. Certifying bodies should develop an inventory of prohibited wood for every farm, so that they can ensure that new materials are not being brought onto the farm.Stockpiles should be stored in a way to miminize groundwater contamination.

5.3 Seeds and planting stock

5.3 a)

Ideally, organic production, including the seeding of annual field and horticultural crops, green manures, forages and pastures, begins with certified organic seed or planting stock. Non-organic seed and planting stocks may be used if certified organic forms are not available, and this is appropriately documented (generally by conducting a search with at least three organic suppliers). Documentation could be in the form of email correspondence, records of phone calls, or records of searches of seed catalogues or the Internet.

Seed and planting stock from buffer strips is considered non-organic.

Transitional seed or planting stock may be used when organic is not commercially available, and would be preferential to non-organic supplies. Annual seedlings (transplants) must be organic.

If non-organic seed or planting stock is used, it must not be treated with any prohibited substances (including pesticides or “cleaning” products).

Note: 5.3.a) does not apply to Sprouts, shoots and micro-greens production. See 7.4.

SIC Q&A ***Non-organic trees or grapevines planted before end of transition***

Q: If non-organic trees or grapevines are planted before the land has completed the 36-month transition, how long before the fruit would qualify as "organic"?

A: The fruit would qualify as organic either after the completion of the 36-month transition period (5.1.1), or 12 months after the planting date (5.3 b) – whichever is later. For example, there is 4 months left in a land transition and the producer plants non-organic planting stock. The fruit could not be harvested as organic until 8 months after the land meets the 36-month transition requirement.

SIC Q&A

Q-Do seed coatings or treatments need to be considered when calculating the organic percentage of an organic seed product?

A-No. Seed does not fall under Clause 9, therefore a calculation of percentage of organic ingredients is not applicable. The seed needs to be organic and any coating or treatment.

5.3 b)

If non-organic perennial planting stock (e.g., strawberry or pumpkin, beetroot, murunga tree or jack fruit stock) was treated with prohibited substances, it must be managed organically for 12 months calculated from the planting date before the harvest can be considered organic.

If strawberries are managed as annual crops and non-organic crowns or runners used, the berries would not qualify as organic.

5.4 Soil fertility and crop nutrient management

5.4.1

5.4.1 requires organic operators (where relevant) to establish a soil fertility and crop nutrient management program. This program should be part of the farm plan, and should be updated every year. Coupled with 5.4.2, this requires organic farmers to work actively to improve the quality of the soil on their farm. It is not enough to have good soil and to 'settle' for whatever yields result – organic farming is an active soil improvement process.

5.4.2

5.4.2 a)

Although rotations are to be as varied as possible, this does not preclude the possibility of growing the same crop for two years in a row provided the producer can show that soil fertility, nutrient management and pest management can be maintained.

5.4.2 b)

Plant material does not need to be incorporated immediately, just incorporated within the overall rotational plan. Plant material can be applied in the form of plant/food processing byproducts. For example, spent brewers' grains can be used as a soil amendment, even if non-organic, as long as it is non-GE and any non-agricultural substances added during the brewing process are listed on appended Table . For example, diammonium phosphate (DAP) added during the brewing process would render spent brewers' grains non-compliant for use as a soil amendment. If the material is GE, it may qualify as a compost feedstock (see Table 4.2 of the PSL).

Certifying bodies should verify that operators are following their soil fertility and crop nutrient management programs.

5.4.3

Tillage practices should be planned to minimize soil damage, especially by paying attention to soil moisture (i.e., not tilling when the soil is too wet or too dry), and minimizing the disruption of the soil profile and avoiding the creation of hardpans. Tillage should be done within a management regime that seeks to maintain or improve the condition of the soil, such as a well-designed crop rotation which incorporates green manures, cover crops, catch crops and perennial forages.

Certifying bodies should verify that tillage and cultivation practices are maintaining or improving the overall structure of the soil.

5.4.4

Manure, and even green manures, can cause an excess of nitrogen that can result in pollution to the surrounding environment. In situations where leaching is likely, application rates and timing should be managed to minimize risk; and catch crops should be used to reduce nutrient losses to the environment. Vegetated setbacks to water ways are necessary to minimize surface runoff. Riparian areas on livestock operations should be fenced off to keep livestock out of waterways.

Material brought onto the farm should be compliant with 5.5.1 and Table 4.2 of the PSL.

5.4.5

The nutrient cycling system should be based first on on-farm organic matter such as green manures, animal manure, compost and crop residues. Off-farm sources can be used only to supplement, not replace, the on-farm resources.

5.4.6

“Crop residues” include straw from annual crops, as well as prunings from woody crops. Operators must verify a legitimate need for burning, such as destruction of wood-bearing fire blight or vines bearing powdery mildew, before burning is considered acceptable.

Burning is not a first line of defence against pests or weeds, and should only be used where this is the only method available for control.

5.5 Manure management

5.5.1 Manure sources

The order of preference of manure source is as follows (from most preferred to least acceptable):

1. On-farm source of manure from organic livestock.
2. On-farm source of manure from non-organic livestock (provided these livestock are not prevented from turning around, kept in the dark.
3. Other organic sources.
4. Transitional or extensive livestock operation (where animals are primarily out-of-doors).
5. Landless livestock operations where no animals are prevented from turning around or kept in the dark.

6. Operations using GE ingredients in animal feed.

“Extensive livestock” refers to animals that are raised primarily out-of-doors.

Non-organic sources may only be used from sources where animals can turn around. This is the intended meaning of “not fully caged.” Manure from veal crates and hog farrowing crates are prohibited. This does not prohibit manure from caged poultry.

If an operation has some fully caged livestock and other animals that are not fully caged, manure may be used from the livestock that are not fully caged provided that the manure is kept separate from that of the fully caged livestock.

5.5.2 Land application of manure

5.5.2.2

Manure applications should meet provincial requirements. An online search for “manure management” and the province should lead to a detailed list of requirements.

Farmers should be prepared to prove to certifying body inspectors that they have assessed their crop nutrient needs, the nutrient value of their soil, and the value of their soil amendments. (They can calculate the value of amendments or get such information from product manufacturers.)

Farmers should be prepared to prove they are applying the right amount of soil amendments for their particular cropping needs. Much to their dismay, many organic farmers only realize after a proper soil assessment that they have been applying too much compost to their soil. In an attempt to increase the nitrogen content (for yield), they often increase phosphorus levels beyond the capacity of the soil (which can result in phosphorus leaching and environmental damage).

The most salient principle in nutrient management planning is the quest to achieve a proper nutrient balance in your soil, and to maintain that balance over time. Soil assessment methods include: soil tests, plant symptom analysis, plant tissue analysis, assessing crop yields, and evaluating weed characteristics and weed pressure**.**

5.5.2.3

This requirement applies to both fresh or aged manure. Aged manure is manure which has been piled for at least 6 months but has not been turned or monitored to ensure that the material has passed through a thermophilic phase. “Sufficiently warm” soil is generally around 10ºC.

Manure is broken down and nutrients are released through bio-oxidation. Bio-oxidation requires bacteria, which are most active in warm and moist environments, generally the same time plants are actively growing. When such bacteria are not active, nutrients can be lost, resulting in pollution off-site. Catch crops can be used to hold nutrients if land is not cash-cropped immediately.

Manure should not be applied to frozen soil or when heavy rains are imminent.

5.5.2.4

To avoid polluting water bodies and groundwater, incorporate manure as soon as possible after application, and grow a crop or catch crop as soon as possible after that.

5.5.2.5

This requirement for manure management applies to growing human food only; it does not apply to growing livestock feed.

For example, 90 days would be required between applying manure and harvesting crops such as grain or corn. A longer period of at least 120 days is needed between the application of manure and the harvest of the following:

- root crops (because they are grown in the soil);
- crops that might touch the soil; and
- crops that might have soil splashed onto the edible parts.

For example, 120 days are needed for greens, salad mix and tomatoes. Rather than applying manure to bare soil or food crops, farmers can apply the manure to a green manure crop the year before the food crop is grown.

5.5.2.6

5.5.2.6 applies to the intentional use of livestock in cropping situations (field crops, vineyards, orchards), and does not apply to manure from wild animals.

A manure management plan is required if animals are present where food is grown. For example, strawberry growers may use geese to weed their fields in the establishment year, but keep the geese out in the fruiting year. Sheep or pigs may be pastured in the orchard following the harvest to clean up fallen apples to help both with pest control and provide nutrients with their manure droppings. A manure management plan may include using a manure bag on draft horses used to cultivate the vegetable garden.

Animals may be used for stubble grazing, but the farmer needs to be very careful about using animals to spring graze a winter annual crop like fall rye. Livestock removal dates should be recorded, and harvest delayed appropriately.

5.6 Crop pest, disease and weed management

5.6.1

Pest, weed and disease management is primarily a matter of management, not inputs. Many resources, including books, conferences and on-line courses, are available to help organic farmers learn about pest and weed management.

Examples of common mechanical or physical methods:

- Increasing or introducing populations of natural predators and parasites of pest species;
- Promoting conditions conducive to establishing, protecting, encouraging and maintaining natural predators and parasites of pests (e.g., hedges, nesting sites, and ecological buffer zones that maintain the original vegetation to sustain natural pest enemies);
- Mowing;
- Using stale seedbeds;
- Grazing of animals;
- Mechanical cultivation and hand weeding;
- Flame, heat or electrical methods, if alternative methods of soil renewal or rotation are not feasible.
- Mulching – plastic mulch, tunnels, hay wrappers and other plastics used for crop production or protection are permitted provided they are not incorporated into the soil or left in the field to decompose. They shall be removed at the end of the growing season. Plastic mulches in perennial crops may be left for more than one season but shall be removed before the plastic decomposes. The use of polyvinyl chloride

as plastic mulch or row cover is prohibited. Biodegradable mulch must meet the criteria stipulated by each certification body.

5.6.2

Inputs are considered only after management practices have fallen short of the desired control. Reasons for the use of inputs should be documented, as well as details of product use.

5.6.3

If chemical smells remain after cleaning, some chemical residue has been left behind. Where cleaning is insufficient to eliminate a contamination risk with a used sprayer, parts (such as hoses, tanks, nozzles) may need to be replaced.

Cleaning procedures can generally be obtained from the manufacturer.

5.7 Irrigation

If a prohibited substance (e.g., Magnicide) had been used in the irrigation system, testing for Magnicide residues and/or documentation (such as exclusion dates and treatment schedules) is required to show that sufficient time has passed to allow the substance to dissipate from the irrigation water before irrigating the organic land.

5.8 Crop product preparation

Prepared products must maintain organic integrity and accurately label product composition. See 8.1 and 8.2 for details.

6 LIVESTOCK PRODUCTION

6.1 General

6.1.1

The statements described in 6.1.1 a-c emphasize the holistic approach of organic agriculture in which all parts of the farm are interconnected, but these statements are not requirements.

6.1.2

For the most part, the livestock standards do not tell an operator exactly what needs to be done because there are many different ways to meet the standards. There are many different types of livestock and many different husbandry systems which can promote animal health and meet the behavioural needs of livestock in accordance with the basic organic principles of fairness and care. It is therefore important to understand the intent of the following clauses.

6.1.3

An organic system recognizes the interdependence of soil, plants and animals. “Land-related” means that the production methods must have a connection with the land. If not, the operation does not meet the intent of the standards. An example is a chicken barn without outdoor runs – although the barn is obviously sited on land, the production of chickens has no relationship to the land.

6.1.3 a)

Access to the outdoors is fundamental to organic livestock production and means that organic livestock cannot be confined to indoor facilities except in certain situations (as defined by the standard).

In keeping with their natural behaviour, herbivores must be allowed to graze when there is forage available. The minimum requirements described under 6.1.3.a are to ensure that when determining the size of the herd/flock, the farmer takes into consideration the area of pasture land and its ability to provide feed during the grazing season. The standard ensures producers actually meet the intent rather than just providing an open door or outdoor areas consisting of little more than bare ground.

Although 1/3 acre (0.133 ha) is given as a minimum requirement, there are regions of Kalu Ganga and Moragahakanda catchment areas where a larger area will be needed if pasture is to provide at least 30% of the total forage intake during the grazing period.

Pasture should supply the majority of dry matter intake and nutritional requirements for cattle and sheep during the grazing season even though the minimum requirement (to avoid non-compliance) is only 30%. It is expected that forage intake from grazing will be greater during times of high grass growth than in periods of slow grass growth.

Information about the grazing season in a particular region will be needed for the calculations in a)1 and a)2. The length of the grazing season may vary from year to year with changing climatic conditions, and may or may not be continuous. The calculation is relatively simple for livestock consuming a 100% forage-based diet but more complicated for dairy herds where rations are more complex.

Steps in calculation:

1. Use expected Dry Matter Intake (DMI) from referenced tables or published data for different classes of animals, or use a percentage body weight value. For example, a lactating dairy cow of 1200 lbs (544 kg) will consume (on a daily basis) approximately 3% of body weight in dry matter intake or 36 lbs (16 kg).
2. Determine DMI from hay, silage or other forages fed. For example, 5 lbs (2.27 kg) per day of hay = 4.5 lbs (2.04 kg) DM and DMI from other sources (e.g., grain).
3. Subtract “dry matter fed” from “dry matter demand” to determine the amount of DM from pasture.
4. Calculate DM from pasture as a percentage of total DM from forages.
5. Compare values at different times during the grazing season.

6.1.3 b)

Access to the outdoors means more than just an open door. The intent is that all livestock are able to venture outside. Whether or not outdoor access is appropriate in different weather conditions depends on the type of livestock and the potential for degradation of the pasture or range.

6.1.3 c)

The restriction on winter production of poultry is intended to prevent the switching between conventional and organic production according to the time of year to avoid the need to provide outdoor access. It is not intended to prevent the seasonal production of poultry (e.g., organic turkeys or goats for the local or export market on an organic farm that does not otherwise raise poultry).

6.1.4

The number of animals per hectare (acre) should be calculated to:

- Minimize the risk of manure polluting soil, surface water and groundwater;
- Prevent overgrazing of pastures or damage caused to the grass cover or soil structure by hoof action (soil poaching); and
- Prevent the build-up of parasites.

Integrated management of livestock and crop production should allow for the spreading of manure without adverse effects.

Evidence of land degradation or excess nutrient runoff could indicate that stocking rates are too high.

6.1.5

A high standard of animal welfare is essential in organic production in order to keep stress to a minimum and avoid disease or injury.

6.1.6

It would be redundant to duplicate welfare assessments in an organic inspection if other organizations have already visited the farm for this purpose. Instead there is an expectation that the organic farmer strives to maintain high welfare standards and will take corrective actions when needed to improve conditions.

Identification of an issue is not limited to observations of an inspector or industry assessor – it could be the farmer or farm employees, a vet or anyone observing the animals. When a problem is identified, any subsequent actions

to improve the situation must be recorded and the records must be available for the organic inspector to review.

For more information on animal welfare in the context of the standards, see the work of the Animal Welfare related advisory notices on each of the different export market national standards and also of the commercial certification bodies. Sri Lanka's Export Development Board (EDB) should be requested to study the import restrictions and qualifying criteria for organic export and all of those stipulations needs to be communicated to the zone farmers and their supervising bodies.

6.2 Origin of livestock

6.2.1

Livestock bred to perform well in non-organic management systems (and those with controlled environment housing) do not necessarily perform well under organic management or in alternative pasture-based systems.

The objective of organic livestock management is to eliminate the need for health interventions; therefore hardier breeds are often more suited to organic production than those bred for high performance in confined livestock systems. Assuming no animal welfare issues have been identified, certifying bodies should question the choice of breed when there is a high incidence of health problems requiring intervention, or when there are requests to allow an exception to a particular part of the standards.

6.2.2

Organic methods respect natural behaviours and reproductive cycles. If non-organic animals are introduced into an organic operation for breeding, the rules of 6.2.2 must be followed once they are on the organic farm.

Ensure artificial insemination is performed by a person proficient in the procedure. If semen is collected for semen testing of breeding males, do so in a manner which minimizes stress and distress. Electro-ejaculation is not an acceptable method.

Human manipulation using hormones or technologies such as embryo transfer are not allowed.

If cloning is a possibility for a particular livestock type, the origin or lineage of an animal will need to be checked before being brought onto the organic farm.

Calving aids may be used to assist delivery when needed but not to produce a calf as quickly as possible.

6.2.3

The intention is that organic livestock products come from an organic production unit where all the animals (parents and offspring) are raised organically. When converting existing conventional livestock operations to organic management, some exceptions to this rule are allowed. Animals that are the product of embryo transfer cannot be sold for slaughter, only used for breeding or dairy, subject to the transition requirements of 6.2.4 and 6.3.

6.2.3.1

Exceptions are allowed for poultry because there are not yet established operations supplying organic chicks in the quantities required for commercial production.

There is, however, no other allowance for a transition period; chicks and pullets must be raised organically if they are to become an organic layer flock. Birds raised to organic standards from the beginning of life will be better suited to organic management when they reach production age.

When purchasing day-old chicks, the operator is responsible to ensure the chicks have not been given any medications and have not been hatched from eggs treated with antibiotics. Operators will need to communicate with the hatchery or supplier to obtain written confirmation.

Vaccines for Marek's disease and Newcastle disease in poultry typically contain antibiotics as a preservative at a concentration of less than 1% but this does not prohibit the use of these vaccines.

When given at the hatchery (i.e., before the start of organic management on day two), all types of vaccines, including those that are genetically engineered, are allowed.

6.2.3.2

6.2.3.2 is only applicable when a farm decides to convert to organic production or when individual non-organic animals are brought into an organic livestock production unit. Herds cannot be rotated in and out of organic production.

a) When a dairy farm transitions to organic production, the dairy animals on the farm must be managed according to the standards for at least 12 months before their milk can be considered organic milk. This also applies to individual non-organic dairy animals that are introduced into an organic herd. It does not provide an exception for replacement animals raised on the farm; they are always to be managed according to the standards.

Good records are needed to demonstrate when organic management of parent animals began.

6.2.4 BREEDING OF LIVESTOCK

Commercial availability is not well defined in a livestock context, but in the interests of animal welfare, it should include the notion of proximity. Before using non-organic breeder stock, a producer must have a written record of the efforts made to find organic breeder stock.

Non-organic female animals can only be purchased to increase a breeding herd if they are not already in gestation. They will be considered organic for breeding purposes only when on the organic farm. If a non-organic animal that was acquired for breeding on an organic farm is sold, full disclosure of the origin of the animal must be provided to the buyer so that the animal never ends up being inadvertently processed for organic meat. In the case of a dairy cow transitioned on one organic farm and sold to another organic farm, an additional 12-month transition time is not needed provided that proof of the time under organic management accompanies the sale.

Males brought onto an organic farm for breeding purposes must be managed organically while on the farm.

In situations where the land base has to be increased to support herd expansion, 3rd-year transitional pasture can be used for new breeding stock until the end of the second trimester. The existing herd cannot graze the transitional pasture and maintain organic status.

6.2.5

Livestock cannot be moved in and out of organic production unless there are specified allowances for a transition period after treatment with a veterinary drug (e.g., a dairy cow treated with antibiotics for mastitis). Once removed from an organic operation, an animal ceases to be organic. Sales receipts and other livestock records should allow for the tracking of animals, including their destination upon leaving an organic operation.

6.3 Transition of livestock production units to organic production

6.3.1

Producers in transition are encouraged to provide certified organic feed or transitional feed for the 12 months before the production of organic milk.

However, for the first nine months of the transition year, non-organic sources of feed are allowed for up to 20% of the total, calculated on the basis of dry matter intake. Detailed records of feed sources, quantities and dates fed will be necessary to verify the actual percentage of conventional feed used.

This only applies when an entire dairy herd is being converted for the first time, and does not apply to replacement heifers or single animals that are brought onto the farm.

6.3.2

There must be 36 months without the use of prohibited materials before the harvest of the feed crop.

6.3.3

This clause makes it possible for all parts of a production unit converting to organic production to reach organic status at the same time, instead of waiting until all forages are certified before starting the transition of the dairy or beef herd or sheep flock. Without this allowance, transition time would increase by 12 or more months depending on the date of the hay harvest. Subclause 6.3.3 does not apply to poultry operations.

For example, feed harvested from fields in the 3rd year of transition can be considered organic when fed to the dairy cows on the same farm during their 12-month transition period. It is also still considered organic feed once the

herd transition is completed. This feed cannot be used as organic on another farm and 3rd-year transitional feed cannot be purchased from another farm and fed as organic.

This allowance does not make it possible to produce organic milk or meat from livestock before the land has organic status. Offspring of meat animals will only be considered organic if they were born after the land transition is complete. Accurate harvest records will be important to verify status of both feed and livestock.

If new land is brought into the operation after the initial transition is complete, transitional feed from this land does not have organic status on the farm until it meets the 36-month requirement. Feed from buffer zones is not considered transitional feed – it is conventional.

6.4 Livestock feed

6.4.1

If organic feed cannot be sourced in sufficient quality and type to provide a balanced ration suitable for the type of livestock, the livestock cannot be considered organic. Feed supply is one of the limiting factors on the size of a livestock production unit. Livestock may be fed organic food waste (≥ 95% organic content) if it is part of a healthy, balanced diet. Food products containing 70-95% organic ingredients can only be fed according to the derogation in 6.4.7.

6.4.2

As well as providing the necessary amounts of protein, energy, vitamins and minerals, the feed must be suited to the type of animal including their different behavioural needs at different stages of life. Examples are given in 6.4.3.

6.4.3 a)

Feeding dairy calves at least 4 litres (1.06 gallons) of good quality colostrum within 12 hours of birth is recommended. The recommended amount for kids is 150 ml/kg (2.3 oz/lb) of body weight over the first 24 hours and 200 ml/kg (3.07 oz/lb) of body weight for lambs.

6.4.3 b)

Although it cannot be considered natural, the standard allows offspring of dairy animals to be removed after the first 24 hours and after having received colostrum through suckling and supplemental feeding.

When there is disease in the herd such as caprine arthritis encephalitis (CAE) or Johnes' disease that can be spread via the mother's milk, there is the option to remove the newborn immediately to prevent nursing. In this case, farmers will need to provide the young with sufficient colostrum according to the recommended amounts.

6.4.3 c)

Calves are naturally motivated to consume large volumes of milk; it is important to provide sufficient quantity. The Code of Practices adopted by Europe and North America recommends offering a minimum total daily intake of 20% of body weight in whole milk until 28 days of age. This is equivalent to a minimum of 8 litres/day for Holstein calves or 6 litres/day for Jersey calves.

6.4.3 d)

Milk replacer can only be used in emergencies.

SIC Q394: Can non-organic reconstituted milk be given to the replacement kids in an organic goat dairy herd if the 12 month transition for the kids is respected?

A: No. The exception for 6.2.3 only applies to herds and animals in transition to organic production. 6.4.3 d) provides specific requirement for lambs and kids which only permits organic milk (fresh whole or reconstituted). 6.4.7 only permits non-organic feed in the case of a catastrophic event or a regional shortage for breeding herds. 6.4.7b also specifies that 6.2.3 applies to offspring.

6.4.3 e)

No additional information required.

6.4.3 f)

When bottle feeding, high-quality roughage (e.g., hay) should also be available free choice to promote rumen development and achieve optimal growth and

health. Refer to growth curves for young animals to verify that the growth rate and condition is optimal.

6.4.3 g)

Ruminants are naturally adapted to a diet based on roughage. A high proportion of grain or concentrate reduces the pH in the rumen which can lead to health problems. The only time increasing the grain ration is justified is in extreme cases when extra energy is needed to prevent a serious loss of body condition.

6.4.3 h)

The specific requirements outlined in 6.4.3h are also to ensure that the functioning of the rumen is not compromised.

Long fibres are important for a healthy digestion. They stimulate rumen muscle contractions, which leads to more chewing (of the cud) and saliva production. The mixture of cud with saliva helps buffer the rumen allowing the beneficial micro-organisms to thrive. Feeding only short-fibre silage can lead to poor digestion or rumen acidosis. Although 15% is higher than commonly seen in conventional dairy production, it is considered a be a very good way to prevent acidosis and related health problems.

6.4.3 i)

No additional information required.

6.4.3 j)

Vegetable matter is required for pigs to:

- satisfy hunger,
- satisfy their need to chew,
- allow for natural foraging behaviour, and
- provide access to roughage.

“Vegetable matter” must be organic and refers to fruit , vegetables, the associated crop waste, and forages (straw, hay, pasture) but not grain seed screenings. Green matter can provide a natural source of vitamins, minerals

and amino acids for poultry and pigs. For example, a grass/clover forage with chicory can contribute 70% of requirements for lysine and methionine for poultry and significantly contribute to the amino acid requirements of dry sows.

Green matter is also considered an important environmental enrichment aid, which has various potential health benefits. For example, provision of green matter can help decrease or prevent feather pecking.

6.4.3 k)

In conventional production, from 2-3 weeks of age, feed is usually restricted for broiler breeders genetically selected for high feed conversion rates. This practice reduces high body weights with their associated welfare risks. However restricted feeding programs will result in chronic hunger which adversely affects welfare. This illustrates the unsuitability of these high productivity breeds for organic production systems.

6.4.3 l)

Rabbits are herbivores and their teeth grow continuously throughout their lifetime. The chewing of tough, fibrous plant material keeps their teeth properly worn down.

6.4.4 a)

No additional information required.

6.4.4 b)

These prohibitions ensure that livestock are fed as naturally as possible without the use of drugs to promote growth. Also, feeds cannot contain veterinary drugs such as coccidiostats or antibiotics as disease-prevention measures.

6.4.4 b)

These prohibitions ensure that livestock are fed as naturally as possible without the use of drugs to promote growth. Also, feeds cannot contain veterinary drugs such as coccidiostats or antibiotics as disease-prevention measures.

6.4.4 c)

The Permitted Substances Lists published by the export markets (Europe, Canada, and Australia) describe in broad categories the types of additives and supplements that are allowed and any conditions that apply to their use.

Recognizing that the feed available for rations may not always provide the trace minerals and vitamins needed for good health and adequate nutrition, supplements are allowed but should be of non-synthetic origin whenever possible. Supplements of synthetic origin are only allowed when non-synthetic ones are unavailable. Probiotics, enzymes and microorganisms are allowed.

6.4.4 d)

No additional information required.

6.4.4 e)

The prohibition of the by-products of mammalian or avian slaughter is just that– it does not preclude the use of milk, milk products, eggs, or egg products as poultry feed. Fish products are allowed as supplements to provide needed amino acids or vitamins but cannot be used as a source of protein or energy feed unless organic.

6.4.4 f)

No additional information required.

6.4.4 g)

Allowed preservatives are those derived from non-GE bacteria, fungi or food by-products (such as molasses or whey), as well as lactic, propionic and formic acid.

6.4.4 h, i, j)

No additional information required.

6.4.5

Certification inspectors will need to determine if water is readily accessible for the numbers of animals housed.

For example, according to the *North American and European Codes of Practice for the Care and Handling of Farm Animals* there should be:

- 1 bell drinker per 120 broiler chickens, or 5-20 birds per nipple;
- 50-75 laying hens per round waterer, 6-10 per nipple;
- 1 bell drinker per 100 turkeys; one nipple for 1-15 hogs or 6 sows; and
- 10% of cattle should be able to drink at one time.

The main water source used for livestock drinking water must be tested for substances that are potential water contaminants in the area where the farm or ranch is located.

It is not necessary to test for every potential toxin at a cost of thousands of dollars. Identify the main water quality concerns for the livestock being raised and assess the risks.

For example, farmers should test for arsenic in areas where arsenic is known to be in well water, if the well is the main source used. Areas where there is industrial activity such as gas/oil wells might warrant testing for hydrocarbons. It is important to test for nitrates everywhere.

Blooms of blue-green algae (cyanobacteria) in stagnant water can be a problem in the summer and fall and could be the cause of unexplained livestock deaths.

If there is a recommended standardized test for livestock water in a given region or province, use that for an initial test. *Livestock Water Quality – A field guide for cattle, horses, poultry & swine* (published by AAFC and the University of Saskatchewan) provides information about recommended upper safe levels.

Testing for bacterial contamination (total coliforms and *E. coli*) on a regular basis is important because of the potential for contaminated water to introduce pathogens into the food chain.

According to the guide, " In most jurisdictions, it is generally recommended that drinking water for livestock should contain less than 100 coliforms/100 mL." It also notes "Dugouts in rural areas that are not contaminated usually have *E. coli* counts of 20 to 100 per 100 mL, with wildlife being the

predominant source. With direct watering of cattle, these counts may increase to greater than 10,000 counts per 100 mL for extreme cases."

The standards currently state that action must taken if coliform bacteria levels are more than 100/100 ml (1/3.38 oz). This statement is under review by the Standards Interpretation Committee to determine whether it applies to total coliform levels or just levels of *E. coli*.

6.4.6

Force-feeding ducks and geese by inserting a tube into the throat to enlarge the liver (to produce an organic version of foie gras) is not compatible with the principles of organic production. It is considered cruel and stressful for the birds, negatively affecting liver function and potentially causing wounds.

6.4.7 a)

This derogation allows a producer to source whatever feed is available in a short-term emergency situation to allow the operator to maintain the health of animals without losing organic status and without having first to get specific permission from the certifier. The certifier should be notified if such an event occurs. Non-organic bypass fat would not be allowed, however, as the feed energy needed could be sufficiently provided by non-organic grains, silage and haylage after the catastrophic event. It applies in the case of an event over which the operator has no control and which destroys or makes the feed supply unavailable. It does not include commercial or logistical challenges such as feed shipments being held up at the border. These problems can be avoided with better advance planning.

Ten days is considered enough time to find a replacement supply of organic feed. If organic feed cannot be sourced within the 10 days, unfortunately the livestock will lose organic status.

6.4.7 b)

When organic forage is in short supply due to ongoing circumstances such as a widespread regional drought, there is no allowance for the use of non-organic forage for livestock destined for meat or those producing milk. However transitional forage and non-GE conventional forage crops may be used for cows, ewes and does in the breeding herd (for meat production) as long as

they are not in the last third of gestation or nursing offspring, and for dairy heifers until the end of the second trimester. Permission from the certifier is required before feeding non-organic forage under this derogation.

6.5 Transport and handling

6.5.1

Since Sri Lanka does not have any extensive experience in the production of meat and poultry using organic feeds, it is best that the Ministry requests the Embassies of Canada, EU and Australia to provide inputs.

For example, Sri Lanka can request the Government of Canada to provide The *Code of Practice for the Care and Handling of Farm Animals: Transportation* (2001) is recommended as a reference.

For poultry, the following documents provide helpful guidance.

Code of Practice for the Care and Handling of Hatching Eggs, Breeders, Chickens & Turkeys, (2016) Section 7 Transportation.

Recommended Code of Practice for the Care and Handling of Pullets, Layers and Spent Fowl. Section 7 Handling & Transportation

These documents are currently managed by the National Farm Animal Care Council (see www.nfacc.ca/codes-of-practice).

Producers are advised to study the recommendations of Temple Grandin (www.grandin.com) to learn about handling facilities and methods which are the least stressful for livestock and handler.

Give consideration to both the design and the methods used. For example, pens, races, crates and shackles need to be in good condition so as not to cause injury. Birds must be hung on a shackle by both legs.

6.5.2

Although specific stocking densities are just recommendations in the *Code of Practice*, they are minimum requirements for organic operations (as indicated by the term “shall conform”).

Sufficient floor space is required to allow for adequate ventilation and a reasonable level of comfort, as well as enough space for the animal to be able to assume a natural position without coming into contact with the roof.

Density in poultry crates must permit all birds to rest on the floor at same time if evenly distributed and to move their heads freely when sitting.

Cold weather maximum densities:

- Chickens 63 kg/m^2 (139 lbs/10ft^2)
- Turkeys 98 kg/m^2 (216 lbs/10 ft^2)

Reduce density in summer.

Maximum group size for day old chicks is 100 with 21 cm^2 (3.26 in^2) floor space per chick.

Density charts in Appendix 2 of the Transportation Code allow determinations to be made for each livestock type. For example: a 544-kg (1200-lb) beef animal requires a minimum area per animal of 1.3 m^2 (14 ft^2) with a maximum loading density of 420 kg/m^2 (86 lb/ft^2).

Hog transport density for 113-kg (250-lb) pigs is 278 kg/m^2 (57 lbs/ft^2) and minimum area of 0.42 m^2 (4.5 ft^2) per pig.

6.5.3

Inspection should verify the modes of transportation and determine if they are suitable for the type and number of livestock being moved, while also taking into consideration the time of year.

6.5.4

The standards do not prohibit auctions or the use of sale yards, but their use is discouraged for animal welfare reasons, even for cull animals.

6.5.5

The requirement is that transportation time be as short as possible. This means, for example, that livestock being sent to slaughter must be sent to the

closest facility approved for handling organic livestock and inspected for the intended market (provincial or federal).

Short haul transport is considered less than 4 hours; anything over 6 hours is long haul. Given the size of the country it is possible that even “as short as possible” will be several hours. If organic livestock have to be transported for more than 5 hours, there are maximum times for travel which, once reached, require that the animals be unloaded and given feed, water and 5 hours of rest time. According to the Health of Animal regulations, maximum travel times are as follows:

- Market hogs – 36 hours;
- Sheep, goats and cattle – 48 hours;
- Lactating dairy cows – 12 hours;
- Un-weaned calves – 18 hours;
- Poultry – 36 hours.

Although these time limits are referenced by the standard, it does not mean that long distance transport is encouraged or that the first statement of 6.5.5 can be ignored. For red meat animals, the duration of transportation ideally should be less than 8 hours. Transportation longer than 8 hours should include sufficient bedding and feed. Water must be provided at the end of the journey. Only approved haulers should be used.

.5.7

Manually applied blunt trauma to the head is not an appropriate method for cattle. Penetrating or non-penetrating captive bolt and gunshot are methods which can be used by non-veterinarians.

Lethal injection by a licensed veterinarian is recommended for emergency euthanasia. For poultry, acceptable methods include cervical dislocation (for smaller birds) and a quick firm blow to the head after proper restraint of the bird (for larger birds). Euthanasia methods for each type of animals can be found in the specific code of practice.

6.6 Livestock health care

6.6.1

6.6.1 outlines the combination of management practices that are necessary in order to prevent disease, develop a strong immune system, and promote wellness. Diet, housing, handling and observation all contribute to good health.

Vaccines are categorized in the PSL as 'veterinary biologics' not 'veterinary drugs.' Vaccines grown on GE substrate may be used if no alternative is commercially available and no traces of the GE substrate exist in the vaccine (32.311 – 5.1.2). Day-old birds and fertilized eggs can be given any type of vaccine. GE vaccines that are products of genetic engineering, as defined in clause 3.27 of 32.310, cannot be used on birds older than one day.

If there are health problems, it is up to the producer to look at all aspects of the operation to determine the contributing factors and develop a plan to prevent and/or solve the problems. A certifying body should ensure that producers have reviewed the operation in its entirety, and that they consult with a licensed veterinarian when there are recurrent health problems.

Check livestock regularly, particularly for lameness and foot ailments which are often associated with inadequate housing, pen or pasture conditions. Lameness in more than 10% of a herd (or flock), for example, is an indicator of poor welfare standards and requires corrective action on the part of the producer. Producers should be aware of the possible risk factors and provide adequate foot care for all animals. For dairy cattle, this would include regular feet trimming at least twice per year.

6.6.2

The only veterinary drugs that can be used in the absence of illness are those used to reduce pain and stress when dehorning, castrating or carrying out other allowed physical alterations as outlined in 6.6.4c.

Veterinary drugs in feed, whether for disease prevention or to promote growth, are prohibited.

If a meat animal is treated with an antibiotic, it loses its organic status permanently. However, that animal may remain in the herd, provided it is permanently marked. Eggs and meat from laying poultry that have been treated with antibiotics are considered non-organic.

6.6.3

Oxytocin is the only hormone that can be used without affecting the organic status of an animal sold for meat. It can only be used to treat post-parturition conditions such as retained placenta and failure to let down milk. Although there is no withdrawal period on the Oxytocin label, the organic standard requires a 14-day withdrawal period.

6.6.4

Physical alternations are not to be carried out as a matter of course even if the practice has been considered routine in the past. Whenever possible, alternatives should be considered.

6.6.4 a)

No additional information required.

6.6.4 b)

With large flocks of commercial poultry breeds, beak trimming is normally considered necessary to reduce damage caused by feather pecking or outbreaks of cannibalism. To avoid stress, the procedure needs to be carried out at an early age (i.e., before problems arise). Trimming does not address the cause of the problem. To be compliant with the standard, the operator must demonstrate other measures taken to control this problematic behavior, such as encouraging range use.

Use of peepers/binders to prevent or control cannibalism is a prohibited practice if pins are used as it would be an unnecessary physical alteration. Without pins, they would still be considered an animal welfare issue.

Trimming of needle teeth in pigs is not considered absolutely necessary and should never be carried out as a matter of course. Litters need to be monitored carefully; there are more likely to be problems with larger litters where competition is more intense. If needle teeth are causing injury, a grinder can be used to blunt the tips.

Although tail docking of pigs is not specifically prohibited, it is not considered a necessary practice. Tail biting is related to welfare deficiencies such as overcrowded pens without bedding. It can be prevented by providing a behaviourally appropriate and comfortable environment — one that allows

nosing, chewing and rooting in straw, for example, rather than having the pigs redirect this behaviour towards companions in an aggressive manner.

6.6.4 c)

If alterations are necessary, use the methods that cause the least pain and stress. Pain can also be reduced by using local anaesthetics, non-steroid analgesics (painkillers) and sedatives.

Again, Sri Lanka needs to obtain the inputs from the Government of Canada to implement the organic zone for poultry and meat production. The Canadian Animal Welfare Task Force fact sheets provide guidance on best practices. These are posted on the Organic Agriculture Centre of Canada website: www.organicagcentre.ca.

Removal of the horn buds of calves with caustic paste (lime is prohibited), analgesics and sedatives is less traumatic than hot-iron dehorning with an anaesthetic (lidocaine). Adult cattle should not undergo dehorning procedures.

Some traditionally used methods are no longer considered acceptable without pain medication. The latest revisions of the *Codes of Practice* include requirements for the use of pain control. Anything required by the *Code* is a requirement for organic operations.

Dairy cattle: pain control must be used when dehorning or disbudding (up to 3 weeks of age).

Beef cattle: disbud calves as early as practically possible while horn development is still at the horn bud stage. For older calves (after horn bud attachment), use pain control to mitigate pain associated with dehorning. Use pain control when castrating bulls over 9 months of age. As of January 2018, the requirement will be that pain control is need for castrating bull calves over 6 months of age.

Pigs: castration or tail docking performed at any age must be done with analgesics to help control post-procedure pain. There is no allowance in CAN/CGSB-32.311 for the use of immuno-castration products which uses the pig's own immune system to control substances that cause boar taint.

Sheep: castration using rubber rings is allowed for lambs from 24 hours to 10 days of age, and up to 6 weeks of age in a pasture lambing system. Surgical castration is allowed for lambs from 24 hours to 4 weeks of age; the Burdizzo is

allowed for lambs up to 6 weeks of age. If castrated at a later date, anesthesia and analgesia are required. Tail docking must not be done using rubber rings for lambs after 6 weeks of age.

Goats: castration should be done before kids are 7 days old (2003 *Code of Practice*).

6.6.5

Even with preventive measures in place, it is probable that one or more animals will need treatment for disease or injury. Methods of treatment that do not require the use of antibiotics or other veterinary drugs are encouraged as the first course of action. Allowed treatments include homeopathy, the use of Ayurvedic and herbal products, acupuncture, provision of trace elements or vitamins, and the use of probiotics. Early intervention is essential to the success of such treatments.

6.6.6

If the animal is not responding to alternative treatments such as those mentioned above, then appropriate antibiotic or other veterinary drugs must be given to prevent further pain and suffering, even if it means the animal can no longer be considered organic.

6.6.7

Monitor animals regularly for health. Sick animals or those undergoing treatment do not have to be separated from other livestock unless there is a risk of (i) the disease being spread or (ii) injury to the affected animal if the animal is kept with the flock or herd. In situations where separation causes further distress, visual and auditory contact should be maintained with other animals.

6.6.9

Once a sick animal has completed a course of treatment, including (i) the period of withdrawal from organic status stipulated on the medicine label or (ii) the minimum 14-day withdrawal from organic status (counted from the day of the last use of the medication), the animal's milk can be used to feed its organic young, even though the milk cannot be sold as organic for 30 days after the end of the treatment.

6.6.10 a)

Vaccines are allowed for a known disease risk.

6.6.10 b)

The standards encourage the use of alternative treatments (e.g., homeopathy and herbal treatments) over regular veterinary drugs. However, if the animal is not responding to alternative treatments or if alternatives are known to be ineffective, the use of antibiotics, parasiticides and other medications is allowed with the additional restrictions outlined here. “Chemical, allopathic veterinary drugs” refer to synthetic drugs used in mainstream veterinary practice.

6.6.10 c)

The intent of “c)” is to allow the use of any veterinary drug when needed to treat an animal even if not specifically mentioned by the standards (e.g., antibiotics in 6.7.8 and 6.2.2, and synthetic parasiticides in 6.7.8 or listed in the Permitted Substances Lists).

6.6.10 d)

The label on any veterinary medication states the length of time required after the use of the medication before a livestock product (e.g., meat, milk) can be consumed. In organic production, this time must be doubled. In cases where there is no withdrawal listed or it is very short, a minimum of 14 days is required unless the Permitted Substances Lists (PSL) state otherwise.

There are no exceptions to the length of the withdrawal period even if no residues are detectable in the product.

6.6.10 e)

Treatment of dairy animals with antibiotics is allowed only in emergencies, and not on a regular basis. It is not possible to keep the animal in organic production if it has to be treated more than twice during any year.

It makes no difference whether the treatments are with antibiotics or parasiticides. If two drugs are used at the same time, it counts as two treatments. After a third treatment the animal must undergo a 12-month transition before milk can be organic.

If an animal has to be treated repeatedly for the same condition, it is not well adapted to the production system and must be removed from the organic herd or flock.

Any livestock treated with a veterinary drug must be clearly identified. Record all types of treatments, including treatment with homeopathic or natural remedies. Include in the records:

· The details of all treatments, such as their duration and the trade names of substances used;

· Tracking of treated animal/flock/colony through all stages of production, transportation, slaughter and processing; and

· The disposal methods of milk, waste or other products from treated livestock.

6.6.11

The written plan has to clearly state all the measures that are in place to prevent parasites reaching a level that negatively affects the welfare of the animals. The plan cannot rely on the regular use of synthetic parasiticides (anthelmintics). Regular pasture rotation is a key element of any plan; the length of the rotation required depends on the particular parasite and the climate. Another strategy is selecting animals that are resistant to infection as breeding stock.

· Derogation (an exemption) is allowed in recognition that internal parasites are problematic for young livestock and particularly so for lambs under certain climatic conditions. It was not intended as a derogation for external parasites such as lice and ticks. The operator must prove that parasites are the problem and consult with a licensed veterinarian before any treatment occurs. Such treatments cannot be a regular part of the annual management cycle.

· Young animals cannot be treated more than once if sent to slaughter before they are one year old. Older meat animals can maintain organic status as long as they are not treated with parasiticides more than twice during their lifetime. Treated livestock must be clearly identified and precise records kept of any treatment.

· If an animal is culled from the dairy herd and has received more than 2 treatments during its lifetime, meat from the animal would not be organic.

· If a cow, ewe or sow is treated with parasiticides during gestation, this treatment does not affect the organic status of the offspring.

· In situations where parasites are identified as the cause of increased mortality or other health issues in a layer flock, one treatment a year is allowed without loss of status. There is no derogation for meat birds.

The operator must develop a new plan which addresses the failure of preventative measures already in place to prevent parasite build-up.

6.6.12

If it is necessary to use veterinary drugs that do not fall within a category listed in Table 5.3 of the PSL, livestock can still be considered organic for breeding purposes but meat from those animals or birds cannot be considered organic meat. The only exceptions are those listed for parasiticide use in 6.6.11.

6.6.13

An animal cannot be left to suffer; it must be treated. If there is no other alternative, it is expected that the animal will be humanely euthanized.

6.6.14

Forced moulting involves withdrawing feed for 5-14 days in order to trigger a flock to moult simultaneously with the intention of rejuvenating the hen's egg production capabilities. It is considered inhumane.

6.7 Livestock living conditions

6.7.1

The basic requirements for any livestock production unit are outlined in 6.7; these are applicable (as appropriate) to any area used for livestock including:

· Barns – roofed structures for animal confinement;

· Runs – exercise areas connected to barns with little or no pasture;

· Corrals – fenced areas without pasture;

· Paddocks – fenced areas with or without pasture;

· Pastures – fenced areas with grass that animals can eat;

· Rangeland – large areas of unfenced and uncultivated pasture.

The opening sentence states the intent, while 6.7.a-6.7.j expand on the aspects that need to be considered to determine if this has been achieved. These requirements are described in more detail for specific types of livestock in later sections of the standard.

The operator and the certification inspector need to be aware of the natural behaviour patterns of the type of livestock being raised in order to interpret the standards as intended.

For example, pigs should be raised in an environment which recognizes that they are strongly motivated to (i) graze, forage and root for food; (ii) to explore and socialize with other members of their herd or litter; and (iii) to build a nest at farrowing. Availability of straw is important in this regard. They will also need access to a means of cooling (e.g., wallows, sprinklers or fans) whenever temperatures exceed 18C.

Although not explicitly stated, operators should take into account:

- Factors that potentially have negative effects on behavior and comfort; and
- Other environmental factors such as construction design, spurious electrical discharge, excessive noise (louder than 100 dB) and toxic materials (e.g., lead paint, treated wood).

All facilities used to confine livestock must protect the animals' health and welfare. They should be conducive to the animals' normal social behaviour (including the ability to make some contact with other animals and to escape from aggression), as well as allowing for normal feeding behaviour and bedding practices. In addition, facilities should provide the animals with hygienic, comfortable surroundings and fresh air, and should allow for exercise. Facilities must also be designed to reduce the potential for injury, hence the requirement for non-slip flooring.

6.7.1 a)

Access to the outdoors is necessary for all livestock, but it is also recognized that in the Canadian climate, there will be times when outdoor access is problematic for some types of livestock. Cold temperatures are not a good

reason to keep animals confined, but protection is needed from excessive exposure to sunlight, extreme temperatures, precipitation and wind (e.g., in the form of shade or windbreaks). Poultry do not utilize outdoor runs when there is snow on the ground and it is therefore unreasonable to enforce the outdoor access requirement from November to March in many parts of Canada. However, poultry will venture outside, even in cold temperatures, if covered patios are provided.

6.7.1 f)

Aerial contaminants inside barns (e.g., dust, ammonia) should not reach sustained levels deleterious to livestock or human health. Good air quality is important for both welfare and productivity. Problems occur particularly in the winter months if animals are confined and more often with swine and poultry operations. Wet litter is an indicator of potentially high levels.

Exposure to ammonia levels above 25 ppm is hazardous for humans as well as livestock. Hydrion ammonia test paper is the simplest method of measuring if ammonia has reached harmful levels. Ideally levels should be kept at or below:

- Ammonia: ≤10 ppm
- Carbon dioxide: ≤ 3000 ppm
- Hydrogen sulphide: ≤0.5 ppm
- Dust: ≤ 10 mg per cubic metre (1 m^3=1.3 yd^3)

6.7.1 g)

Although organic bedding is mentioned, this statement is not intended to exclude other materials that meet the needs of the animal as long as they do not contain prohibited substances. For example, sand or a mixture of straw and ground limestone can be used in deep litter stalls. Other non-agricultural absorbent bedding sources (minerals, cellulose, sawdust, paper products, etc.,) can be used for livestock bedding as long as they are not GE products (1.4 a), and do not contain and/or have not been treated with prohibited substances (1.4 l).

6.7.1 h)

There is a higher incidence of foot and leg injuries on slatted floors than on solid ones. Consequently, not all of the floor can be slatted. While the standards do not specify the allowed percentage, it is generally recommended that no more than one-third of the total floor area be slatted.

The prohibition on totally slatted or gridded floors applies to all livestock facilities including poultry barns. In the case of poultry, “bedding” means a layer of litter material. Litter, such as straw or wood shavings, which the birds can use to exhibit natural pecking and foraging behaviour, is particularly important in winter if birds do not have access to outdoor runs.

6.7.1 i)

Tie stalls cannot be used for birthing; the space provided for birthing indoors must allow for the behavioural needs of the animals to be met.

6.7.1 j)

A livestock operation cannot negatively impact the environment and remain compliant with organic standards (i.e., meet the requirements of the standards).

6.7.2 a)

If the weather or outside conditions are bad enough to seriously compromise the health of the animals or birds, they can be confined temporarily. For example, young birds are usually confined until fully feathered. Otherwise, operators must be able to identify specific risks (such as high parasite loads contaminating pasture) to justify keeping young livestock confined. Differences in temperatures between inside and out do not constitute a legitimate reason unless the temperature difference is extreme. It is also not acceptable to confine livestock the entire winter – most species will benefit from outdoor access even in cold temperatures.

6.7.2 b)

A hypothetical risk with no scientific justification or substantive evidence, such as the threat of avian flu posed by wild birds, is not considered justification for restricting outside access for poultry. However a barn located under a flyway might be considered high risk during spring or fall migration.

6.7.2 c)

Systems should be designed such that livestock and stocking densities do not negatively affect soil, water or plant quality, and conversely, organic livestock operations should not be located where there are known risks which would prevent animals from being allowed outside. Certifying bodies would only allow exceptions relating to the quality of water, soil or plants in exceptional circumstances.

6.7.3

Tethering of dairy cows in winter is only allowed because it is recognized that not all producers can build a new barn in order to convert to organic production.

Temporary restraint is sometimes necessary for veterinary treatment and is allowed.

6.7.4

It is not a requirement to use substances in Table 7.3 and 7.4 for cleaning buildings when empty, or for routine cleaning of walls or floors. However if the substances listed are effective for the cleaning job, use of the products on the list is preferred over use of other products in order to minimize environmental impact. Any equipment that comes into contact with organic food products must be cleaned with substances allowed by 7.3 and 7.4 of the PSL unless shown to be ineffective (in which case 8.2.3 applies).

6.7.5

The issue of parallel production in livestock is addressed in 6.7.5; this differs from the requirements regarding parallel production in crops. A production unit includes the livestock, the barn where they are housed, feed and input storage areas, runs and pasture. A breeding herd and offspring are considered a single production unit.

Individual animals that have lost organic status may remain in the production unit as long as non-organic animals are clearly identified.

Different livestock types on the same farm may be managed differently as they are clearly different production units (e.g., organic layer hens and non-organic hog production). If similar types of livestock are kept in different production

units and not managed organically, complete separation must be ensured. This would require separate records, barns, separate feed and input storage areas, separate runs and separate pasture, etc.

If there are two layer flocks housed in different barns on the same property, one organic and one conventional, all aspects of the operation need to be clearly separated including egg cleaning and packing. Ideally the organic products would also be clearly distinguishable (e.g., brown eggs for the organic operation and white eggs for the non-organic one). The same applies to meat birds or turkeys: complete separation of all aspects of rearing and processing is required if one flock of meat birds (or turkeys) is organic and the other is not.

If an operator has an organic and non-organic dairy herd of Holsteins, for example, the herds should be on different farms or at the very least in different barns with separate feed storage areas, separate pastures, and different milk tanks that are clearly identified. If the herds use the same milking parlour, specific protocols are needed to prevent unintended contamination or commingling. Operators should milk the organic cows first and always use allowed products for teat dips, cleaners and sanitizers regardless of which herd is being milked.

6.7.6

If herds are run on common land documentation will be needed from the relevant provincial or regional agency.

Assurance will also be required from other producers with livestock on the common land, that health care or feed products that they use (e.g., mineral licks) are compliant with the standards.

6.8 Manure management

6.8.1

No additional information required.

6.8.2

Ensure the quantity of manure produced by the livestock can be handled so it does not become a liability. Aspects of manure management to be reviewed include:

- location and type of storage areas (covered/uncovered);
- location of wintering feeding sites;
- distance from watercourse;
- timing of spreading;
- area of land available for spreading manure;
- frequency of scraping pens or yards;
- collection of run-off; and
- specific climate considerations (e.g., high rainfall or timing of snow melt).

Environmental Farm Plan programs provide detailed guidance.

Provincial governments provide guidelines and/or regulations for manure storage and handling facilities which are intended to prevent pollution.

In most parts of Canada, storage should be large enough to accommodate several months' worth of manure production.

6.9 Livestock product preparation

Organic integrity has to maintained at all times both on the farm and in any processing facility. For example, the requirements of 8 "Maintaining organic integrity during cleaning, preparation and transportation" apply to:

· milking parlours, bulk tanks and transportation of milk to the processor;

· egg cleaning and packing; and

· slaughter of livestock for organic meat.

6.10 Pest management

Subclause 8.3 outlines methods for prevention and control of pests on farms. Preventive pest management includes the removal of feces, urine and any spilled food as often as necessary to minimize smells and attractants for insects and rodents.

For fly control, acceptable methods include the use of parasitic wasps which kill immature stages of flies, sticky traps and traps baited with an attractant.

Mechanical traps are used for rodent control. Most rodent baits are not acceptable, but products with cholecalciferol (vitamin D_3) as the active ingredient are allowed; see the Permitted Substances Lists (PSL) Table 8.2.

Document all methods used. If allowed methods or substances are not effective, substances not on the PSL can be used if measures are taken to ensure there is no risk to organic product status or integrity.

6.11 Additional requirements for cattle, sheep and goats

6.11.1

As a general rule, herbivores cannot be kept in a barn and fed organic forage during the grazing season.

Research has shown that access to pasture can reduce the incidence of health problems of dairy cattle such as mastitis, metritis and lameness.

It is recommended that cattle be pastured for a minimum of 120 days per year during the appropriate seasons. Access to shade is needed to prevent heat stress during hot sunny days.

Pasture should supply the majority of dry matter intake and nutritional requirements for cattle and sheep during the grazing season (even though in 6.1.3 the minimum requirement is only 30%). Whenever pasture conditions become inadequate to meet body condition needs of the livestock, supplementary forage must be provided as needed.

When growing conditions during the grazing season are not conducive to pasturing (e.g., drought), the animals should still spend time outdoors; at least 4-5 hours a day are recommended.

Access to the open air or exercise areas is also required for young herbivores; the exception in 6.11.1c is only for pasture.

Examples of allowed exceptions to the pasture requirement:

a) Bulls or rams may be kept without access to pasture when separated from the rest of the herd/flock outside of the breeding season or to ensure operator safety.

b) A conventional feedlot system of beef production, where cattle are confined and fed a high-energy, grain-based ration, is not acceptable for

organic production. However, the standards do not prohibit confining cattle to paddocks for the final production phase before slaughter and feeding with an appropriate forage/grain finishing ration in compliance with 6.4.3g. Depending on the breed, cattle should be pastured until they reach at least 360-400 kg (800-900 lbs) before finishing. The confinement facility must be an organic production unit separated from any conventional production units at the same location.

c) Lambs may be kept off pasture at times when parasite loads are high enough to create health issues for the lambs. Evidence will be needed to show the existence of a problem.

6.11.2

Cattle do not need to have indoor space. However, if indoor housing is used, a minimum amount of space is required for each animal. The indoor space for bedded pack and maternity pens described in the table is the measurement of the resting area. It does not include the feed alley (which is concrete). The values shown in the table are minimums. All animals in a pen should be able to lie down and rest comfortably at the same time. Space allowances should also take into account the presence or absence of horns.

It is not acceptable to have dairy cattle in tie stalls when giving birth; maternity pens are needed if cows are confined to barns for birthing.

Outdoor runs and pens include any yard or exercise area where the animals are confined outside without free access to pasture. When the barn design allows for free movement between inside and outside, there is not a requirement of minimum size of outdoor space per head, however the run should be large enough for all cattle to be outside at the same time.

It is a good practice to have cows outside in winter time. When winter conditions are such that being outdoors is physically challenging, an open-sided barn could provide access to open air without the need to go outside. The most important requirement for the well-being of the animals in the winter is to have exercise no matter where it happens.

6.11.3 Sheep and goat housing

When indoor housing is used for sheep or goats, the animal must have at least the amount of space listed in the table. It does not mean that sheep and goats have to have indoor space.

In Europe, sheep often have access to indoor housing during the winter (In Sri Lanka's case, would be the rainy season) months and at lambing. Depending on the predator threat, they may also be brought into pens or paddocks close to the barn at night.

6.12 Additional requirements for dairy cattle housing

6.12.1

The use of tie stalls for the milking herd is allowed. Tie stalls cannot be used for heifers except for a training period immediately before the a heifer joins the milking herd.

If a new barn is to be built or major renovations are planned, tie stalls cannot be part of the design.

To help reduce the negative effects of tie stalls which restrict movement, regular exercise periods are mandatory in months when cows are not going out on pasture.

In cases where the current farm infrastructure limits the ability of the operator to provide exercise and to keep heifers in loose housing, a derogation is provided to allow time for barn renovations or construction of new buildings and exercise yards. This derogation ends in November 2020 by which time there must be no tethering of heifers and the operator must be exercising milk cows at least twice a week in the winter.

6.12.2

One free stall is required for every cow in the herd. This is a maximum; ideally you want to have 5% of the stalls not occupied to give space for cows that are low in the hierarchy, such as young cows.

6.12.3

The intent is to phase out the use of electric trainers in tie-stall barns by November 2020. Tie-stalls cannot be included in the design of any new facilities built after November 2015.

If electric trainers are being used as part of a management strategy to keep cows clean and prevent disease, the recommended best practices in the Code of Practice (2009) are mandatory for organic production. Additional

restrictions are outlined in 6.12.3 a1 and a2. Note that a contact safety bar can be made of a piece of wood suspended a few centimeters below the electric trainer.

The requirements for use of organic farms are as follows:

· Energizers for electric trainers must not exceed 2500 volts.

· Electric trainers must have a height adjustment.

· Electric trainers must be located over the chine (the high point of the cow's back by the shoulders) when the cow is standing with her hind feet near the gutter curb.

· Electric trainers must not restrict the normal eating, standing or lying behavior of cows.

· Electric trainers must not restrict access to feed or water.

· The electric trainer bow must be raised to a higher position when a cow is expected to be or is in heat.

· Electric trainers must be securely attached so they do not fall upon a cow and cause abusive injury.

· Adjust the distance between the trainer bow and the top line of the cow to a minimum of 2 in (5 cm) for training; a 24-hour training period is usually adequate.

· Adjust the distance between the trainer bow and the top line of the cow to 4 in (10 cm) for maintenance.

The energizer must be grounded to a rod outside the barn and not to any stabling within the barn.

6.12.4

These requirements ensure that cows are not subjected to unnecessary stress at milking. Gentle handling, as well as clean udders, contributes to the quality of milk.

Cows should not have to wait more than an hour from when they are brought in for milking until they are returned to barn or pasture.

6.12.5

The operator has the choice of using individual housing or group pens for calves until they are 3 months old. Social contact reduces stress. This is why individual pens should allow calves to “see, smell and hear other calves.”

A hutch with smaller dimensions than those listed in “c)” cannot be used even if a fence encloses a larger area.

When hutches are used outdoors, some form of fencing is required to confine calves – they cannot be tethered.

6.12.6

Group housing of calves is encouraged as early as a few days after birth. Calves are social herd animals; group pens provide them with the opportunity to socialize and exhibit natural behaviours

. Freedom of movement and exercise are also enhanced in group pens.

Group sizes should be sufficiently small to allow each calf uninhibited access to lying areas, feeders and water sources, as well as to ensure that the farmer can easily observe the animals in order to detect health problems. Group sizes of less than 10 are recommended. At least 2.5 m^2 (27 ft^2) per calf is required.

When very young calves are group-housed, age and weight variation within the group should be minimized. When milk is provided to group-housed calves only a few times a day (e.g., twice a day feeding), each calf should have access to its own teat.

6.12.7

Pasture access is encouraged for all calves regardless of age. However, given legitimate concerns that parasite loads on pasture may negatively affect young replacement calves, it is not compulsory to provide pasture for grazing until calves are nine months of age. This does not mean that younger calves should not have access to the outdoors when there are suitable weather and pasture conditions (i.e., the pasture has low levels of parasites, is not waterlogged, etc.).

6.13 Additional requirements for poultry

6.13.1

b) Division of larger layer flocks into smaller units encourages the use of range and helps minimize problems with feather pecking and stress. If changes are required to existing barns, existing operations have until November 2018 to come into full compliance.

c) The intent of 6.13.c is that poultry are able to range freely both inside and outside; it does not allow for total confinement. Some flexibility is allowed on the type of range (it can be pasture or runs) and when access is given (depending on weather, ground conditions or presence of predators).

· Range can still be in transition when pullets are started, but the 36-month mark must have been reached by the time birds are ready to go outside.

· Covered porches and patios are also recommended. These can provide outdoor access when weather conditions are not conducive to the use of outdoor range and also create a buffer area to reduce nutrient loading in the immediate vicinity of the barn.

· For stationary barns, two or more runs are recommended to make it easier to comply with 6.13.c.2. Runs should have complete vegetative cover before birds are returned to them.

· The threat of predation cannot be used a reason to keep birds confined inside at all times; the design of the range must take predation risks into account. Avian predators can be a significant threat and birds are less likely to venture outside or to utilize all the range provided unless there is some cover in the form of trees, shrubs or constructed shade.

· Inspectors will look for droppings or signs of scratching as evidence that the range is being used on a regular basis.

f) The reference to “at minimum of one-third of its laying life” recognizes the difficulty of providing outdoor access to poultry in the wet months. Although the standard provides an allowance to keeping layers inside until peak production (around 28-30 weeks of age), the birds are less likely to venture outside afterwards if they have not been trained to do so at an earlier age.

Providing outdoor access or a covered porch helps pullets become comfortable with the conditions that will exist in the layer barn; this increases their use of range.

g) In cases where large pullet flocks are undergoing an immunization program aimed at building immunity to known diseases, outdoor access is not compulsory. A compromise needs to be made balancing the value of allowing pullets outside with the interests of keeping the birds healthy throughout their life. It is therefore recommended that pullets are raised in facilities which prepare the bird for the environment in the layer barn (such as having access to outdoor runs and/or covered porches) as this will help them adjust with minimal stress, thereby reducing the risk of feather pecking and susceptibility to disease.

h) In cold weather, it is not expected that birds have access to the outdoors. Birds will also need protection in heavy rain or wind. In general, outdoor access is expected from May to September but the season could be longer or shorter depending on location.

6.13.2

Waterfowl need water, however allowing access to a stream, pond or lake used by wild ducks or geese is considered a serious health risk for avian influenza and must be avoided.

6.13.4

The standard requires perches for layers but provides no information on the need for perches for other birds, even though turkeys like to roost. When perches are provided, the size, number and height of perches should allow all birds to roost comfortably. For example, a perch height of 18 cm (7 in) is recommended for hens and 40 cm (16 in) for turkeys.

6.13.5

The design of the barn, including the location and size of exits, are important considerations determining whether or not birds use the outside range.

6.13.5.1

Exit and entry pop holes cannot be so small that dominant birds can prevent others from using the openings. The poultry barn should be designed in a way to address other constraints to access, such as distance from the pophole, height above ground and the total numbers of birds.

The specific requirements are intended for larger-scale poultry operations to facilitate range access.

Combined width means adding the width of each exit that is open to provide outdoor access. Exits that are kept closed (for example, those on the opposite side of the barn which might be used to access a second run when resting the first run) are not included in the calculation. For example, a flock of 6000 hens will require a total of 12 metres (13.1 yards) with openings at least 50 cm (20 in) wide evenly spaced along the side of the barn adjacent to the range.

If small flocks are obviously accessing range easily at all times, changes do not have to be made in order to comply with “evenly distributed along the range of access.”

6.13.5.2

Existing barns do not have to modified providing there is nowhere in the barn which is more than 15 m (49 ft) from an exit complying with 6.13.5.1a. Alternatively, evidence such as date-stamped photos is required to show a good proportion of the flock is regularly on range at any one time. Certification bodies may decide to conduct unannounced inspections to verify the fact.

6.13.6

In order to accommodate the natural behaviour throughout the life cycle, indoor housing for poultry must provide an area of solid floor covered with dry litter materials such as straw, wood shavings, sand or turf, so that the birds can peck and scratch. Wet litter increases ammonia levels; it also encourages darkling beetles.

6.13.7

Enough feeder and drinker space should be provided to reduce competition and aggressive encounters. The amount available is also important; 100 layer pullets may drink 20 litres (5.3 gallons) per day under hot weather conditions, and 100 heavy turkeys may drink up to 180 litres (48 gallons) per day.

Follow manufacturers recommendations if they require more space then the recommended minimums found in the Codes of Practice:

- Trough-type waterers: 2.5 cm (1 in) per broiler, 3-4 cm (1.2-1.6 in) per adult layer, 2.5-3.2 cm (1-1.3 in) per turkey (assuming both sides available – if not double space allocation).
- Nipple-type waterers: 5-20 broiler chickens per nipple or 6-10 adult layers per nipple.
- Bell drinkers: one for 120 broilers, one for 50-75 adult layers, or one for 100 turkeys.

6.13.8

Natural light is considered to be beneficial to bird welfare. It enriches the environment and allows birds to seek out different levels of light for different activities. Good light distribution with a minimum amount of shadow is important; patches of light will attract birds to those spots rather than allowing for an even distribution of birds in the barn.

When windows are less than 1% of total ground floor area, the inspectors will determine if light levels are sufficient to read in the barn when all the lights are turned off. Light levels should be measured furthest away from the source of light. Although some people may be able to read at lower light levels, 20 lux (at bird height) is a recommended light level for broilers and layers. The brighter lighting is important for broilers to stimulate activity which can help reduce the incidence of leg disorders and contact dermatitis (hock and foot pad burn). In comparison, on a bright sunny day, levels might be 80,000 lux outside the barn. Smart phone apps for measuring light levels are available.

Lower lighting levels cannot be used as a preventative method to prevent cannibalism, only to help deal with an actual problem.

6.13.9

The numbers in the table refer to the amount of space required for all birds in the flock, even if only a portion of the flock is using the outdoor range at any one time. There is a larger space requirement for outdoor areas because birds are more active in an outdoor environment. For broilers and turkeys, the requirements are given in "kg/m^2" to allow for the different sizes of birds as they grow and different finished weights.

Both the amount and quality of space are important. Space requirements are based on the minimum needed for birds to perform all of their natural behaviours without negatively affecting birds around them. Generally, the more space birds are provided, the better they fare.

6.13.11

“Pasture-based operation” refers to those operations that use pasture as a component of birds’ diets (as oppose to barns with runs that contain minimal amounts of forage).

When birds are on pasture, two important environmental factors must be considered:

- the potential for build-up of parasites and disease; and
- the negative effects of high nutrient loads on soil and groundwater.

For these reasons, the size of the flock must be appropriate for the amount of land available and mobile units must be moved regularly.

The numbers given for pasture-based operations refer to the amount of land needed assuming that birds will be rotated through different pasture areas. They do not refer to the density of birds on a given area of pasture at one moment in time. For example, if a turkey producer has a hectare of land for pasturing, only 1300 turkeys can be raised at one time, which is equivalent to 7.69 m^2/turkey. For broilers, the equivalent is 4 m^2/ bird.

Moveable field shelters which have to be moved daily are shelters which restrict a large number of birds to a relatively small space. This is not the same as moveable housing or mobile units from which the birds range. With moveable housing, the birds may be free range or enclosed by portable fencing. The fencing might be moved frequently, possibly daily, while the shelter is moved less often.

If the producer uses mobile pens which are moved regularly, the actual density inside these units will be considerably higher. For the broilers, the density cannot be more than 21 kg/m^2; for turkeys, the density cannot be greater than 26 kg/m^2. For optimal flock health and ongoing sustainability, larger areas are recommended, recognizing that maximum productivity per unit area should **not** be the primary goal of organic production.

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6.14 Additional requirements for rabbits

6.14.1

The intent of the standard is to provide rabbits with an environment that allows for natural behaviour and addresses their need for social interaction, comfort, and physical and physiological well being.

Continuous confinement means keeping rabbits in a small cage or hutch whether indoors or outdoors; this method is not allowed for organic production. Overnight confinement is allowed to protect from predators.

If rabbits are confined individually for any purpose, the space available must still meet the requirements of “Table 5 Indoor space,” as well as allowing for visual and auditory contact with other rabbits. Bucks may need to be housed separately to prevent fighting.

Temporary close confinement that may be required for performing certain procedures, such as vaccinations or marking, is allowed.

6.14.2

The use of large wire cages as a mobile pasture pen is not considered confinement in the context of the standard. Instead it is considered one solution for providing access to pasture. Give consideration to the size of the group when using mobile pens or permanent pens. Welfare can be compromised if groups of breeding rabbits exceed 10 animals or when groups of meat animals exceed 40 animals.

A regular movement of pens prevents pasture areas being eroded by the activities of the rabbits or degrading by overgrazing. Rabbits should be able to graze fresh pasture that has not been polluted with manure.

6.14.3

The need for sufficient space to allow for natural and instinctive behaviours apply whether the rabbits are in indoor housing or in covered pens on pasture. There is no one way to raise organic rabbits; the table provides for different housing options.

6.14.4

Rabbits naturally spend time in dark environments but also forage outside at different times of day.

6.14.5

This requirement ensures the provision of a secure environment for a doe and young, and allows a doe to be removed from a group setting in order to build her nest a few days before she gives birth. Nest boxes should be in a dark area and have ample fresh dry bedding. It is recommended they be at least 48 cm (18 in) long by 25 cm (10 in) wide and 23 cm (9 in) high.

6.14.6

Although not a requirement of the standards, kits should also be able to leave the burrow after 14 days.

6.14.7

This requirement will limit the number of litters possible in one year. Kits begin to eat more solid food at about 4 weeks of age as their digestive systems mature and doe milk yield drops. There are no requirements for the age of breeding in order to allow for operations based on a natural colony system where there is no intervention at mating.

Keep records of weaning dates and reasons for earlier weaning.

Newly weaned kits should be kept with their litter mates.

6.15 Additional requirements for pigs and farm-raised wild boar

6.15.1

This paragraph emphasizes the holistic nature of organic production. There is not a requirement that the farm produce all its own feed but there does need to be sufficient land for spreading manure without negatively impacting the environment. This land need not be part of the home farm.

6.15.2

Although the standards do not dictate that organic pigs be raised on pasture, the standards encourage access to pasture or fields from spring to fall, particularly for the breeding herd.

6.15.3

Gestation stalls and traditional farrowing grates which limit movement are not allowed in organic production. Stall designs which permit sows to come and go at will are allowed. Confinement is allowed during periods of high levels of aggression, for example, during estrus, to prevent injury which might occur in a group setting.

Privacy at farrowing is important; it reduces stress and allows piglets and sows to become accustomed to each other. The length of the suckling period will determine the maximum time allowed for individual housing. It is better for the piglets to be in the same familiar environment until they are separated from the sow but that does not preclude a group of sows and piglets being housed together if piglets are about the same age.

Additional restraint is allowed when piglets are very young and in danger of being crushed.

6.15.4

Piglets benefit from longer exposure to mother's milk –the optimum time frame for both sow and piglets is considered to be 30-35 days.

6.15.5

Flat decks were devised as a method of housing small pigs in intensive systems using early weaning to increase sow productivity. They are small cages or pens with slatted floors arranged in tiers or decks. This system is not allowed in organic production. At weaning, piglets should be able to transition directly to housing with accommodates natural behaviours (e.g., deep bedding, separate dunging areas and so on).

6.15.6

No additional information required.

6.15.7

For indoor areas or outdoor areas on concrete, there must be sufficient hay, straw or deep bedding to allow for rooting at any time of year. Similarly, organic production systems require the provision of ample hay or straw to allow for rooting when the ground is frozen.

6.15.8

No additional information required.

6.15.9

These are minimums; more space, particularly outside, would be beneficial.

7.1 APICULTURE

7.1

Conventional honeybees can be used to pollinate organic crops.

In order to collect organic products (e.g., honey, pollen, propolis, royal jelly, beeswax and bee venom), hives need to be managed as described in this standard.

7.1.2

The beekeeper needs to prepare an Organic Apiculture System Plan (see 4.1, 4.2 and 4.3), which should include the following elements:

- detailed map of the forage zone that shows the location of managed hives, organic and wild land, and all non-organic areas;
- description of the quantity of organic and/or wild forage to be provided for each colony;
- honeybee colony density;
- description of the water sources available in the forage zone;
- listing of all land to which prohibited substances are applied, and all other sources of potential contamination located in the forage zone;
- records that include the number, location, condition and management of colonies used in organic production;
- details on practices that can help prevent and treat disease and pest problems; and
- extraction, processing and storing of all bee products.

7.1.3

A chronological log of all activity needs be in place. Records include all written materials. A seasonal journal is usually the easiest way to record beekeeping activities, but beekeepers may comply with the standards in other ways. It can be as simple as notes on a calendar. In addition to records of beekeeping activities, maintenance of sales logs, invoices and other financial records are also required to comply with 32.310-4.4.

7.1.4

Organic beekeeping follows the organic principles described in Section II (the introduction to the standards) and in the appendix, namely to:

- protect the environment;
- encourage biodiversity;
- recycle materials;
- provide attentive care to livestock;
- protect the organic integrity of the product during processing; and
- use renewable resources in local systems.

7.1.5

Organic honeybees need to forage on organic or wild vegetation.

7.1.6

Health is maintained by supplying access to suitable forage, using good management practices and selecting for good stock. In particular, honeybees with disease-resistance, strong foraging ability and good housekeeping abilities should be selected for organic stock.

7.1.7

Bee yards should be situated so that they do not have a negative impact on wild insects in the area.

Certifying bodies may wish to ensure that there is adequate forage available for colonies in wild sites; not just for the colonies, but also for wild insects that rely on flowers for their nourishment. “Adequate forage” does require some subjective judgment on the part of certifying bodies, but common sense should guide certifying body inspectors in this regard.

7.1.8 Transition

7.1.8.1

A period of 12 months of organic hive management is required before organic products can be harvested. For certification purposes, the one-year transition only begins when an operator has submitted an organic plan to a certifying body (applied for certification). Otherwise, the certifying body would have no way of knowing whether the apiary is under continuous organic management.

When operators holding valid certification want to add new production sites, they don't need to wait a year. Instead, they should simply list new production sites, be they fields, gardens, etc., on their annual application for certification to be inspected along with the rest of the operation. The operators must document that the new sites comply with organic standards, and include this documentation in their annual application for certification.

7.1.8.2

If prohibited substances have been used in a hive before transition, the beeswax needs to be replaced. If no prohibited substances have been used, the beeswax can stay in the hive. This exemption does not apply to any other hive product.

7.1.8.3

Once organic management has begun, beehives must be managed organically on a continuous basis. If hives are treated with an antibiotic, the hive must go through a 12-month transition period before being considered organic.

7.1.9 Introduced bees

This first sentence defines "introduced bees" (also called "replacement bees") to clarify that the standard is referring to bees only (e.g., queens) – not to the replacement of an entire colony (or nuc). If there are no organic bees available as replacements, non-organic queens can be used.

A nuc (small colony) is relatively easy to produce and is the starting point for the beekeeper to make a full hive of bees. Bees coming into an organic operation as a colony or nuc must always be produced from within the operation or come from another established organic apiary. Operators must keep accurate records for the introduction of bees coming into an organic operation from another established organic apiary.

The standard requires a 3000-metre buffer zone between the hives and GE crops and other prohibited substances including agricultural pesticides, herbicides, systemic seed treatments and sewage sludge.

Potential contaminants used by neighbouring home owners and other non-agricultural prohibited substances can be assessed as to the risk they pose to the bees and the honey. Generally, low-density rural residences within the 3000-m buffer zone may not present a significant risk if it can be established

(e.g., with an affidavit) that there is no use of prohibited pesticides or herbicides on forage plants.

Organic honey production typically cannot take place if any of the following are found within the 3000-m buffer zone:

- high-density housing areas, such as subdivisions;
- golf courses;
- garbage dumps or landfill sites;
- industrial complexes;
- very busy roads; or
- commercial non-organic greenhouses/nurseries.

There is no transition period required for the 3000-metre buffer zone. No prohibited substances, other than fertilizers, can have been applied to growing plant material within the 3000-m buffer.

The size of buffer zones can be reduced if the presence of conventional crops within the 3000-m zone is considered to pose only a minimal risk to the integrity of organic hive products; this decision must be assessed by certification agencies on a case-by-case basis. For example, bees are unlikely to collect pollen and nectar (which could be exposed to contaminants) from the conventional crops if there are (i) abundant high-quality forage throughout the season near the hives **and** (ii) natural barriers (such as forests, hills or water bodies) between the hives and the conventional crops.

A buffer zone defined by the outer perimeter of the bees' anticipated foraging area (the farthest the bees are expected to travel) might be considered to be appropriate. Within this reduced buffer zone, all the restrictions in 7.1.10 apply (i.e., no use of prohibited substances or GE crops).

7.1.11 Forage and feeding

7.1.11.1

Enough honey and pollen must be left in the hive for overwintering. If this is not possible due to weather conditions, bees can be fed organic honey or organic sugar to build up reserves.

If organic sugar or honey is not available and the hives are going to die from starvation or be seriously compromised due to the lack of organic sugar or honey, non-organic, refined sugar can be fed to the bees. However, sugar or

other products derived from GE plants (such as sugar from GE sugar beets) cannot be used, even in the case of an emergency.

Continued recourse by an organic apiarist to the exceptions 7.1.11.1 ‘a’ and ‘b’ should be cause for concern on the part of a certifying body. These exceptions are only for temporary and exceptional conditions.

7.1.11.2

Hives cannot be fed within 30 days of honey harvest.

7.1.12 Colony management

7.1.12.1

Individual hives must be identifiable with a number or mark. Apiaries must be visited on a regular basis. Operators have some flexibility regarding how often they should inspect their colonies, but should not leave an apiary alone for months at a time. Organic beekeeping requires active management.

7.1.12.2

No additional information required.

7.1.12.3

Escape-boards, shaking, brushing and forced-air blowers are acceptable for removing bees from the hive. Chemical removal is not allowed. Any substance used in conjunction with bee escape boards must be listed in the Permitted Substances Lists.

7.1.12.4

Smoke made from synthetic material is not allowed. Also, beekeepers should ensure that any materials they use in smokers are not contaminated – used burlap should be washed before being burnt in smokers.

7.1.12.5

Beehives must be managed in a sustainable manner and not destroyed each year (e.g., to avoid the cost and risk of overwintering hives).

7.1.13 Hive construction

7.1.13.1

Plastic materials are allowed if they are dipped in organic beeswax before use.

7.1.13.2

Lead-based paints cannot be used on hives. Latex paint, paraffin and linseed oil are some alternatives to lead-based paint.

7.1.13.3

Plastic foundation can only be used if it is dipped in organic beeswax.

7.1.14 Health care

7.1.14.1

Beekeepers are responsible for maintaining good hive management practices to protect bee health at all times.

This statement of principle provides the basis for managing healthy organic colonies. Above all other considerations, beekeepers should actively seek healthy and resistant stock, breed for healthy characteristics, and maintain young, vigorous queens. Organic beekeeping is not simply a matter of not using antibiotics; organic beekeepers should strive constantly to develop and maintain healthy strains of bees.

7.1.14.2

Beekeepers must maintain strong, healthy hives within the apiary.

7.1.15 Disease and pest management

7.1.15.1

An experienced beekeeper must be involved with all organic beekeeping operations. Every effort must be extended to keep beehives alive and healthy.

Organic beekeepers need to know about bees themselves, and not just about beekeeping. Organic beekeepers do not have to know everything about bees in order to begin beekeeping, but they must strive continually to improve their

knowledge over time. Though this passage may seem redundant (and difficult to enforce), the reason behind it is that beekeeping is difficult, and organic beekeeping is doubly difficult – beekeepers must therefore apply all their skills and knowledge if they hope to succeed.

7.1.15.2

This paragraph talks about queen rearing, but it does not mean that every organic apiarist needs to be an expert in queen rearing. The intent of the paragraph is that beekeepers should constantly assess their queens, and either breed their own stock or obtain good stock from a competent queen breeder. Non-organic queens can be purchased if it can be demonstrated that there are no organic queens commercially available.

7.1.15.3

Comb foundation must come from the beekeeping operation or from another organic source. Organic beekeepers need to record their attempts to locate organic foundation before procuring non-organic foundation.

7.1.15.4

This statement of principle says that beekeepers shall manage their bees to produce healthy colonies (so that they do not need to use drugs).

Pests and diseases must be controlled through good management practices.

7.1.15.5

To avoid having residue from these remedies in the honey, botanical remedies (to control pests and disease) can only be used after the last honey harvest of the season, and use must be discontinued 30 days before the addition of honey supers.

Allowable botanical compounds are listed in Table 5.3 of CAN/CGSB-32.311. Botanical compounds are those produced from plants including plant oils.

7.1.15.6

Table 5.3 of CAN/CGSB-32.311 lists materials that are permitted for use in beehives, such as formic and oxalic acid.

7.1.15.7

Antibiotics (e.g., oxytetracycline) are prohibited. However, in the case of a serious disease outbreak (e.g., American foulbrood) when hives are going to die without the use of an antibiotic, this treatment is allowed.

Prior to an antibiotic treatment, hives must be removed from the apiary. Once treated, hives must be placed in isolation and undergo a 12-month transition period. Beeswax in the treated hive must be replaced with organic wax. All treatments must be recorded in detail.

SIC Q391: Reading clause 7.1.15.7, does the term "treated hive" apply to the containers present at the time of the treatment only or does it also apply to any clean or untreated temporary containers, such as honey supers in summer time, and unused frames?

A: The term "treated hive" applies to the container(s) present at the time of the treatment, and not to supers or frames removed from a hive prior to treatment. However, the wax from any honey super frame or brood frame of the treated hive present or added during the 12-month transition period would need to be replaced with organic wax at the end of the transition period in order to return to organic production. The bees in the colonies, that is the hives plus bees, that were treated must also complete a transition period (7.1.8.1 in 32.310)

7.1.15.8

Destruction of drone cells and brood is only allowed for varroa mite control. Destroying drone brood is one of a number of management methods used to control the growth of varroa mites within a colony.

7.1.16 Extraction, processing and storage

7.1.16.1

Honey cannot be extracted from a comb containing brood. The use of dedicated honey supers and/or queen excluders will help to ensure the brood is not included with the honey harvest.

7.1.16.2

Quality and integrity rules described in 8.1 apply to honey processing. This requires organic apiarists to process their honey according to organic processing standards. The term “organic integrity” refers to the practice of not allowing any contamination of the organic product with non-organic (or prohibited) materials.

7.1.16.4

Heating of honey is limited to 35C for extraction and 47C for decrystallization. Honey heated above these temperatures cannot be labelled and sold as organic honey. It can, however, be used as an organic ingredient in a multi-ingredient organic product, such as cookies or snack bars.

7.1.16.5

Gravitational settling is accomplished by allowing the honey to settle in large tanks, sometimes for days. Most of the foreign materials will float to the top where they can be skimmed off.

7.1.16.6

The intent is to ensure that organic honey is not susceptible to contamination. Certifying bodies should allow organic beekeepers some flexibility in their choice of containers, as long as the honey is secure. Canadian Honey Regulations state that, “32. (1) Every container of honey shall be in clean, sanitary and sound condition, have a tightly fitting lid and be free from severe dents or buckling and from obvious signs of internal rusting. (2) Every container of prepackaged honey shall be new.”

7.1.16.7

Prepared products must maintain organic integrity and accurately label product composition. See 8.1 and 8.2 for details.

7.3 Mushroom production

While mushroom production has its own section in the Standard, certain clauses of the Production Standard also apply to mushroom operations. In particular, 5.1.3, 5.1.4, 5.1.6 and 5.1.7 govern parallel production and outline the responsibility of operators to protect organic crops from contamination from pest control products, fertilizers and cleaners used in adjacent conventional production. To ensure that the organic mushrooms are not mixed with non-organic mushrooms, organic varieties shall be visually distinct from non-organic mushrooms grown in the same facility.

Section 5.2.2 requires that an 8-metre buffer is established between an organic crop and non-organic crop in field production. This could apply in outdoor log production, for example, where oyster mushrooms were grown organically and shiitake mushrooms were grown conventionally. In an indoor facility, separate growing rooms for organic and non-organic would satisfy this requirement.

Section 1.4 also applies. This identifies prohibited methods and substances, such as genetic engineering, nanotechnology, irradiation, sewage sludge and synthetic growth regulators, in addition to any soil amendments and crop production aids that are not listed on the Permitted Substances Lists.

7.3.1 Production sites and structures

Each type of production site has specific restrictions to ensure the organic integrity of the mushroom production. Indoor facilities which have previously been used for industrial purposes should be assessed at the outset to ensure that there are no residues from the previous industrial activity. For example, treated wood used to construct growing beds would need to be replaced to prevent the wood treatment chemicals from leaching into the mushroom substrate.

Peat moss containing substances permitted in PSL Table 4.2 may also be used as a mushroom substrate/growth media or as a casing layer on top of a mushroom bed. For mushrooms produced in soil, a Prior Land Use Affidavit (signed statement) from the previous owner will be needed if the property has been acquired within the previous 36 months.

In forest-grown mushroom production, the operator needs to provide documents which confirm that the forest has not been managed using herbicides to control off-type trees or weeds in the understory.

7.3.2 Substrates and growth media

7.3.2.1

Wood substrates, such as sawdust for shiitake or oyster mushroom production, must be from untreated sources – for example, sawmills which produce sawdust from lumber production. Sources which recycle lumber from housing sites are likely to be contaminated with other building products, such as glues, pesticide treatments, staples, nails and/or insulation residue, or may have treated wood.

Wood substrates do not have to be composted to be used in organic mushroom production.

7.3.2.2 Compost Manure

Manure must be composted before it is used as a substrate for organic mushroom production. The requirements for composting are found in "32.311 Table 4.2 Compost produced on the farm." Compost feedstocks must reach 55C (130F) for at least four days. The pile must be mixed to ensure that all parts of the pile are heated. If temperature records cannot be kept, the compost can be tested for human pathogens and can be used if (i) the faecal coliform level does not exceed 1000 MPN/g and (ii) Salmonella levels are below 3 MPN/4g (the limits set by the CCME Guidelines for Compost Quality).

It is important to keep records of the source and identify of compost feedstocks (ingredients). If the feedstock source cannot be confirmed, the certifier may ask for a test to check for persistent herbicides.

If the compost is purchased, it must be accompanied by documents that provide the levels of heavy metals and coliform bacteria.

7.3.2.3 Other agricultural substances

"Other agricultural substances" are materials other than manure such as straw, hay and grain. Composting them is mandatory if organic sources are not used because the composting process can degrade most conventional agricultural inputs, such as herbicides and insecticides. Similarly, substances that are agricultural byproducts (such as feather meal, blood meal, or alfalfa meal) do not need to be composted before being used if it can be confirmed that they are made from organic sources.

7.3.3 Spawn

Non-organic spawn may be used if organic spawn is not commercially available. Operators need to provide documents (e.g., emails, website information) from suppliers to show they have conducted a search for organic spawn.

If non-organic spawn is used, it must be grown or treated only with substances listed on Table 4.2 or 4.3. The spawn cannot be genetically engineered. Now that a genetically engineered mushroom variety has been commercially released (with reduced browning after slicing), documentation that the spawn is non-GE is extremely important.

Spawn is supplied in formats appropriate to the type of production. Sawdust spawn consists of sterilized sawdust inoculated with mycelium. Sawdust spawn can be used to form the wooden dowels to inoculate logs or used to directly inoculate outdoor mushroom beds or pasteurized straw. Sawdust spawn may be fortified to improve yields, but only with substances that are listed on Tables 4.2 and 4.3.

Grain spawn is composed of sterilized grain inoculated with spores or mycelium. As corn is sometimes used for grain spawn, a statement from the supplier that the corn is non-GE is required.

7.3.4 Crop pest control and sanitation

Crop production aids listed on Table 4.3 can be used in mushroom production. Prevention of pests and diseases is always a prerequisite to using substances listed on the PSL.

Table salt has been added to the CAN/CGSB-32.311-Permitted Substances Lists- Table 4.3 as it is effective in stopping the spread of competing micro-organisms on the surface of the substrate.

7.3.5 Mushroom product preparation

Product preparation includes rinsing, slicing, dehydrating and packaging. Avoid practices which expose the organic mushrooms to conventional cleaners or processing aids.

7.3.6 Facility pest management

No additional information required.

7.4 Sprouts, shoots and micro-greens production

The 2015 revision includes a definition of micro-greens in Section 3 of CAN/CGSB-32.310-2015: “micro-greens” are edible young plants that are harvested later than sprouts, generally when the cotyledons are fully formed or when two or four true leaves are present.

Sprouts are marketed with the roots attached while shoots/micro-greens are cut from the root mass. Shoots and micro-greens are produced in either soil or water, whereas sprouts are only exposed to water.

7.4.1 Sprouts, shoots and micro-greens produced in water

7.4.1.1

Sprouts, shoots and micro-greens are immature plants. Non-organic seed is prohibited because immature plant tissues may contain pesticides or residues of cleaners used to clean conventional seed.

7.4.1.2

Water quality requirements apply to all stages of sprout production including rinse water. Water must be tested every six months. Municipal drinking water which has been treated with chlorine is an acceptable source.

7.4.1.3

Reports of microbial and chemical contaminant levels can be obtained from the municipality and are considered to be equivalent to an independent water testing program.

7.4.1.4

It should be understood that the growing containers used in water-based sprout/shoot/microgreen production systems, even though not mentioned specifically in the standard, must be inert (e.g., stainless steel or food-grade plastic). Containers made of agricultural materials. such as burlap, coconut coir or fibre, are prohibited.

7.4.1.5

Substances used for sanitizing seed for sprouting and sanitizing growing and harvested sprouts, shoots and microgreens shall be limited to the following Table 4.3 substances: hydrogen peroxide and peracetic acid (peracetic acid listing) and hot water (water listing).

7.4.2 Shoots and micro-greens produced in soil

7.4.2.1

Subclause 7.4.1.1 states that organic seed must be used.

Subclause 7.4.1.2 states that water sources must meet or exceed drinking water guidelines for microbial and chemical contaminant levels and must be tested every six months.

Shoots and micro-greens are exempt from Subclause 7.4.1.4 when grown in soil. This allows permitted fertilizers to be added to the soil mix to assist growth. Containers made of agricultural materials (e.g., burlap, coconut coir or fibre) and free of prohibited substances are permitted.

SIC Q: Is the soil container volume criteria outlined in 7.5.5 (32.310) applicable to containerized microgreen production (7.4)? (400)
No. 7.5.5 is applicable to containerized, staked crops grown in greenhouses. The same logic would apply to containerized staked crops grown outdoors. But this definitely does not include microgreens. Nonetheless, if substrate is used for microgreens production, it has to be soil and comply with 7.5.2, 7.5.3 and 7.5.4.

7.4.2.2

Shoots and micro-greens produced in soil are subject to the additional requirements outlined in Section 7.5 Greenhouse crops:

- If the shoots and micro-greens are grown in soil, the soil may not contain prohibited substances and at least 36 months must have elapsed since the last application of prohibited substances to the soil (7.5.1, 7.5.7).
- Supplemental heat and light are permitted as well as CO^2 enrichment of the enclosed growing chamber.
- Containers can be cleaned using substances listed on Tables 7.3 and 7.4.
- Potting soils must meet the greenhouse container soil criteria outlined in 7.5.4 and can be amended with substances listed on Table 4.2 and 4.3.
- Substances listed on Table 4.3 can be used to control disease, insects or other pests.

Soil regeneration and recycling procedures are stipulated in 7.5.12.

7.4.3 Shoots and micro-greens product preparation

Preparation may include cutting, rinsing and packaging.

7.4.4 Facility pest management

No additional information required.

7.5 Greenhouse crops

Greenhouse systems are subject to the requirements of 7.5, as well as the four stated requirements in clause 5 as follows:

Parallel production of annual crops as outlined in 5.1.4 is prohibited except for seed production and propagation or research activities.

Maintenance of a split operation (5.1.3) cannot be permanent – complete transition to organic is eventually required.

The organic portion of the greenhouse must be identifiable (5.1.6) and cannot be switched back and forth from organic to non-organic production (5.1.7).

Lastly, even though all other elements in Clause 5 were not specifically addressed in the greenhouse preamble, these too are applicable, except 7.5.12 is a crop rotation derogation for 5.4.1 a. In addition, clause 8 (Integrity)

pertains to greenhouse production systems. Clause 9 is pertinent if further processing is done.

SIC Q& A Crops grown in production shelters
Q-Is the greenhouse clause (7.5) applicable to berries grown in protective shelters? (454a)
A-Yes. All applicable requirements in 7.5 must be satisfied excluding 7.5.5 which is specific for
greenhouse vegetable crops that are containerized and staked. Please note that this topic is under
review during the 2020 revision of the standard.

7.5.1

In-ground greenhouse operations are growing systems that are connected to the ground. These need to be free of the substances prohibited by 1.4 for at least 36 months before an organic crop can be harvested (and there must be documentation to support this).

Greenhouse operators can move soil from other parts of the operation into the greenhouse as long as the soil has been free of prohibited substances for at least 36 months. However, this clause needs to be front of mind when importing soil from off the farm. Documents are needed to show the imported soil was free of prohibited substances for at least 36 months.

7.5.2

Soil mixes used in container systems cannot contain any substances prohibited by 1.4 (e.g., products of GE, products of nanotechnology, irradiated substances, sewage sludge or substances not listed in the Permitted Substances Lists).

Transition requirements (as outlined in the Organic Products Regulations)

Operators of in-ground greenhouse operations that are new to organic certification can apply for certification as soon as they like, but to achieve full organic status:

- Initial applications to a certifier have to be submitted 15 months in advance of when the first organic product is anticipated of being marketed.

- Two site inspections are required before a certification body can assess compliance to the standard and grant organic status. One of these inspections must be done while the organic crop is in production.

The requirement of 36 months from last application of prohibited substances is not pertinent to container greenhouse operations. After a certification body determines the operation meets the organic standard, organic products can be sold. This will involve at least one inspection and resolution of non-compliance issues identified by the certifier.

Existing organic greenhouse operations can expand their operations by simply informing their certifier; the certifier will determine their status and whether an additional inspection is required. Under these circumstances, no additional transition period will be imposed if no prohibited substances have been used for the previous 36 months in the expansion area. The operator will need to

7.5.3

The standard will not certify the following as organic:

- hydroponics – the cultivation of plants in aqueous nutrient solutions without the aid of soil; or
- aeroponics – plants suspended with their roots exposed to the air.

7.5.4

Soil is defined in 3.62 as a "mixture of minerals, organic matter and living organisms." This means soil mixes (*aka* growth media, culture medium, soil-less mixes, potting mixes, etc.) used in containerized organic greenhouse production must:

- contain some clay, sand or silt;
- contain organic matter;
- be alive; and
- provide the bulk of the nutrients to the plant throughout the crop cycle.

For example, a container of perlite or a slab of rockwool does not meet this requirement because it does not contain organic matter or nutritionally support a crop without fertilizers. It also is missing the necessary mineral fraction. This may be hard to comprehend as perlite and rockwall are heated forms of mineral compounds so should be acceptable as the mineral component, but the standard limits the mineral fraction to sand, silt or clay. As

another example, a mix of peat moss, coir and compost doesn't meet the requirement because it is missing the mineral fraction, even though it could support plant growth nutritionally to a certain degree.

Soil, as defined in the standard, is not required for organic plant propagation or for transplant production.

7.5.5

7.5.5 is only relevant to containerized indeterminate varieties of crops grown in greenhouses for an extended period (e.g., 7 months or more) and that are supported by a trellis system (e.g., stakes, strings or wires). 7.5.5 is not applicable to non-staked determinate varieties or crops with shorter production cycles (e.g., where harvest is finished within a period of less than 7 months).

The growing area, calculated in either square metres or feet, is the overall area available for photosynthesis. This includes both plant rows and aisles, but not greenhouse service alleys (perpendicular to the rows), header houses, staff rooms, offices, propagation houses or storage areas.

If part of the greenhouse is not occupied by crop production but has the potential for crop production, it can be excluded from the calculation for the current crop.

The 60 L/m^2 (1.2 gal/ft^2) soil volume must be maintained throughout the crop cycle.

d) Existing certified operations with soil volumes of less than the required 60 L/m^2 (1.2 gal/ft^2) may continue as is.

e) Soil volumes of 60 L/m^2 (1.2 gal/ft^2) or more are required when existing production units expand their growing area or renovate their houses.

7.5.6

Organic greenhouse production may include heating and supplemental lighting of any variety.

Supplemental nutrition (fertilization) is limited to those items on the PSL (CAN/CGSB 32.311). For in-ground greenhouses, the intent is to encourage closed-loop systems — where crop rotations and the use of green manures are

encouraged, and nutrients produced on one part of the farm (i.e., from livestock, green waste) are used as a nutritional supplement in another part (i.e., greenhouse production) as outlined in clause 5 for outdoor crop production. However, crop rotation is not required in greenhouse production (see 7.5.12).

For container operations, it may be a bit harder to comprehend but recycling (recomposting) old mixes not only reduces waste but actually could lead to production benefits, for example, by inoculating the new growing media with healthy micro-organisms.

7.5.7

Wood treated with prohibited materials (basically, all treated lumber except copper-treated lumber) may not come in contact with greenhouse plants or greenhouse soil.

For existing situations, for example, purchasing a greenhouse built with treated lumber, the operator would need to lay an impervious layer between the treated lumber and the soil.

The use of treated lumber above growing plants would also not be allowed because condensed water could drip off the treated wood and onto the plants.

7.5.8

a) This requirement is based on the organic principles of ecology and care (clause II of 32.310). Operators should embrace this requirement and certifying bodies should encourage adherence to it.

b) Greenhouse production inputs are restricted to those substances listed in clause 4 of the PSL (32.311) including Tables 4.2 and 4.3.

c) Cleaning products used in greenhouse systems must comply with clause 7 of the PSL (32.311) inclusive of Tables 7.3 and 7.4. It might be helpful to read subclause 8.2 in 32.310.

7.5.9

As mentioned in 7.5.6, all lighting is permitted.

7.5.10

Above is a list of common practices in commercial greenhouse production that are acceptable in organic operations. It should not be assumed that the examples noted are the only methods available to produce the outcomes described in a, b, c, and d. Operators may find other methods that comply with organic principles and these standards. However, other methods might not be allowed. The certification body needs to evaluate these methods on a case-by-case basis and only substances on the specified PSL tables can be used.

Energy efficiencies should be undertaken at all opportunities.

7.5.11

This subclause is not a limited list. Other methods, such as trap crops, would be acceptable on a case-per-case basis if approved by the certifying body and if only substances in PSL Table 4.3 are used.

7.5.12

It is not enough to continually add inputs (especially soluble inputs) to maximize nutrition and production. Greenhouse operators must actively put organic matter back into the soil to replace the organic matter mineralized through the years. To comply with this requirement, operators can add compost regularly to the greenhouse and/or use green manure crops. Greenhouse operators using containers are allowed to replace the soil in those containers. Ideally, the soil from the containers is re-used elsewhere on the farm (if applicable). These standards allow certifying bodies some discretion regarding crop rotation, as this practice is occasionally not feasible in high-production, high-cost operations.

7.5.13 Greenhouse crop product preparation

To maintain organic integrity during harvest and post-harvest, follow the requirements outlined in 8.1 and 8.2. Clause 9 becomes pertinent if further processing is done.

7.5.14 Facility pest management

When dealing with pests around the facility, for example rodents or silverfish, address the requirements in 8.3 of 32.310.

7.6 Wild crops

7.6.1

These wild crop requirements are specific to plants, and do not include wild animal products, such as honey harvested from wild bees. A clearly defined production area must be marked on a map so that the verification officer (inspector) can verify the limits of the harvest area.

To comply with the standards, documents are required that state that no prohibited products have been applied to the production area; these documents must come from the authority having jurisdiction over the production area. In many cases this is the provincial government, but may also involve the owners of private land. Keep in mind that certain prohibited substances, such as herbicides and fertilizer, are routinely applied to tree farms. Do not overlook aerial spraying applications, such as in the case of gypsy moth or mosquito eradication programs. There are also historical examples of injectable arsenic being trialed in forestry blocks.

NOTE: **Transition requirements**

Before organic products can be sold, wild crop operations have to apply to a certification body and meet the requirement of having a 36-month period with no prohibited substances applied to the production area. This will involve at least one inspection, and resolution of any non-compliant issues identified by the certifier.

7.6.2

Organic plans for wild crop operations need to provide (among other things) the following information:

a) detailed maps/descriptions of the harvested areas (consider supplying GPS latitude and longitude coordinates) and verifiable information regarding the use of the harvested area over the past three years.

b) details about the length of harvest, tools used, how the crop is cared for post-harvest, and where it is marketed.

c) documentation and records that ensure a sustainable harvest over time. The operators should be able to prove that their activities will not result in the degradation of the target crop, other species in the area, or the ecosystem.

7.6.3

Wild cropping is an off-farm activity and involves harvesting wild plants – not cultivated species. Wild harvesting must be done in such a way so as to be sustainable over time and in a way that will not deplete the resource.

The use of the term “relatively undisturbed” could lead to some confusion as a logged forest has been disturbed, but mushrooms growing in a logged and planted clear-cut are in a natural setting (aside from the logging that has taken place earlier). As long as the mushrooms are harvested in a way that ensures future growth (in this case, that spawn mushrooms are left behind), this type of wild harvest complies with these standards.

“Relatively undisturbed” would also prohibit the use of any substances, even permitted substances, as they could change the ecosystem.

7.6.4

Buffer zones (3.11) or some type of barrier, such as a fence or hedge, may be required to separate organic wild crops from surrounding activities, with a minimum 1-kilometre distance required to golf courses, dumps, sanitary landfills and other industrial activities. Any wild crop or crop in the buffer zone cannot be marketed as organic.

7.6.5 Wild crop product preparation

To maintain the organic integrity of the wild crop during harvest and after harvest, all handling must comply with the requirements outlined in 8.1 and 8.2. Clause 9 may be pertinent if further processing is done.

7.6.6 Facility pest management

Address the requirements in 8.3 of 32.310 when dealing with pests (such as rodents or silverfish) at the facility (e.g., weighing station, temporary storage, etc.).

8 Maintaining organic integrity during cleaning, preparation and transportation of ALL ORGANIC PRODUCTS AND PRODUCE

This clause outlines the bits and pieces of how to maintain organic product integrity from field to plate. It is applicable to all types of production systems (crop, livestock, and specialty crop), in addition to organic preparation (processing, packaging, labeling etc.,) wherever it takes place (on-farm, at processing facilities, retailers, etc.).

Elements of this clause are also applicable to operations that do not prepare, package or label but take physical possession of organic product. This includes distribution centres, warehouses and transportation companies.

8.1 Maintaining integrity

8.1.1

Food-grade materials are of higher quality than non-food-grade materials. Food-grade materials are required when handling organic food products. Food-grade material is not required for surfaces in contact with organic feed or seed (used for planting).

To demonstrate compliance with the standards, operators can provide supplier statements regarding the food-grade quality of the materials that are in contact with organic food.

See 8.1.6 for additional packaging requirements.

8.1.2

Contamination of organic products (food, feed and seed) via direct contact with incidental additives (see subclause 3.30 for a definition) not listed in the PSL is prohibited.

For split operations, the easiest solution is the use of acceptable incidental additives for both organic and non-organic; this will eliminate having to switch to permitted additives for organic runs.

If switching is not an option, consider other alternatives as described below.

For hand sanitizer substances – consider either disposable gloves or dedicated organic gloves. Remember that if the gloves are sanitized or treated with prohibited substances, they will not be compliant (i.e., permitted).

For food-contact lubricants and chemicals used in boiler systems that generate culinary steam, consider turning off the delivery mechanism before using the system for organic products and turning the system back on after the organic run. Operators need to provide data that can confirm the number of hours it takes to ensure there are no traces at the contact point/surface. A Standard Operating Procedure (SOP) will be needed to outline the protocol, and records of when the delivery mechanism was turned off and then back on will be required.

Examples:

	Direct contact with organic product	**No direct contact with organic product**
Alcohol hand sanitizer	allowed (listed in 7.3)	allowed
Iodophor hand dips	prohibited	allowed
Amine-based boiler chemical	prohibited	allowed
Potassium hydroxide boiler chemical	allowed (listed in 6.5)	allowed
Mineral oil lubricant	prohibited	allowed
Organic canola oil used as a lubricant	allowed	allowed

Even though water treatments, beyond culinary steam, are not specifically addressed in this subclause, the definition of incidental additives includes “water treatment compounds.”

This means that the water used for organic preparation may be “treated,” providing the resulting water:

· falls within Health Guidelines for Drinking Water as stipulated by EU and North America and Japan;

· has a pH of 6.5 to 8.5; and

· no substances or processes prohibited by the standard are used or added.

Examples of acceptable treatments include water softeners, ultra-violet disinfection systems and reverse osmosis filtering systems.

Do not overlook the fact that cleaners, disinfectants and sanitizers used as incidental additives also have to comply with the cleaning product restrictions in 8.2.

> *SIC Q: Is ultraviolet radiation of organic products such as milk, cheese and fruit juice acceptable under the COS? (152, 338, 419)*

> *SIC A: Near and medium ultra-violet rays are classified as non-ionizing radiation and can be used on organic products. But neither near nor medium ultra-violet rays can be used to boil (7.2.14) or sterilize (7.2.12.2) tree saps such as kitul or coconut treacle. Far ultra-violet radiation cannot be used on organic products. All forms of ultra-violet radiation can be used to sterilize packaging prior to filling.*

8.1.3

Chemical manipulation of organic products, such as hydrogenation, bleaching, hydrolysis, oxidation, denaturation, or insterification, is prohibited to minimize the development of unwanted and potentially harmful compounds.

Similarly ionizing radiation is prohibited for any purpose or at any point in the supply chain. Microwaves, ultra-violet rays and x-rays are classified as **non**-ionizing radiation and therefore are allowed with one exception. Neither microwaves nor ultra-violet rays can be used to boil (7.2.14) or sterilize (7.2.12.2) maple syrup sold as syrup or used in maple products.

Along the same lines of concern, the standards prohibit nanotechnology (1.4 b), as it is an unregulated field of endeavour with unknown risks. The concern is that the tinier the particles get, as a result of the technology, the easier these particles can pass through membranes into living tissue with unknown consequences.

8.1.4

Split operations handling both organic and non-organic products must be able to maintain separation between organic and non-organic ingredients, work-in-process (WIP), and products at all times and in all stages (especially when the products are unpackaged or loose).

8.1.5

It is not uncommon to pack, run, or process organic products on Monday mornings following a deep clean done on the weekend, or to have dedicated organic lines. These are two examples of protocols sufficient to identify, handle, and store organic runs separately from non-organic runs. But they don't work for every operation and there are additional requirements to address when your operation produces both organic and non-organic products.

Under these circumstances it is imperative:

a) there is no commingling of organic and non-organic ingredients or products throughout preparation;

b) there is proper identification on finished goods;

c) that if there are non-organic runs ahead of organic runs, cleaning records are sufficiently detailed to confirm it is impossible for there to be carryover from the non-organic run to the organic run;

d) production records are sufficiently detailed confirming the organic runs are stand-alone runs;

e) production records are sufficiently detailed confirming where each organic run occurred and recording the start and end times of each organic run;

f) that organic runs are not done at the last minute but are scheduled well enough in advance;

g) when handling commodities at high risk of being GE contaminated, such as corn and canola, extra weather-appropriate signage is needed while (i) storing, (ii) transferring, and/or (iii) temporarily holding organic and non-organic commodities at the same time.

8.1.6

Operators should choose packaging that is not excessive and yet will contain and protect their product appropriately. The packaging and the packaging manufacturing process should not itself be a source of pollution.

In the case of plastic packaging, especially for food products, consideration should be given to the type of plastic. Keep in mind that products that are highly acidic or that contain alcohol or fats can leach plastic additives from the packaging or container into the food. Operators should only use plastic containers that are approved for the particular type of food.

Operators must also verify that the final packaging materials comply with the standards and do not contain any fumigants, fungicides, pesticides or preservatives (1.4 k), and there is no intentional transfer of nano-sized particles from the packaging to the product (1.4 b).

8.2 Cleaning, disinfecting and sanitizing

8.2.1

As long as the annotation restrictions are met, all operators, on the farm or in a manufacturing facility, may use PSL Table 7.3 substances to clean, disinfect or sanitize organic product and organic product contact surfaces without having to rinse, dry, drip dry or purge the system. This includes egg washing substances. Other substances, such as essential oils, cannot be used to clean organic products because they are not listed in 32.311 Table 7.3. However botanical compounds such as essential oils may be used to clean organic product contact surfaces in accordance with 32.310 8.2.3, or if used as wetting agents (see 32.311 Table 7.4 Wetting agents).

Chlorine (at concentrations up to the levels permitted in municipal drinking water systems) is acceptable for washing organic products and contact surfaces without an intervening step. Free chlorine levels in Canadian municipal drinking water range between 0.04-2.0 mg/L (0.04-2 ppm). See the chlorine compound listing in PSL Table 7.3.

8.2.2

Cleaning products listed in 7.4 can be used on surfaces in contact with the organic product, but only after an operator can demonstrate that:

- cleaning products listed in 7.3 cannot do the job; **and**
- an appropriate removal event is employed before organic product touches the contact surface.

Rinsing, drying, drip-drying and purging are examples of effective removal events as defined in 3.59.

8.2.3

The use of cleaners that are not listed in Table 7.4 of the PSL, such as tartaric acid, is allowed when all of the following three issues are documented:

a) the operator has demonstrated that the non-listed substance, such as a quaternary ammonia or colloidal silver, is needed and effective;

b) the non-listed substance can be effectively removed from the product contact surfaces by an acceptable removal event; and

c) the operation can neutralize the non-listed substance before disposal.

Examples of “acceptable removal events” include rinsing with potable water, letting surfaces drip dry, and purging lines with organic product.

8.2.4

Adhere to the cleaning requirements in clause 7 for apiculture, maple, mushrooms, sprouts, shoots, microgreens and greenhouses if the requirements in 7 are stricter than those in 8.2.

This is most notable for maple – as all cleaning requirements are in clause 7.2. Seed cleaning for sprouts, shoots and microgreens is outlined in 7.4.

8.3 Facility pest management and post-harvest management

8.3.1

No additional information required.

8.3.2

Pest control substances in PSL Table 8.2 can be used by an organic operation if the preventative measures in 8.3.1 are found inadequate. Detailed records are required. Those substances in PSL Table 8.2 with no restrictions, such as carbon dioxide, diatomaceous earth and neem oil, may be used in direct contact with organic product.

8.3.3

Pest control substances not listed in the PSL Table 8.2 can be used both outside and inside facilities including farm buildings, on-farm storage (e.g., grain bins), and transport vehicles but only:

- when the substances in Table 8.2 have failed and this has been documented;
- if the integrity of organic products and packaging can be maintained; and
- if the operator keeps detailed records of the storage, use and disposal of the substances.

When such pest control substances are used around farm buildings and farm storage areas, it is essential that that they do not compromise organic product integrity or the surrounding farm environment.

In industrial situations where it is unlikely organic product integrity will be compromised or the surrounding environment contaminated, exterior pest control substances not listed in the PSL may be used without having to prove the lack of efficacy of the requirements in 8.3.1 or 8.3.2. However, detailed records are required.

8.3.4

No additional information required.

8.3.5

Sprout inhibitors, ripening inhibitors and ripeners listed on Table 8.3 may be used in storage facilities.

8.4 Transportation

8.4.1

No additional information required.

8.4.2

It is imperative that organic product is not contaminated by prohibited substances or commingled with non-organic products while in transit.

Clean trucks, railcars, containers, are required to prevent contamination by prohibited substances or previous shipments.

To avoid commingling:

- segregate organic and non-organic products into separate trucks;
- segregate organic and non-organic products into separate compartments in trucks;
- load only sealed boxes or crates; or
- load only shrink-wrapped pallets.

Shared loading and unloading equipment, especially for loose bulk products such as grains, oilseeds, oil and flour, must be cleaned or purged sufficiently before organic product is handled.

Shipping documentation must include the product name, organic status, lot number(s) and contact information of the responsible party.

It is recommended that the shipping documentation packet include copies of clean truck affidavits (signed by the truckers), which identify the two previous loads and identify the cleaning methods that were used.

8.4.3

Federal plant protection requirements commonly require imported agricultural products to be fumigated or irradiated depending on the source country and the condition of the goods. The fumigation is usually done at the border or in transit to Canada when a pest or disease has been detected or is of concern. Fumigating protects product against unwanted pests and helps reduce the introduction of unwanted species into the receiving country.

However, none of the most common fumigants, such as methyl bromide, phosphine and sulfuryl fluoride, are listed on the PSL – this means these are not permitted. Products treated with any of these substances or irradiated with ionizing radiation (1.4 c) will lose their organic status.

The owner of the product during transit is ultimately responsible for organic compliance.

9 Organic product composition

No matter where the product is prepared, the following rules apply when you want to make and call the product organic.

Elements of this clause are also applicable to operations that do not prepare, package or label but take physical possession of organic product. This includes distribution centres, warehouses and transportation companies.

9.1 Product composition

9.1.1

The standards restrict the use of highly processed agricultural ingredients that have been refined, hydrogenated, chemically bleached, hydrolysed, oxidized or denatured.

That said, multi-ingredient products are allowed; these may contain ingredients and processing aids as described in later parts of this clause.

Fortification with vitamins and minerals is prohibited unless required by federal regulation, which is the case for milk, white flour, meal replacements and a few other products. Non-dairy substitute products (e.g., plant-based beverages, that resemble cheese, and butter substitutes) may also be enriched. However, organic breakfast cereals, infant formulas and juice products cannot be enriched. Refer to CFIA's "Foods to Which Vitamins, Mineral Nutrients and Amino Acids May or Must be Added" and to the "Vitamins and Mineral Nutrients" listing in Table 6.4 for details.

The use of calcium compounds and Vitamin C (ascorbic acid) as acidity regulators, stabilizers, preservatives per the individual listings in Table 6.3 is permitted in any type of product.

9.1.2

Constituents refer to all the components contained in an ingredient. Every constituent or subpart of every multi-ingredient ingredient (complex ingredient), including carriers or preservatives, needs to be:

- listed in the appropriate PSL table as allowed;
- compliant with any applicable substance annotation; and
- accounted for in the organic percentage calculation.

This means the suppliers of certified complex ingredients will need to disclose the makeup of their products, including the added water and salt; otherwise the subsequent manufacturer will have to calculate the ingredient as only contributing either 95% organic content or 70% organic, according to the product's category on the supplier's certificate, and not the actual organic percentage content.

When a supplier of a ***complex non-organic*** ingredient is unable or unwilling to disclose the total makeup of their product, the ingredient is prohibited for use in organic manufacturing.

This is because not all non-organic ingredients (e.g., baking powder containing aluminum), comply with tolerances within the standard.

Processing aid constituents do not have to be evaluated for compliance, except against 1.4 a, and annotation restrictions must be addressed.

9.1.3

The term "Mahaweli H Zone Organic" and the "Knuckles Watershed Organic Logo" can be used on:

- Food products certified as containing 95% or more organic ingredients and other permitted substances; and
- Livestock feed must contain 100% organic agricultural ingredients and allowed supplements.

Food products certified as containing between 70-95% organic ingredients may only be labelled as containing "xx% organic ingredients." Food products containing less than 70% organic ingredients cannot be certified, however their organic ingredients may be identified as such in the product ingredient list.

Calculating these organic percentages has to be done consistently to sustain consumer confidence in organic labels. For consumer food products, the calculation varies depending if the product is a solid, liquid or a mixture of both as outlined in subclauses a-c.

For both food and feed calculations, the "added water"* and salt (sodium chloride) are deducted as they are not "organic" ingredients. This will also include salt substitutes used in consumer goods when the sodium-free alternative is performing the same function as that of sodium chloride.

The feed calculation also deducts calcium compounds, in addition to added water and salt, because poultry, in particular, require calcium-rich diets.

For both food and feed calculations, the organic percentage is generated as follows:

[the total of raw organic ingredients]	*minus*	[the deduction (e.g., water, salt) as described above]

———

divided by

[the total of all raw ingredients or of the finished product, whichever is more appropriate.]

Deciding which is more appropriate (the total raw formulation or the finished formulation) tends to depend on if moisture content is changed permanently from the raw to the finished state. For example, when blending teas or grinding blanched peanuts into peanut butter, there is no moisture loss or gain; therefore, the total raw formulation should be quite close to the finished product except for line losses. Baked goods, however, lose moisture and therefore it is critical to use the total raw formulation for the calculation (rather than the finished product).

*Establishing what qualifies as “added water” can sometimes be challenging as not all water is equal. If the product has a federal “standard of identity,” such as “orange juice made from concentrate” or “60% whole wheat bread,” “milk chocolate” or “mayonnaise,” and these are used as ingredients in a subsequent product, this water content is considered to be part of the ingredient core and does not need to be excluded when calculating organic percentages of the subsequent product.

When a product is made from a reconstituted ingredient and if “reconstituted from concentrate” language is included on the principal display panel, the value of the single-strength product made from the concentrate, inclusive of the water content, is used to calculate the organic percentage. If such

language is not used on the principal display panel, then the total volume of water is subtracted. If that reconstituted product is used as an ingredient in a subsequent food product, unless the final product has a “standard of identity,” the water used to do the initial reconstitution must also be subtracted out.

Added water also can be confusing when grains or seeds are “tempered” with water before processing, such as in the case of flour manufacturing and soy milk base extraction. In both situations, the total of the raw ingredients, not the finished product, is relevant.

9.1.4

No additional information required.

9.2.2 70-95% organic content

The criteria for products containing between 70-95% organic content is identical to ≥ 95% product criteria except that up to 30% of the product can be composed of:

- ingredients listed on PSL Tables 6.3 & 6.4;
- compliant processing aids; and
- non-organic agricultural ingredients that are not genetically engineered, irradiated or cloned.

Commercial availability searches do not have to be done on the non-organic agricultural ingredients accounted for in the 30%.

9.2.1 95% organic content (or more)

Up to five percent of an organic product can be composed of ingredients listed on the Permitted Substances Lists, non-organic agricultural ingredients and processing aids if ≥ 95% of the product is made up of organic agricultural or organic wild-harvested ingredients.

If and when they are used, the 5% of non-organic ingredients:

Must respect origin and usage requirements, as annotated in PSL Tables 6.3 and 6.4.

- If not listed on the PSL, must be non-organic agricultural ingredients for which the organic form is not ‘commercially available’**. Such non-organic ingredients cannot have been grown with sewage sludge,

treated with irradiation, be genetically engineered, or be (or be parts of) a cloned animal.

- Cannot have an organic equivalent in the product formulation in any form. For example, organic whole potatoes and non-organic grated potato cannot be in the same product, nor can organic Round Avacado or TJC Mango and non-organic Long Avacado and Jaffna Mango be in the same product. Another example of a product that would not be allowed is a dough conditioner containing non-organic white flour in its formulation that duplicates the white organic flour contained in the product. However, non-organic atta flour and organic rice flour would be fine if they are listed separately in the ingredient panel.

Processing aids must respect origin and usage requirements, as annotated in PSL Table 6.5 if they are non-agricultural; and if agricultural but not organic, processing aids cannot be genetically engineered, be the result of nanotechnology, have been irradiated, or have come from a cloned animal.

** An active and documented search for an equivalent organic agricultural ingredient must be completed annually before the non-organic agricultural version is used. If an organic source is available but not used, operators will need to explain why it is not appropriate. For example, operators may request to use non-organic ground filberts when organic whole filberts are readily available if they don't have the capacity to grind. An operator may request to use non-organic orange concentrate when organic orange juice is available, because the condensed form is considered necessary to deliver the desired flavour profile. Similarly, if organic liquid lecithin is called for in the formulation, but only organic granulated de-oiled lecithin is available, the operator may request to use non-organic liquid lecithin. There would have to be an issue with the quantity, or quality or variety (form) available to justify not using an organic version.

9.2 Categorization of organic products

9.2.1

Up to five percent of an organic product can be composed of ingredients listed on the Permitted Substances Lists, non-organic agricultural ingredients and processing aids if ≥ 95% of the product is made up of organic agricultural or organic wild-harvested ingredients.

If and when they are used, the 5% of non-organic ingredients:

- Must respect origin and usage requirements, as annotated in PSL Tables 6.3 and 6.4.
- If not listed on the PSL, must be non-organic agricultural ingredients for which the organic form is not 'commercially available'**. Such non-organic ingredients cannot have been grown with sewage sludge, treated with irradiation, be genetically engineered, or be (or be parts of) a cloned animal.
- Cannot have an organic equivalent in the product formulation in any form. For example, organic whole potatoes and non-organic grated potato cannot be in the same product, nor can organic Macintosh apples and non-organic Fuji apples be in the same product. Another example of a product that would not be allowed is a dough conditioner containing non-organic white flour in its formulation that duplicates the white organic flour contained in the product. However, non-organic atta flour and organic wheat flour would be fine if they are listed separately in the ingredient panel.

Processing aids must respect origin and usage requirements, as annotated in PSL Table 6.5 if they are non-agricultural; and if agricultural but not organic, processing aids cannot be genetically engineered, be the result of nanotechnology, have been irradiated, or have come from a cloned animal.

** An active and documented search for an equivalent organic agricultural ingredient must be completed annually before the non-organic agricultural version is used. If an organic source is available but not used, operators will need to explain why it is not appropriate. For example, operators may request to use non-organic ground filberts when organic whole filberts are readily available if they don't have the capacity to grind. An operator may request to use non-organic orange concentrate when organic orange juice is available, because the condensed form is considered necessary to deliver the desired flavour profile. Similarly, if organic liquid lecithin is called for in the formulation, but only organic granulated de-oiled lecithin is available, the operator may request to use non-organic liquid lecithin. There would have to be an issue with the quantity, or quality or variety (form) available to justify not using an organic version.

PERMITED INPUTS FOR COMPOST FERTILIZER AND ORGANIC SOIL AND CROP CULTIVATION NUTRIENTS

TABLE 4.2 – SOIL AMENDMENTS AND CROP NUTRITION

Agar

Extracted from red algae, agar is a gelatinous substance used as a substrate on which microbial cultures are grown. Any algal source of agar is allowed. Soy agar (TSA) has replaced agar agar in many applications. For soy agar to be used, a non-GE affidavit needs to be obtained.

SIC Q&A

Q-Can non-organic Potato Dextrose Agar (PDA) be used to propagate mycelium (the initial genetic material) to produce organic mushroom spawn? If so, can it include compounds and micronutrients that are not listed? (451)

A-Yes. Non-organic PDA is permitted if it can be demonstrated that organic is not commercially available and it does not contain GE ingredients (see Table 4.2, Agar). 2. Included compounds and micronutrients used must also be listed in Table 4.3 of 32.311 (see 32.310 7.3.3).

Alfalfa meal and pellets

Commercial availability is defined in Clause 3 as: “The documented ability to obtain a production input or an ingredient in an appropriate form, quality, quantity or variety, irrespective of cost, in order to fulfill an essential function in organic production or preparation.”
When a product is required to be organic if commercially available, a search for the organic form should be recorded before using a non-organic version of the input. Record the known sources of the organic input and the reason for not using it. Cost is not a permitted reason for rejecting the organic version. If an organic product or seed cannot be imported into Canada due to import restrictions, it would be considered to be unavailable commercially.

Algae

Amino acids

Amino acids (molecules) are the building blocks of proteins and are present in all forms of life. They are used in agriculture as chelating agents and as plant growth regulators. Most amino acids can be extracted from non-synthetic sources. It is important to ensure that the amino acid is non-synthetic and that the chemicals used in extraction are listed.

***SIC Q&A* 422 Amino acids produced by hydrolysis processes**
Q: Are amino acids produced by hydrolysis processes using sulphuric and phosphoric acid permitted?
A: No. When used in crop production, amino acids cannot be produced by hydrolysiswith using chemicals such as sulphuric or phosphoric acid. See 32.311 4.2 and 4.3 Amino acids b).

Animal manure

Animal manure, processed

The most common processing method is to dehydrate and extrude the manure into pellets. Dehydration and pelleting at 82oC is sufficient to eliminate common pathogens.
Pellets may contain other ingredients such as binders and emulsifiers which can be used if the additional ingredients are listed on Table 4.2.
Documentation of additives will be required.
Often manufacturers will not share their secret recipes unless they can obtain a confidentiality agreement in exchange. Such agreements are commonly made with certifiers. Always check with your certifier before using a commercial product.

Aquatic plants and aquatic plant products

This includes a range of products generically called seaweed meal (kelp meal, kelp extract, and liquid seaweed) which have been extracted using allowed solvents.
Substances listed in Table 4.2 can be added to seaweed-based fertilizers to create a fertilizer with a broader range of nutrients. This can include fatty acids extracted from plant and animal sources provided they are not synthetic (such as those extracted using hexane or other non-synthetic extractants). See “Extractants” in Table 4.2.

Ash

Hardwood ash is recognized as a valuable soil amendment which can provide up to 40% of the value of calcitic lime in raising the pH. Ash also contains potassium and phosphorus.
If you use ash from your woodstove, it is important to document that you do not burn coloured paper, plastics or anything other than plain paper and untreated wood.
If farmers obtain ash produced from unverifiable materials, such as forest waste burners, they will require an affidavit from the forestry company verifying that the wood waste has not been treated. Otherwise, test results will be needed to confirm that the ash does not contain levels of arsenic, cadmium, chromium, lead or mercury that exceed the maximum allowable levels as specified in the "Composting from off-farm sources" annotation.

***SIC Q&A* Testing of ash**

Q – Do all sources of ash have to be tested for heavy metals? (448a)

A- No. Ash from plant and animal sources is permitted without testing if the source is known and there is no risk of there being heavy metals in the source. Testing is required when the ash source is unknown or it is known there is a possibility of the ash containing prohibited substances. Testing is to ensure the heavy metal levels are within the limits established in the Guideline for the Beneficial Use of Fertilising Residuals.

Q- May ash from plant and animal sources not meeting the heavy metal levels limits in the Guideline for the Beneficial Use of Fertilising Residual be used in organic crop production? (448b) b)

A- No. Ash from plant and animal sources not meeting the heavy metal levels limits in the Guideline for the Beneficial Use of Fertilising Residual cannot be used in organic crop production.

Biochar

Biochar is an extremely durable form of charcoal. It takes up nutrients in soils, holds them and releases them over a long period of time. For this reason, biochar can be used as a soil amendment to rapidly improve soils that are low in carbon. It cannot be used as a soil substitute in containerized greenhouse production systems because it does not meet the requirements of a soil/growth media (32.310 7.5.4).

Biochar, sometimes called greenchar, is also used to remove toxins from contaminated sites. The toxins bind to the biochar molecules and are slowly released back into the environment over time. To avoid introducing heavy metals, dioxins and other toxic substances to the soil, biochar may only be used if it is from untreated sources.

Biochar was added to the PSL in 2015.

Biodynamic preparations for soil and plants

Biological organisms, naturally-occurring

Blood meal

Blood meal is dried, powdered blood obtained from slaughterhouses and used in agriculture as a high-nitrogen fertilizer. It is one of the most potent non-synthetic sources of nitrogen; if too much is used, it can burn plants with excessive ammonia.

To make blood meal, whole blood is centrifuged to remove foreign material and then spray-dried to give it a free-flowing consistency. Commercial manufacturing of blood meal requires a heating/drying phase to meet the definition of sterilization.

Bone meal

The Fertilizer Regulations (CFIA) of the EU and North America assure consumers that commercially labelled bone meal is not allowed to contain specified risk materials. Any bone meal offered for sale must comply with these regulations. This restriction on the use of specified risk materials is designed to protect organic farms from the spread of Bovine Spongiform Encephalopathy.

Boron

Boron is an essential micronutrient which may be present in the soil at sufficient levels but not available to plants because of certain conditions (such as dry, sandy or alkaline soils). Also, certain soils are naturally low in boron. Soil or tissue testing is recommended prior to the use of boron or other micronutrients to ensure that applications will not result in a damaging oversupply in the soil. Once an excess of boron has been created, it is very difficult to correct.

After the 2015 revision, it is possible to apply boron preventatively for boron-demanding crops like beets, cabbage family plants and alfalfa based on agronomic documents such as production guides.

Calcium

Calcium is a common mineral found worldwide and is the main component of bones, shells of marine organisms, snails and eggshells.

Calcium carbonate is the active ingredient in agricultural lime. Dolomitic lime is calcium magnesium carbonate and can be effective in amending soils low in magnesium and calcium. Slaked lime (also called hydrated lime) is not allowed as a soil amendment because it is synthetic and may have deleterious effects on soil.

Natural sources of calcium chloride are those derived from limestone. Prohibited sources of calcium chloride are those derived from the ammonia-soda process (the Solvay process).

If an operator applies calcium chloride for more than one year (even if applied using drip irrigation or spraying), soil tests will be required to demonstrate that a build-up of salts in the soil has not taken place. The restriction applies to any calcium product with the potential to cause a salt build-up.

Q384: Is calcium chloride made from the purification of naturally occurring brine allowed under
the listing of "Calcium" in Table 4.2?

A: Yes and No. Yes. Calcium chloride that is purified from naturally occurring brine via evaporation is allowed. Such calcium chloride may be used to address nutrient deficiencies and physiological disorders. No. Other purification processes of naturally occurring brine that involve additional processing steps (e.g., bromine removal, sulphur oxide addition, use of strong acid precipitation agents or lime, etc.) render the calcium chloride synthetic according to the COS (see "Mined Minerals, unprocessed" in Table 4.2).

Calcium sulphate (gypsum)

Soil tests, tissue tests or visual symptoms of disease can confirm the need for this gypsum. Only non-synthetic sources of gypsum may be used; gypsum reclaimed from drywall may contain synthetic adhesives, fire retardants and other prohibited substances.

Cannery wastes

Cardboard

Chelates

Chelates bond positively charged mineral ions, such as copper, zinc, manganese and iron, to molecules. Chelates make these nutrients more accessible to plants.

Clay

Compost

Compost is an important tool in developing long-term soil heath as it consists of not only the raw materials added to the compost pile but also the micro-organisms which biodegrade the raw materials. Nutrients from compost are released over more than one season and help build humus levels and tilth in the soil.

This annotation provides clarity on what is considered to be “on-farm” as compared to “off-farm” compost. “On-farm compost” is compost produced on the organic farm that is applying for certification. All other sources are considered “off-farm.” The relevant additional annotations are provided.

Permitted Compost feedstocks for both off site and in situ compost making

The Gazette notification must stipulate the permitted feedstocks for producing compost fertilizer and the Ministry of Agriculture must enforce strict compliance and testing of organic fertilizer that is offered to farmers by third parties and ensure fines and legal provisions for confiscation of lands and equipment used to manufacture organic fertilizer, in the event that fertilizer is tested to contain banned feedstock inputs.

Compost can be composed of:

· animal manures, carcasses and offal from slaughtering;

· plants and by-products, including forestry materials as well as source-separated yard debris; and

· soil and minerals provided they meet the requirements in this standard and 32.310.

Plant materials from non-organic agriculture or urban sources are permitted because composting can degrade GE organisms and most other contaminants. For example, residential food waste collected in biodegradable bags can be used as a compost feedstock as long as the bags and food waste decompose effectively during the composting process. The absence of petrochemical residues may need to be confirmed by testing.

Likewise, non-organic spent brewers' grains from GE sources are an acceptable composting feedstock because GE residues do not persist after the thermophilic stage of the composting process

Knowing the source of feedstocks is extremely important. While most contaminants degrade in the composting process, some contaminants are persistent. For example, the picolinic acid family of herbicides (aminopyralid, clopyralid, picloram and triclopyr) do not degrade. These chemicals can accumulate in manure and compost and have devastating effects on crops for three years following the application. These herbicides are used on hydro right-of-ways and golf courses and are rarely used in conventional agriculture settings (they are only permitted for spot applications in grain fields). The exception is where picloram is applied in conjunction with 2, 4-D as in Tordon (Dow). Also, Reclaim, which contains aminopyralid, is used to control weeds on rangeland and pastures.

If the feedstocks source suggests that picolinic acid family herbicides are likely to be present, the compost might need to be tested or documents provided that show that the herbicides were not used on the feedstocks.

Most source-separated yard debris is received in paper yard waste bags which contain coloured ink brand identification. This allowance for yard waste bags to be included in compost is a recent amendment, recognizing that urban homes can provide an important source of organic materials for organic farms.

Leaves are an example of an excellent yard waste feedstock. Papers containing coloured inks other than on yard waste bags cannot be added.

Compost from off-farm sources

Most commercial compost producers will provide a laboratory analysis of their product or a guarantee that the product meets the compost quality guidelines as specified. If compost is obtained from a non-organic farm, testing will be needed to ensure that the heavy metal content is within the CCME limits.

Compost must meet the required specifications, regardless of whether it is applied directly to the soil or blended with other ingredients. It is not necessary to test each feedstock before composting. Testing (including heavy metal analysis) is required at the end of the composting process before it is blended with any other substances, such as potting mixes, minerals, other compost, etc.

Coliform and salmonella testing can be avoided if the compost is applied as raw manure, outside of the restriction of “90/120 days to harvest” rule outlined in 5.5.2 of CAN/CGSB-32.310-2015.

Compost which is composed entirely of plant materials is known to be free of human pathogens. Therefore coliform testing is not required.

Compost obtained from off-farm sources must also satisfy the requirements for “Compost feedstocks.”

Compost produced on the farm

This annotation outlines the requirements for making compost that is:

- produced from feedstocks containing potential sources of human pathogens; and
- can be applied at any time throughout the growing season.

Many operators also employ a curing period of up to a year prior to application to allow the compost materials to fully stabilize and become a soil-like substance. Such well-cured compost is easy to apply and offers the greatest benefits to long-term soil health (although it has less of an immediate impact as a supply of readily available nutrients). Composting records are required including:

- documentation of the temperatures which the pile reaches at the various stages of composting;
- type of compost feedstocks; and
- dates and rates of compost application.

Alternatively, one may decide not to monitor compost temperature, but rather rely on coliform and salmonella testing of the compost at the end of the process.

Compost tea

Compost tea is as a source of available plant nutrients as well as a source of micro-organisms which can outcompete disease organisms present on leaves or soil.

Substances are often added to improve the tea's effectiveness, including molasses to feed micro-organisms, and a wetting agent such as yucca to help the compost tea adhere to leaves.

Additives are permitted provided that they are listed on Table 4.2 and any restrictions are respected. For example, molasses is allowed as a soil amendment only if it is organic. This means that only organic molasses can be used as an ingredient in compost tea.

Copper

A program of regular soil tests to monitor copper levels should be in place if copper products are used. High levels of copper in the soil can reduce plant growth and yields. Also, copper can accumulate in livestock forages. High levels of copper are difficult to reverse.

Digestate, anaerobic

Anaerobic digestate is the byproduct of methane digestion. Anaerobic digestate was added in 2015 as methane digesters have become common on dairy farms. The digester produces methane from animal manures and other added feedstocks. A generator driven by methane produces electricity which provides power to the milking parlour.

All feedstocks must be listed on Table 4.2 and any restrictions in the listing must be met.

Anaerobic digestate is an excellent source of very available nutrients and should be applied carefully in the same way as raw manure is applied: only when the soil is biologically active, and at a rate that is capable of being absorbed and utilized by the soil microorganisms. This prevents nutrient run-off.

Alternatively, anaerobic digestate can be harvested from the digester and placed into a holding tank where it can be composted with the addition of micro-organisms and feedstocks. The composting process can then be monitored for temperature as outlined in the “Composting on the farm” annotation.

If the temperature cannot be monitored, testing of the final product ensures that the composting process has been effective. Testing is not needed if the digestate will be applied 90/120 days before harvest as outlined in 5.5.2. Record what feedstocks are used in anaerobic digestion, and the dates and rates of application of the digestate.

Dust suppressants

Dust suppressants are added to minerals to protect workers from lung disease associated with fine particulate material. The most common dust suppressant is mineral oil. In organic applications, only non-synthetic substances or substances listed in Table 4.2 and 4.3 are allowed. Mineral oil and other

petroleum products are classed as synthetics and cannot be used. See the definition of “Synthetics” in Clause 3 of CAN/CGSB-32.310-2015.

Dust suppressants were added to Table 4.2 in 2015.

Enzymes

Enzymes are bio-molecules that can increase the rate of chemical reactions within the root zone. Almost all enzymes are proteins and are produced using biofermentation. As micro-organisms break down nutrients in the fermentation vat, they release enzymes into solution.

Farmers wishing to use enzymes as soil amendments will need to verify that the product is derived from natural substances that have not been fortified with synthetic substances.

Enzymes cannot be used if they are products of genetically engineered organisms and/or substrates. However, the restriction on GE substrates does not apply if an equivalent product from a non-GE substrate is not commercially available.

Extractants

Extractants are used to release active ingredients from plant materials. Examples include enzymes, botanical pesticides, amino acids and vitamins. Extractants must be non-synthetic except where allowed under the following annotations: Fish meal, Aquatic plants and Humates.

Feathermeal

Feathers are ground up and extruded to make feathermeal which can be an excellent source of nitrogen. When applied to the soil, decomposition time is needed for the nitrogen to become available to the plant.

Fish meal, fish powder, fish wastes, hydrolysate, emulsions and solubles

Most fish products consist of guts, fins and scales of fish harvested from the wild. These can be applied directly to the soil or processed and applied as liquid, meal or powder.

If the fish waste comes from farmed fish, it must be composted before being applied. The composting process leads to biodegradation of veterinary treatments and pool/equipment treatments. Manufactured fish by-products,

such as processed fish meals or liquid fish fertilizers made with farmed fish and/or fish farm waste, do not have to be composted before use.

Fish products often involve some processing, either dehydration to produce fish meal or liquefaction to produce hydrolysate. Note that preservatives are sometimes added to the processed fish product, only preservatives listed in Table 4.2 or 4.3 are allowed. Other additives, such as non-synthetic fatty acids, can be added if the substances are listed on Table 4.2 or 4.3.

Farmers can use any of the substances on the Permitted Substances List to adjust pH. While the standard expresses a preference, it does not prohibit the use of any of these materials. The degree of pH adjustment is not limited by the standard but cannot exceed the amount required to stabilize the pH. This is to prevent fortification of fish fertilizer with synthetic substances, particularly phosphoric acid.

Formulants

Generally, only non-synthetic formulants are allowed to be added to substances used for soil amendments. Certain synthetic formulants that are listed in annotations have been approved to be used with the listed substance. The formulants annotation was added in 2015.

Guano

***SIC Q&A* Dried deposits of guano**

Q- What is meant by "Shall be decomposed, dried deposits" in the Guano 4.2 PSL listing? Does it mean fresh dry deposits from wild bats or birds cannot be used? Or does it mean that the guano must have been decomposed in situ, not dried elsewhere? (434)

A- Wild bat and seabird guano must decompose at the site of deposit, not be dried elsewhere, and have been in place for sufficient time to decompose and dry before collection. Collection shall not impact an active colony.

Humates, humic acid and fulvic acid

Humates are subsurface mineral deposits which are found above coal seams known as leonardite. They are formed by the decomposition and compression of prehistoric plant and animal lifeforms. Humic and fulvic acids are extracted

from leonardite and applied as a source of carbon to soils to help make organic nutrients more readily available to plants.

Humus from worms and insects (vermicompost)

Inoculants

Seed inoculants offer a number of benefits, as shown in the following examples.

- Rhizobia are naturally occurring soil bacteria that can bind with legumes to establish a trade of atmospheric nitrogen for carbohydrates.
- Bacillus subtilis is a seed inoculant that offers protection against fungi which can inhibit germination in cool soils.

Mycorrhizal fungi can be used as a seed inoculant to help plants access phosphorus and other nutrients.

Iron

The iron annotation was modified in 2015 to allow sources of iron sulphate which are produced from sulphuric acid. This amendment was necessary as there are no other sources of iron sulphate.

Kelp and kelp products

Leaf mould

Leaf mould is produced by the breakdown of shrub and tree leaves and can be used as a soil amendment. Leaf mould can be added to compost, applied as mulch or dug into soil as a soil amendment.

Limestone

Magnesium

Magnesium rock can refer to any of more than 100 different magnesium compounds, such as magnesite (magnesium carbonate or dolomite) which occurs in rock formations. Dolomitic lime (dolomite) is derived from calcium-magnesium limestone.

The farmer or operator will need to demonstrate that the soil is deficient in magnesium (from soil or tissue tests or a soil consultant's recommendation) before applying magnesium sulphate. Because mined magnesium sulphate is no longer available, synthetic Epsom salts are allowed.

Manganese

Manure, composted

Manure, non-organic manure source

Meat meal

Meat meal was added in 2015 and joins three other slaughterhouse byproducts: bone meal, blood meal and feathermeal.

All commercial meat meal products are monitored to ensure that they are properly processed.

If done properly, on-farm composting of carcasses is recognized as an acceptable practice and does not pose a BSE risk to livestock.

Microbial products

These products are used for several purposes including:

- inoculating legumes before seeding (e.g., rhizobial bacteria used on soybeans or alfalfa);
- as soil amendments (e.g., mycorrhizal fungi);
- inoculating compost (e.g., yeast and effective micro-organisms) and
- other uses.

This allows for the use of any non-GE micro-organism. However, operators must provide a statement from the supplier showing that the product is not genetically engineered. A micro-organism which was produced on a genetically engineered substrate can be used if there is no alternative – that is, no commercially available product which is produced on a non-GE substrate.

Micronutrients

Milk

Milk used as a soil amendment does not have to be organic, but it must comply with 1.4 of the CAN/CGSB 32.310. Milk from U.S. non-organic cows treated with the GE hormone Recombinant Bovine Growth Hormone (rBST) would not be compliant.

Mined minerals, unprocessed

Any mined mineral that has not been processed through heating or chemical reactions, and has not been combined with synthetic chemicals can be used. An example is Spanish River Carbonatite which is extracted, milled and bagged but does not undergo any change. Each load extracted from the mine site may have a slightly different composition but meets the minimum levels of calcium carbonite, biotite, apatite and rare earth minerals listed on the label.

Minerals which have been extracted with flotation reagents are allowed given that the flotation reagents are removed from the final product.

Minerals extracted from sea water were added in 2015. These are new products that contain rare and important nutrients in a balanced form.

SIC Q 365: Does running a non-synthetic mineral fertilizer through an ion-exchange system render the mineral fertilizer synthetic? (365)

A: Yes. The use of an ion exchange system involves chemical reactions and unless specifically permitted by the PSL is prohibited. The word "combining" in PSL table 4.2 for "potassium sulphate" allows potassium sulphate that has gone through an ion-exchange system.

Molasses

Molasses can provide a carbon source to enhance plant availability of nutrients and stimulate plant growth. It is an ingredient in compost tea and is also added to soils. Even if the soil amendment is a multi-ingredient product, the molasses component must be organic.

As of 2015, it was determined that the supply of organic molasses was sufficient to remove the allowance for the use of non-organic molasses (at the time, it was permitted if organic molasses could not be found).

Molybdenum

Deficiencies can be documented through soil or tissue tests, visual symptoms or the recommendation of a soil consultant. In a few cases, molybdenum may be used to prevent a deficiency, for example, when growing cauliflower.

Mulches

Mushroom compost

Often referred to as ‘spent mushroom substrate,’ mushroom compost is the growing medium left over after mushrooms have been harvested.

Mushroom compost is made from agricultural materials, such as hay, straw, straw horse bedding, poultry litter and gypsum. Sphagnum peat moss is often added to the substrate. It is important to know the source of the mushroom compost as it may contain pesticide residues, particularly organochlorides used against the fungus gnat. Chemicals may also have been used to treat the straw and to sterilize the compost. Bags of mushroom compost sold at local garden centers do not come with guarantees that the product can be used in organic farming unless the bag carries a certifier’s logo.

Check with your certifier before using any product that is not from a certified organic mushroom farm.

Oilseed meals

As organic oilseed meals are commercially available in most parts of Canada, operators can avoid genetically engineered oilseed meals by using organic oilseeds. If organic oilseed meals are not available in your area, finding non-GE oilseed meals may be challenging as most (including soybean, canola and cottonseed meal) are made from genetically engineered crops.

If you do use a non-organic oilseed meal, be sure to obtain a statement from the supplier confirming that organic oilseed meals are not available and that the non-organic oilseed meal is non-GE. This applies even if when the non-organic meal is a component of a multi-ingredient fertilizer: an operator would need to perform a commercial availability search for a fertilizer blend that is fully compliant before using this product.

Anti-caking agents to keep non-organic oilseed meals free-flowing are not permitted unless they are listed on Table 4.2 or 4.3.

Peat moss

Peat moss that does not contain synthetic wetting agents can be used.

Peat moss that does not contain synthetic wetting agents can be used.

PH buffers

A pH buffer can be either a weak acid or base that is added to water to form a buffer solution to adjust the pH of the liquid. Use of pH buffers is common in irrigation water for transplants or for certain crops (e.g., blueberries and other acid-loving plants).

Phosphate rock

Cadmium often occurs naturally in association with mined phosphate rock. The amount of P_2O_5 used in the calculation is the total amount, not the available amount.

Plant and plant by-products

Organically produced green material can be applied directly to soils – as mulch, as trench compost, or chopped and tilled into the soil. If the green material is from a non-organic source, it can only be used if it is added to compost. Composting breaks down most toxic substances.

Plant materials can also be processed to extract the active ingredients but only non-synthetic extractants are permitted.

Pomaces

Pomace is the pulp, peel, seeds and stalks of fruit or vegetables after the oil, water, or other liquid has been pressed out.

Potassium

When looking for a mineral source of potassium, mined sources are available, as well as refined minerals such as potassium chloride and potassium sulphate.

Potassium chloride (also known as muriate of potash) is a naturally occurring potassium salt. Salt build-up can be monitored using soil tests.

Potassium sulphate also provides sulphur. Allowed sources of potassium sulphate were expanded in 2015 to include both potassium sulphate produced by evaporating brines from seabed deposits, as well as potassium sulphate created through passive ion exchange when two mined minerals are mixed. Potassium sulphate made from sulphuric acid is not permitted.

SIC Q 166: *Can potassium sulphate which has not been mined, but manufactured by combining mined potassium chloride, mined sodium sulphate and water, be used as a soil amendment in accordance with the PSL? (166)*

A: Yes. Potassium sulphate produced from combining two mined minerals is permitted (see 'd') "potassium sulphate" under the potassium listing – PSL Table 4.2); however, in general, mined minerals may not be processed or fortified with synthetic chemicals except where specifically permitted in the annotation. Potassium sulphates made using reactants such as sulfuric acid or ammonia are prohibited. (see "Mined Minerals, unprocessed PSL" Table 4.2)

Potting soil

Potting soil can be purchased or made at home on the farm. Most potting soils do not contain actual soil but instead are a mix of peat moss, sand, compost, bark, perlite and/or vermiculite. Dehydrated alfalfa or other fertilizers may be added to boost nutrients. Limestone is often added to moderate acidity. Natural wetting agents, such as yucca extracts, may be used.

Seaweed and seaweed products

Shell from aquatic animals

Chitin is the exoskeleton of insects and crustaceans. It is a major component of crabmeal and other crushed shellfish shells, which are commonly used as a soil amendment in coastal communities where shellfish is harvested. Chitosan, however, is extracted from chitin using various chemicals and is not permitted.

Soil

Soil can be used if the operator can verify that no prohibited substances have been applied in the past 36 months.

Sphagnum moss

Sphagnum moss is a highly valued ingredient in peat moss as it is able to hold up to 20 times its own weight in water. Wetting agents are used to lower the surface tension of sphagnum moss, allowing water to penetrate the substance, instead of running off. Natural wetting agents such as yucca can be used.

Stillage and stillage extract

Stillage or distillers' grains are by-products from alcohol distillation of a fermented cereal grain mash. Stillage is not allowed as a soil amendment if ammonium biflouride was added during the recovery period (to prevent unintended bacterial growth). Corn stillage as a by-product of ethanol or corn oil production would require documentation confirming that the corn was non-GE.

Sulphur, elemental
Mined (non-synthetic) elemental sulphur is permitted as a soil amendment, as well as reclaimed sources of elemental sulphur.

Sulphur is usually applied as an ion in combination with a cation (potassium sulphate, calcium sulphate, magnesium sulphate) which is a plant-available form. It takes time for the soil to break down elemental sulphur and make it available to plants. For this reason, elemental sulphur should be applied well in advance of the time when the plant needs sulphur.

Elemental sulphur is best used if the farmer also wants to acidify the soil.

Surfactants

Surfactants break the surface tension on water to disperse ingredients and they help dry materials to absorb water.

SIC Q 397: Can a compliant soil amendment contain soap? (397)

A: Yes. Soil amendments may contain soaps as soaps are listed in the "Surfactants" listing in Table 4.2. These soaps must be composed of "fatty acids derived from animal or vegetable oils".

Vermicasts

Composting or earthworm droppings are called vermicasts or worm castings.

Vermiculite

Vermiculite is a natural mineral that expands with the application of heat. Vermiculite is commonly used as an addition to potting soil to hold moisture for slow release.

Vitamins

Vitamins can stimulate plant growth but their effectiveness has not been documented. Non-synthetic vitamins are derived from plants or minerals. Synthetic vitamins are made from chemical sources.

Worm castings

Wood ash

Wetting agents

A wetting agent improves water absorbency. Saponins are soapy compounds produced by plants which can help to break the surface tension. They are sometimes used to help substances, such as compost tea, adhere to leaves. Given compost tea's ability to help prevent disease, the improved adherence will protect the plant over a longer period of time and fewer applications will be required.

Yeast

Zinc

Zinc oxide occurs in nature as the mineral zincite and can also be chemically synthesized.

Zinc sulphate is produced through a chemical process wherein sulphuric acid and zinc oxide are combined. Sulphuric acid sources of zinc sulphate are permitted as of 2015 as there are no other available sources.

A soil or tissue test confirming the need for a zinc amendment is required.

TABLE 4.3 – CROP PRODUCTION AIDS AND MATERIALS

Acetic acid

Non-synthetic acetic acid and vinegar are terms which are used interchangeably until the percentage of acetic acid in a product reaches 8%. At that point it is usually referred to as acetic acid. Non-synthetic sources include acetic acid produced through fermentation, but not methanol carbonylation, acetaldehyde oxidation or ethylene oxidation.

Acetobacter is a micro-organism capable of producing up to 20% acetic acid through biofermentation.

Operators are required to provide documentation stating that the bacteria used to manufacture acetic acid are not genetically engineered and that the substrate ingredients do not include genetically engineered plant materials. The substrate restriction is set aside if there are no commercially available alternative products which do not use genetically engineered plant materials (such as GE corn or soybeans).

Adhesives for sticky traps and barriers

Trapping pest insects using sticky traps can be effective in greenhouses and in the field. In the field, sticky traps are used primarily to monitor the pest population level and determine when additional pest control measures need to be employed. Adhesives used in sticky traps are not restricted.

Amino acids

Amino acids are the building blocks of proteins and are present in all forms of life. They are used in agriculture as chelating agents and to promote plant growth. Most amino acids can be extracted from non-synthetic sources. It is important to ensure that the amino acid is non-synthetic and that the chemicals used in extraction are listed. See “Chelates” in Table 4.3.

***SIC Q&A* 422 Amino acids produced by hydrolysis processes**
Q: Are amino acids produced by hydrolysis processes using sulphuric and phosphoric acid permitted?
A: No. When used in crop production, amino acids cannot be produced by

hydrolysiswith using chemicals such as sulphuric or phosphoric acid. See 32.311 4.2 and 4.3 Amino acids b).

Ammonium carbonate

This substance is known as smelling salts and can be used as a lure in insect traps.

Aquatic plants and aquatic plant products

This includes a range of products generically called seaweed meal (kelp meal, kelp extract, and liquid seaweed) which have been extracted using allowed solvents.

Substances listed in Table 4.2 or 4.3 can be added to seaweed-based fertilizers to create a fertilizer with a broader range of nutrients. This can include fatty acids extracted from plant and animal sources provided they are not extracted using hexane or other non-synthetic extractants. See “Extractants” in Table 4.3.

Arthropod pathogens

Spinosad is an example of an extract from a biological organism that can be used as an arthropod pathogen. Spinosad is produced by soil bacteria and is toxic to caterpillars, thrips, leafminers, spider mites, ants, fruit flies, fleas and potato beetle larvae.

Arthropod predators and parasitoids

Predatory insects, such as the two spotted stink bug or the spined soldier beetle, can effectively control many pest insects. Parasitoid flies lay their eggs in the host’s body, killing the host once the eggs hatch.

Arthropods

Insects can be released to help create a balanced ecosystem in the field or greenhouse. Lacewings, ladybeetles are examples of generalists that consume a wide range of insect eggs and/or larvae.

Ascorbic acid
(vitamin C)

Baits for rodent traps

Bentonite

Bentonite is a form of clay which can be applied as a light coating on leaves to discourage insect pests.

Biodegradable plant containers

Planting containers containing Kraft lignin can be left to decompose in soil if all their ingredients are listed in Table 4.2. However, biodegradable plant containers which contain ingredients not listed in Table 4.2, “Soil Amendments and Crop Nutrition” must be removed when the transplant is set in the soil. For example, waxes and glues are not permitted. Such containers can be reused, added to compost or disposed of through a municipal waste program.

Biodynamic preparations for compost

Biodynamic preparations can be added to compost provided they contain only recognized ingredients of biodynamic preparations.

Biological organisms

Borax

Boric acid

Boric acid is a mild acid used as an insecticide, mostly indoors. Boric acid is produced mainly from borate minerals by a reaction with sulphuric acid.

Botanical pesticides

Pyrethrum is an example of a botanical pesticide derived from plants. A plan to prevent pests is required before any pest control product can be used. The term ‘biorational’ refers to a prevention plan which uses the least toxic form of pest control.

Prevention plans include crop rotation, cover cropping, companion planting, and other crop management practices which reduce the need for reliance on pesticides.

Formulants used with botanical pesticides shall comply with PSL requirements. See “Formulants.”

A registered botanical pesticide can only be used for the purposes permitted by the registration and using the prescribed methods outlined on the label. Rotenone is a botanical pesticide, however it cannot be used for organic production in Canada, because rotenone products are no longer registered for agricultural use in Canada.

Calcium chloride

Calcium silicate

Calcium silicate, including the mined product known as Canadian Wollastonite, improves the plant's immune system and its drought tolerance. It helps produce stronger cell walls (which discourage insect pests) and helps suppress powdery mildew. Calcium silicate was added in 2015.

Calcium lignin sulphonate

Calcium polysulphide

Carbon dioxide

Carbon dioxide is a byproduct of combustion. Plants take in carbon dioxide and exhale oxygen. Any source is allowed for use in greenhouses or controlled atmosphere storage.

Chelates

Chelates are organic molecules that can trap highly reactive metal cations (including calcium, magnesium, cobalt, copper, zinc, iron and manganese) and make these nutrients more available to plants.

Cholecalciferol (vitamin D_3)

Cholecalciferol is a form of Vitamin D3 that is toxic to rodents as it affects the calcium and phosphate balance in their bodies. Section 8.3 (Facility Pest Management and Post-harvest Management) provides alternatives to the listed products.

If preventative practices are ineffective, products listed on Table 8.2 may be used. Section 8.3.3 allows additional products to be used provided there is no risk to the organic integrity of the products.

Citric acid

Most citric acid is not made from oranges but is produced from the fungus, Aspergillus niger. A. niger is fed a sucrose or glucose-containing diet to produce citric acid. The source of sugar is corn steep liquor, molasses, hydrolyzed corn starch and/or other inexpensive sugary solutions.

A. niger is sometimes genetically engineered to improve the efficiency of citric acid production, so it is important to ensure that your source is non-GE.

Citric acid is allowed as a chelating agent or can be added to a product to adjust the acidity (pH).

Copper

To avoid excessive copper accumulation in the soil, use copper products sparingly and test soils regularly to ensure that you are not exceeding safe limits.

The annotation lists several allowed uses for copper: as a fungicide, as wood preservative, and as a crop production aid (to correct nutritional deficiencies in plants).

As a fungicide, copper is a common treatment to control late blight in potatoes. Copper is also used as a spray post-harvest on apricot and peach trees to prevent blight.

Diatomaceous earth

Diatomaceous earth consists of the fossilized remains of diatoms, a type of hard-shelled algae. Contact with the fine powder leads to dehydration and death in soft-bodied insects.

It is important to check with the supplier that the DE is not heated (DE produced for pool filters is treated with heat). Check that no pesticides or synergists have been added.

Dormant oils

Dormant oils kill exposed insects and mites by either suffocating them (covering up their breathing tubes) or by directly penetrating the outside cuticle and destroying internal cells. Most dormant oils are light oils refined from crude oil. All oils manufactured for this purpose are allowed.

Dust suppressants

Extractants

SIC Q&A

Q-Evaluation of extractants For substances used in crop production, does the scope of evaluation for extractants require assessment of all materials used or only those that remain in the final product? (443)

A- For substances used in crop production, only extractants that remain in the final product are subject to evaluation, unless extractants are specifically addressed in the substance annotation.

Ferric phosphate (iron ortho-phosphate, iron phosphate)

Ferric phosphate is used as bait for slugs. Ferric phosphate cannot be used in a way that it causes run-off into rivers, lakes or ponds, or used in a way that it has contact with crops.

Fibre row covers

Formulants

A formulant is any substance or group of substances other than the active ingredient that is intentionally added to a product to improve its physical characteristics (e.g., sprayability, solubility, spreadability or stability).

Unlike active ingredients, formulants which are contained in the composition of an end-use product are not often mentioned on the product label.

PMRA List 3 formulants are generally prohibited but would be allowed if the substance is listed on Table 4.3 (e.g., an essential oil or soap) or Table 4.2 mined minerals. Otherwise their use is restricted to passive pheromone dispensers.

Growth regulators for plants

Cytokinins are a class of plant growth substances that enhance the rate of cell division and plant growth. Gibberellic acid is sometimes used in laboratory and greenhouse settings to trigger germination in seeds that would otherwise remain dormant. It is also widely used in the grape growing industry as a hormone to induce the production of larger bundles and bigger grapes, especially Thompson seedless grapes.

In the cherry industry, gibberellic acid is used as a growth regulator. Gibberellic acid produced by fermentation and extraction is considered to be non-synthetic and is permitted if produced using permitted extractants (Extractants,Table 4.2 and 4.3). Requirements with regard to substrates/growth media must be met.

Indoleacetic acid is another plant growth hormone produced in the bud region of the plant and can be used to enhance plant growth.

As with all products of biofermentation, the substrate must be non-GE if such products are commercially available.

Homeopathic preparations

Homeopathic preparations are made from plant, animal and mineral sources which are diluted and shaken vigorously (succussed) many times until all that remains is water and the life energy of the original ingredients.

Hormones

Hydrated lime

Also known as slaked lime, calcium hydroxide is formed by adding water to calcium oxide (quicklime). The most common use of hydrated lime in disease control is as part of a Bordeaux mixture, where its role is to reduce the phytotoxicity of copper sulphate.

Hydrogen peroxide

Kaolin clay

Calcined kaolin clay is used to coat fine seeds; this separates the seeds and makes them easier to sow. It is also found in plastic mulches where calcined

kaolin clay improves the thermal properties. Kaolin (often sold under the brand name Surround) is also used as a physical barrier against insect pests.

Calcination is a process which heats the clay to a very high temperature to remove any moisture.

SIC Q (386): Is calcined kaolin allowed in crop production if synthetic chemicals are added prior to calcination, such as flocculating agents, bleaching agents, and fluxes?

A: Kaolin clay, per the annotation in 4.3, cannot be processed or fortified with synthetic chemicals unless they are listed in Table 4.2 (see "Mined Minerals, unprocessed" in Table 4.2).

Lignin sulphonates

Lignin sulphonates are a byproduct of forestry pulp and paper production.

Lime sulphur (calcium polysulphide)

Magnesium chloride

The natural source of magnesium chloride is extracted from brine solutions created by ancient sea beds. The synthetic version of magnesium chloride, known as anhydrous magnesium chloride, is manufactured industrially and cannot be used.

Mulches

In addition to plant materials, wool from either organic or non-organic operations could be used as mulch.

Plastic mulches: Plastic mulches can be used if they are picked up at the end of the season. A woven polypropylene weed barrier cloth can be left in place, for example in an orchard or vineyard, for years as long as it is doesn't start to degrade. Materials made from polyvinyl chloride are not permitted.

Fully biodegradable mulches: Many farmers have grown accustomed to using mulch products marketed as biodegradable. The packaging of these products leads some customers to assume that they contain only substances which are consistent with organic principles. In fact, there are currently no fully biodegradable films on the market which meet the EU or the North American or Japanese market entry Organic Standard.

Fully biodegradable mulches may not contain any synthetic substances including petrochemicals. The formulants and ingredients must all be listed on Table 4.2 and 4.3. Restrictions apply even if substances are used as components of a biodegradable mulching material. For example, if micronutrients are embedded in the mulch, the annotation for micronutrients must be addressed. See also “Biodegradable plant containers” in Table 4.3.

The temporary exemption which allowed the use of stockpiled non-compliant products expired January 1st, 2017.

Nitrogen

Controlled atmosphere storage is a nonchemical process in which oxygen levels in sealed rooms are reduced, usually by the infusion of nitrogen gas. Temperatures are kept at a constant 0C to 2C (32F to 36F). Humidity is maintained at 95 percent and carbon dioxide levels are also controlled according to the product being stored. See “Oxygen.”

Oxygen

Peracetic (peroxyacetic) acid

Peracetic acid is produced by treating acetic acid with hydrogen peroxide. It is an ideal anti-microbial agent due to its high oxidizing potential. Peracetic acid kills micro-organisms by oxidation and subsequent disruption of their cell membrane. Any source is allowed.

PH buffers

To form a pH buffer solution, a weak acid or base can be added to water.

Pheromones and other semiochemicals

Pheromones trigger a behavioural response in another member of the same species, usually attracting the insects and keeping them from mating. A semiochemical is a generic term used for a chemical substance or mixture that affects insect behaviour; this includes pheromones, allomones, kairomones, attractants and repellents. Pheromones and semiochemicals are the only active ingredients allowed in pheromone traps; synthetic pesticides are not permitted. Also, spray applications of semio-chemicals are not permitted.

Plant extracts, oils and preparations

Clove oil was added in 2015 specifically for its ability to stop sprouting of potatoes in storage.

Plant protectants

See “Tree seals.”

Plastic for row covers and solarization

Row covers can use PVC tubing to suspend the cover over the row. PVC tubing is a stable form of polyvinyl chloride. Sheet PVC cannot be used as row covers or as sheets to solarize the soil. See “Mulches.”

Potassium bicarbonate

Potassium bicarbonate can be used to combat fungal organisms which are a major issue in greenhouses, orchard crops and grapes. Good pest control practices, such as ensuring adequate air flow and reducing humidity, are essential first steps before resorting to pest control products. See CAN/CGSB-32.310-2015-5.6.

Pyrethrum

Pyrethrum is derived from the dried flower heads of the Dalmatian Chrysanthemum (Chrysanthemum cinerarifolium) and Persian Chrysanthemum (C. coccineum). Pyrethroids, such as permethrin, are synthetic insecticides and are not permitted. Pyrethrins are often combined with a synthetic chemical, piperonyl butoxide, which is not permitted.

Quick lime

Quick lime is produced by heating calcium carbonate to at least 825^{o}C. It can be used to make whitewash used as paint on farm buildings and painted on fruit tree trunks to prevent winter sunscald.

Repellents

Sulphur smoke bombs

Sugar

Sterile insects

Releasing sterile insects can be effective in controlling populations of insect pests. The Coconut blight that affected Sri Lanka's coconuts were effectively controlled in 2012 with a bio response with the assistance of ICRAF.

Sodium silicate

Can be used to reduce post-harvest decay due to fungal organisms.

Sodium bicarbonate

Soaps, ammonium

Soaps

Soaps may contain formulants such as isopropyl alcohol, provided the formulants are listed on PMRA 4A or 4B.

Shell from aquatic animals

Chitin has been used to control root knot nematodes when applied to the soil around potato and bean seed. Chitosan is a derivative of chitin and is not permitted.

Seed treatments

Seaweed and seaweed products

Salt

Added in 2015, salt can be sprinkled on the top of the substrate to prevent disease from infecting the growing mushrooms. It cannot be used as a herbicide.

Sulphur smoke bombs

Sulphur, elemental

Surfactants

Surfactants break the surface tension on water to disperse ingredients; they also help dry out materials so they can absorb water.

Transplant and potting media

Potting soil can be purchased or made on the farm. Most potting soils do not contain actual soil but instead are a mix of peat moss, sand, compost, bark, perlite and/or vermiculite.

Dehydrated alfalfa or other fertilizers may be added to boost nutrients. Limestone is often added to moderate acidity.

Treated seed

Seed can be treated with:

- clay pelleting to make the seed flow better; and
- biological organisms (e.g., Rhizobium) to provide nutrients to the growing plant.

Seed coat ingredients are often trade secrets and manufacturers may only be willing to disclose their recipes under confidentiality agreements with certifiers. Be sure to check with your certifier before using treated seeds.

Tree seals

Tree seals can be used to protect trees from pests and winter sunscald; they can also be used as a sealant on injuries to prevent disease entering the tree.

As organic tree whips are not available in most areas, conventional planting stock treated with synthetic grafting materials and other substances not listed on the PSL can be purchased as outlined in CAN/CGSB-32.310-2015-5.3.b. The non-bearing trees must be reared organically for a minimum of 12 months before organic products can be harvested from them.

Vegetable oils

See “Plant extracts, oils & preparations” for more information.

Vinegar (acetic acid)

Virus sprays

Granulosis virus is a well-known virus spray used to combat codling moth in apple orchards.

Water

All water sources including seawater are allowed. Farmers are wise to be cautious to protect their soils from salination if salty sea water is added regularly. Soil salination can be difficult to reverse. Soil salinization is defined as an increase in salt in the soil to a level at which salt becomes toxic to plants. It can occur over time from continuous use of irrigation in dry areas or from the application of soil amendments that are high in salts.

Water, recycled

Recycled water is water that has been used on the farm to wash vegetables, irrigate crops or rinse dairy equipment. Vegetable wash water normally contains only particles of dirt but may contain chlorine residues from municipal water sources. Irrigation or flooding water that has been captured before it runs off the field normally contains only soil particles and nutrient residues. Dairy equipment wash water contains milk residues and approved cleaners.

Any off-farm sources of recycled water require a statement from the supplier identifying the ingredients. For example, run-off from conventional fields containing pesticide residues would not be accepted.

Wetting agents

A wetting agent is often added to help a substance, such as a potting soil, absorb water. Saponins are soapy compounds produced by plants which can help break the surface tension. They are sometimes added to compost tea or other foliar treatments because they allow the active ingredient in the product to remain on the surface of the leaf for a longer period of time, thereby reducing the need for multiple applications.

TABLE 5.2 – PERMITTED SUBSTANCES LISTS FOR LIVESTOCK PRODUCTION

Amino acids

L-lysine is allowed for both pigs and poultry if adequate levels of the essential amino acid lysine cannot be obtained from other feed sources. All forms of lysine HCL are non-compliant (not allowed) because of the post-fermentation chemical processing. L-lysine produced on a GE substrate is not acceptable unless it can be proven that there is no commercial alternative and there is no substrate in the final product.

Methionine is essential for weight gain, egg production and feather formation in poultry. A grain-based diet low in methionine can result in increased feather pecking. When birds are foraging on pasture, methionine is obtained from plant material and insects, but at other times it has proven difficult to source alternative organic feeds high in methionine.

If protein levels in the diet are increased to provide adequate levels of methionine, there can be excessive N excretion which in turn is problematic. Therefore an exception allows the use of synthetic DL-methionine as long as it is not a product of genetic engineering.

Antioxidants

Antioxidants help maintain the quality of the feed. Oxidation causes feed to become rancid and less palatable. The most common antioxidant used in livestock feed is ethoxyquin which is synthetic and therefore non-compliant for organic production.

Natural sources include tocopherols (vitamin E), rosemary extract, lecithin, beet juice, oregano and thyme.

Diatomaceous earth

Diatomaceous earth (DE) consists of fossilized remains of diatoms, a type of hard-shelled algae. Non-heated (food-grade) forms should be used. These are not as finely ground as the heated forms of DE powder sold for pool filters. Because of that, the non-heated forms are less likely to cause lung damage to livestock or farmers.

Energy feeds and forage concentrates (grains) and roughages (hay, silage, fodder, straw)

Enzymes

Enzymes aid the digestion and the absorption of poorly available nutrients. They help with feed efficiency when livestock are fed lower-grade feedstuffs. Carbohydrase, for example, increases the amount of energy available. Protease is effective in releasing anti-nutrients in ingredients like soybean meal; this makes protein more available. If high-quality feed is provided, enzyme supplements are not necessary.

Hay or silage preservation products

Only the substances listed above or permitted in livestock feed can be used with dry hay. For example, although salt is not specifically mentioned in this annotation, it would be allowed for hay treatment, as salt is a livestock feed.

Anhydrous ammonia is not allowed as a silage preservation agent because it is a synthetically derived substance that conflicts with Paragraph 1.4. Likewise propionic products containing prohibited compounds such as ammonium hydroxide, are not permitted. Always check with the supplier to ensure forage inoculants are not products of genetic engineering.

Micro-organisms and yeasts

The annotation applies to yeasts and yeast cell wall products used as feed supplements.

Yeast autolysate is also known as yeast extract. This is a concentrate of the soluble components of yeast cells, produced by autolysis, a process by which the cell wall is induced (mechanically or chemically) to rupture.

A yeast-derived protein is considered a protein feed and therefore must be organic.

Milk replacer

Milk replacer is a commercial product with multiple ingredients that has to be reconstituted with water before being fed. When searching for allowed sources of non-organic milk replacer, look for products that include all-milk protein (because the alternative is likely soy-based and assumed to be derived from genetically engineered soy). Ensure the product does not contain Animal Plasma Protein (a blood by-product). Milk replacers often contain animal fats, such as tallow or lard which are not permitted, but coconut oil is allowed.

Ensure that the product is non-medicated. If the label does not have all the information, it must be obtained from the manufacturer.

Milk replacer (whether organic or otherwise) cannot be used as a general part of the feeding regimen. The intent of the standard is that young mammals are fed whole organic milk (see CAN/CGSB-32.310, 6.4.3); milk replacer is to be used only in an emergency, such as the death of the dam.

It is advisable to have provisions in place for providing natural milk and colostrum to orphan animals (nurse mothers, adoption, and saving and freezing milk). At the same time, it is understood that birthing emergencies are not uncommon and that the welfare of young animals is the most important issue.

Minerals, trace minerals, elements

The most common trace minerals are iron, copper, zinc, manganese, cobalt, iodine and selenium. Non-synthetic minerals would be from naturally occurring sources (such as mined salt), while synthetic minerals are chemically manufactured. A documented search for non-synthetic sources is required before using synthetic sources.

Molasses

Pre-mixes

Pre-mixes will often include calcium, phosphorus, salt and trace minerals (including selenium) along with vitamins. They can also include probiotics.

The “commercial available” clause means that if there is no other choice, pre-mixes containing otherwise prohibited ingredients such as ethoxyquin, BHT or BHA (for preservation) can be allowed. Medicated pre-mixes are not allowed. See also listings for the individual ingredients.

Probiotics

Probiotics are micro-organisms (bacteria and yeasts) that provide health benefits when consumed. They help build immune systems to fight infection and increase the gut’s ability to absorb nutrients. Lactobacillus and Bifidobacterium are the most common examples.

An agricultural product used as growing media to produce probiotics does not have to be organic. However, a probiotic cannot be used if the growing media/substrate remains in the final product and is genetically engineered.

If the substrate was from a GE product (e.g., corn or soybean) but does not remain in the final product, it is allowed if there is no other alternative.

SIC Q: Can a non-organic agricultural substance such as whey be used as the growing media to manufacture probiotics used as a feed supplement or as an ingredient for food? (252)

A:It depends. Non-organic agricultural ingredients can be used as the growth media or substrate to manufacture probiotics used as a feed supplement or as an ingredient for food, as long as their use complies with the requirements of 32.311 5.1.2 and 6.2.1, as follows:
a) if the probiotic includes the substrates or growth media, the substrate or growth media ingredients shall be listed in PSL tables 5.2 (feed), 6.3 or 6.4 (food). If listed in the PSL, any use of non-organic agricultural substances listed in the PSL must comply with substance listing annotations;
b) if the probiotic does not include the substrates or growth media, it shall be produced on nongenetically engineered substrates or growth media, if commercially available. This means each substrate needs to be assessed individually for compliance. With regards to whey in the case where there are whey residues in the probiotic product – the product would be prohibited as whey is not listed in the required tables. In the case where there are no whey residues in the probiotic – the product would be allowed without a commercially available search as currently there is no milk being produced from genetically engineered animals.

Protein feeds

Protein feeds include oilseed meals, alfalfa pellets and corn products. Fish products would be allowed if they were from organic sources—currently none are available.

Note that mammalian and avian by-products (whether organic or otherwise) are prohibited.

Seaweed meal

Seaweed meal should not contain any added ingredients or preservatives.

Vitamins

Non-synthetic (natural) vitamins are derived directly from plants or other materials. Synthetic vitamins are made from synthesized chemicals. Check with the vitamin supplier to determine whether it is synthetically manufactured or derived directly from plants or other materials. If non-synthetic sources are unavailable, synthetic vitamins are allowed.

Feed-grade sources of fat-soluble vitamins (A & D) likely include a synthetic preservative to prevent rancidity. However, these can be acceptable if there are no alternatives.

Vitamins cannot be used for the purpose of improving meat colour.

TABLE 7.3 – FOOD-GRADE CLEANERS, DISINFECTANTS AND SANITIZERS PERMITTED WITHOUT A MANDATORY REMOVAL EVENT

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Acetic acid

Acetic acid (the main component of vinegar) is produced industrially both synthetically and non-synthetically (by bacterial fermentation). About 75% of acetic acid made for use in the chemical industry is made by the carbonylation of methanol. Non-synthetic acetic acid accounts for only about 10% of world production, but it remains important for the production of vinegar because many food purity laws require that vinegar used in foods is of biological origin.

Used as an antimicrobial and can be used to rinse or clean organic produce if from a non-synthetic source.

Alcohol, ethyl (ethanol)

This water-soluble chemical compound is effective against fungi, bacteria (in their growth phase but not spores), Mycobacterium, and certain viruses, including Norovirus.

It is not effective against spores.

It is most effective at a concentration of 60%-90% in water. Activity drops sharply when diluted below a 50% concentration.

Used as a component of fruit and vegetable wash products.

In the healthcare setting, “alcohol” refers to two water-soluble chemical compounds—ethyl alcohol and isopropyl alcohol—that have generally underrated germicidal characteristics. FDA has not cleared any liquid chemical sterilant or high-level disinfectant with alcohol as the main active ingredient. These alcohols rapidly kill (not just slow down growth) vegetative forms of bacteria but do not destroy bacterial spores. They also destroy fungi, viruses and mycobacteria.

Alcohol, isopropyl

Also known as rubbing alcohol, this is an effective disinfectant against bacteria, viruses and fungi.

This is not effective against spores. This is most effective at 60%-90% in water. Activity drops sharply when diluted below a 50% concentration.

Alcohol, organic sources

Effective against fungi, vegetative bacteria (i.e., bacteria in their growing states), Mycobacteria and some viruses, including norovirus but not effective against spores.

Most effective at 60%-90% in water. Activity drops sharply when diluted below a 50% concentration.

Ascorbic acid (vitamin C)

Common sources of non-synthetic ascorbic acid include various fruits and vegetables.

Chlorine compounds

Chlorine mixed with calcium is usually in granular or tablet form (calcium hypochlorite) and when mixed with sodium is a liquid bleach (sodium hypochlorite). Chlorine may also be available as chlorine dioxide although hypochlorites are the most active of the chlorine compounds.

Used to kill bacteria and disinfect. Used to treat pasteurizer cooling water, washing fruit, vegetables and poultry carcasses, and to disinfect food contact surfaces.

Drinking water guidelines vary by province; typical chlorine levels in Canadian drinking water distribution systems range from 0.04 to 2.0 mg/L. Operators should consult their provincial regulatory bodies. In the application of this standard, certifying bodies should require a water test of all crop or food wash water that contains chlorine compounds to confirm drinking water levels. Compliance also required for water applied to crops or flush water applied to fields.

Electrolyzed water (which may contain hypochlorous acid as a byproduct of either electrolysis or from the dissolution of chlorine compounds in water) is permitted.

Citric acid

Common commercial sources are produced industrially in cultures of Aspergillus niger, which are fed on a sucrose- or glucose-containing medium to produce citric acid. The source of sugar is corn steep liquor, molasses, hydrolyzed corn starch or other inexpensive sugary solutions. Non-synthetic sources are made by concentrating fruit sources including lemons, limes, blackberries, raspberries and tomatoes.

Used as a component of fruit and vegetable wash products.

Glycerol (glycerine, glycerin)

Used as a stabilizer of cleaning products that contain a mixture of water and oils.

Hydrogen peroxide

There are many grades of hydrogen peroxide. Food-grade hydrogen peroxide at 3% concentration is the most common for use as a sanitizing agent. Note that the food-grade label does not mean this product can be ingested. **Follow product instructions when handling food-grade hydrogen peroxide—this is a highly reactive product.**

Hydrogen water is a dilute hydrogen peroxide solution.

Ozone

Ozone is a highly reactive form of oxygen. It is a potent oxidant/disinfectant that quickly decomposes to diatomic oxygen (O_2) while reacting with targeted organic matter or micro-organisms.

Used to purify drinking water, sterilize containers for aseptic packaging, decontaminate fresh produce and preserve food in cold storage. Ozone also is useful in deodorizing air and water.

Peracetic (peroxyacetic) acid

Peracetic acid is a chemical in the organic peroxide family. It is good anti-microbial agent due to its high oxidizing potential. Peroxyacetic acid is effective against a broad spectrum of coliforms, bacteria, yeast and moulds. It is effective at temperatures from 5C to 40C and at a pH up to 8.0. It decomposes to acetic acid (vinegar), water, oxygen and carbon dioxide.

There are no restrictions on the method of production for peracetic acid.

Used most commonly in fresh-cut, further processed, and post-harvest fruit and vegetable flume and wash water systems, especially in applications where high levels of organic matter would significantly decrease the effectiveness of chlorine. Different formulations are designed to be used directly on whole and processed fruit and vegetable surfaces, on food and non-food contact surfaces, and in clean-in-place (CIP) systems. Rinsing is generally not required.

SIC Q 390: Is peracetic acid that contains synthetic acetic acid permitted?

A: Yes. Commercially, peracetic acid is produced by reacting synthetic acetic acid and hydrogen peroxide and residues of both reactants will more than likely be present. As there is no restriction in the peracetic annotation in PSL Table 7.3, peracetic acid products containing residual amounts of hydrogen peroxide and acetic acid are permitted for use in direct contact with organic products without a removal event.

Potassium bicarbonate

Sodium bicarbonate (baking soda)

Made via either the Solvay (using mined limestone) or Trona (using mined Trona ore) processes. Also known as bicarbonate of soda.

Many uses in food processing including as an effective scouring agent when mixed with water. It helps to lift baked-on cooking residues by interacting with acids in the residues.

Sodium carbonate (soda ash)

Can be extracted from the ashes of many plants growing in sodium-rich soils, such as vegetation from the Middle East, kelp from Scotland and seaweed from Spain. Because the ashes of these sodium-rich plants were noticeably different from ashes of timber (used to create potash), they became known as “soda ash.” It is synthetically produced in large quantities from salt (sodium chloride) and limestone by a method known as the Solvay process.

Used as a component of cleaning products due to its disinfectant properties, ability to cut through grease and ability to soften water. Can be found in dishwashing detergents, all-purpose cleaners, sanitizing sprays and bleach.

Sodium citrate

Used as a buffering agent in the formulation of cleaning products.

Sodium hydroxide (lye or caustic soda)

Made through the electrolysis of an aqueous solution of sodium chloride.

Used as an industrial cleaning agent where it is often called “caustic.” It is added to water, heated, and then used to clean process equipment, storage tanks, etc. It can dissolve grease, oils, fats and protein-based deposits. Surfactants can be added to the sodium hydroxide solution in order to stabilize dissolved substances and thus prevent redeposition. A sodium hydroxide soak solution is used as a powerful degreaser on stainless steel and glass bakeware.

Sodium hydroxide is sometimes used during water purification to raise the pH of water supplies. A higher pH makes the water less corrosive to plumbing and reduces the amount of lead, copper and other toxic metals that can dissolve into drinking water.

Vinegar

Used as an anti-microbial agent and can be used to rinse or clean organic produce.

TABLE 7.4 – CLEANERS, DISINFECTANTS AND SANITIZERS PERMITTED ON ORGANIC PRODUCT CONTACT SURFACES FOR WHICH A REMOVAL EVENT IS MANDATORY

Chlorine compounds

Chlorine mixed with calcium is usually in granular or tablet form (calcium hypochlorite) and when mixed with sodium is a liquid bleach (sodium hypochlorite). Chlorine may also be available as chlorine dioxide although hypochlorites are the most active of the chlorine compounds.

Used to kill bacteria and disinfect. For example, it is used to:

- Treat pasteurizer cooling water;
- Wash fruit, vegetables and poultry carcasses; and
- Disinfect food contact surfaces.

Electrolyzed water (which may contain hypochlorous acid as a byproduct of either electrolysis or from the dissolution of chlorine compounds in water) is permitted.

Detergents

There are at least 20 different compounds that may be included in a product labelled as “detergent.” The Consumer Packaging and Labelling Act covers “biodegradable” claims on products and requires that, “the product must conform with any other claims made which may, for example, relate to its type, quality, performance, function, origin, or method of manufacture.”

This annotation includes the claim “biodegradable.” This means that any product claiming to be biodegradable must actually be so. The new (2015) definition of biodegradable in CAN/CGSB-32.310 clause 3 is “capable of microbial decomposition within 24 months in soil (with the exception of plant biomass), one month in aerated water, two months in anaerobic water, with minimal impact on the environment.”

Ask suppliers for documentation that confirms that this definition is met.

SIC Q&A

Q-For detergents listed in CAN/CGSB-32.311 Table 7.4, is the OECD biodegradable definition in test 310 considered as equivalent to the biodegradable definition under CAN/CGSB-32.310 section 3.10? (446)

A- Yes. OECD 310 approvals may be used as documentation of biodegradability.

Hydrogen peroxide

There are many grades of hydrogen peroxide. Food-grade hydrogen peroxide at 3% concentration is the most common for use as a sanitizing agent. Note that the food-grade label does not mean this product can be ingested. **Follow product instructions when handling food-grade hydrogen peroxide—this is a highly reactive product.**

Iodine

Iodophors (a mixture of iodine and surfactant) have broad-spectrum activity and are effective against a wide range of bacteria, viruses, yeasts, moulds, fungi and protozoans. Although less affected by organic matter and water hardness than chlorine, iodophors have a limited effective temperature range (24°C-34°C). They are least effective at low temperatures and vaporize at 49°C. They are most effective at low pH (2.5-3.5). Iodophors have 2.5 times the oxidizing power of chlorine, so a lower concentration is required (e.g., 25 ppm). Iodophors can stain and discolour equipment, especially plastics.

Commonly used for sanitation in the meat industry.

Lime

Also known as calcium oxide, burnt lime, or quicklime. All sources are allowed for cleaning purposes as long as the material is rinsed away after use.

Phosphoric acid

Acid sanitizer commonly used in the dairy industry.

Potassium carbonate

Prepared commercially by the electrolysis of potassium chloride.

Potassium hydroxide (caustic potash)

Potassium permanganate

This salt is also known as “permanganate of potash.”

Soap-based algicide (demossers)

An algaecide or algicide is a substance used for killing and preventing the growth of algae. Numerous organic standards are the only documents in the world to refer to this substance as a “demosser.” More properly the substance refers to “moss killer,” which (obviously) is used to kill moss. Any soap-based products are allowed provided they are not fortified with synthetic pesticides in the carrier (the carrier can make up 80% of the product). Operators should check with their supplier to determine if a product is applicable.

Soaps

Soap is composed of sodium (soda ash) or potassium (potash) salts of fatty acids derived by reacting fat (animal or vegetable) with lye in a process known as saponification. The fats are hydrolyzed by the base, yielding glycerol and crude soap. Many cleaning agents today are technically not soaps, but detergents, which are less expensive and easier to manufacture.

Sodium borate

Also known as borax, sodium tetraborate, or disodium tetraborate.

Sodium carbonate (soda ash), synthetic

It is synthetically produced in large quantities from salt (sodium chloride) and limestone by a method known as the Solvay process.

Used as a neutralizing agent for the absorption of anionic surfactants.

Sodium citrate

Used as a buffering agent in the formulation of cleaning products.

Sodium percarbonate

This works in solution as if sodium carbonate and hydrogen peroxide are added separately. It is beneficial because percarbonate releases oxygen at a lower temperature, and is effective as a laundry bleach.

Sodium silicate

Used in dishwashing powders for their wetting and emulsifying properties. All silicates have excellent buffering action against acidic compounds. Silicates can inhibit the corrosion of stainless steel and aluminum by synthetic detergents and complex phosphates.

Surfactants

Compounds that lower the surface tension between two liquids or between a liquid and a solid.

Can act as detergents, wetting agents, emulsifiers, foaming agents, and dispersants. The annotation “See Table 7.4 Detergents; Soaps” should be read as “soaps OR detergents.” The nature of the product containing the surfactant or the wetting agent will determine which listing to use.

Wetting agents

The annotation “See Table 7.4 Detergents; Soap.” should be read as “soaps OR detergents.” The nature of the product containing the surfactant or the wetting agent will determine which listing to use.

TABLE 8.2 – FACILITY PEST MANAGEMENT SUBSTANCES

Ammonium carbonate

Also known as smelling salts. Used as an attractant for flies.

Baits for rodent traps

Boric acid

Boric acid is produced mainly from borate minerals by the reaction with sulphuric acid.

Used as an insecticide for control of cockroaches, termites, fire ants, fleas, silverfish and many other insects. It acts as a stomach poison affecting insect metabolism, and the dry powder is abrasive to insect exoskeletons.

Carbon dioxide

Used to kill insects in sealed containers storing vegetables, grain or fruit; it is not harmful to humans who later consume these foods.

Cholecalciferol (vitamin D_3)

Cholecalciferol is a form of Vitamin D, also called vitamin D_3. It is toxic to rodents by affecting calcium and phosphate homeostasis in their bodies. Vitamin D is essential in minute quantities. Like most fat-soluble vitamins, it is toxic in larger doses (causing hypervitaminosis). Severe poisoning can be fatal.

Diatomaceous earth

Diatomaceous earth (DE) is a powder made from fossilized hard-shelled algae called diatoms. When in contact with an insect that has an exoskeleton (such as an ant), the sharp edges of DE cut into insect's body causing it to die of dehydration. Diatomaceous earth is most useful in dry situations — for example, puffing it into crevices where cockroaches have been seen.

Be sure to use a food-grade quality DE.

Neem oil

Neem oil is extracted from the fruit and nuts of the neem tree. There are currently no neem products currently registered for pest control in Canada. Neem oil has been added to the PSL in order to facilitate acceptance of foreign products.

Pheromones and other semiochemicals

A pheromone trap is a type of insect trap that uses pheromones to lure insects. Sex pheromones and aggregating pheromones are the most common types used. A pheromone-impregnated lure is encased in a conventional trap such as a Delta trap, water-pan trap or funnel trap.

Pyrethrins

A class of organic compounds normally derived from Chrysanthemum cinerariifolium, which have potent insecticidal activity by targeting the nervous systems of insects. Pyrethrin can be made synthetically by industrial methods, but it also naturally occurs in chrysanthemum flowers. The insecticidal and insect-repellent properties of the flowers have been known and used for thousands of years.

Soaps, ammonium

A product from reaction of a fatty acid with ammonium hydroxide.

TABLE 8.3 – POST-HARVEST SUBSTANCES

Carbon dioxide

Used in combination with other gases such as oxygen and nitrogen to modify the gaseous composition of the atmosphere in which food products are stored.

Clove oil

Distilled directly from the evergreen plant *Syzygium aromaticum*. The plant is native to Indonesia but is now grown in several other countries including Madagascar and Brazil. The active ingredient of clove oil is eugenol and other eugenol-based components in the distillate product. Due to the chemistry and volatility of clove oil, it can be applied with a thermal applicator and distributed throughout the storage facility.

Ethylene

Made by converting large hydrocarbons into smaller ones and introducing unsaturation. Ethylene is then separated from the resulting mixture by repeated compression and distillation. Global commercial production of ethylene exceeds that of any other organic compound.

Used to control the conditions of fruit in storage (such as bananas) in order to manage the timing of when it will be ready for retail sale.

Nitrogen

Used in combination with other gases, such as carbon dioxide and oxygen, to modify the gaseous composition of the atmosphere in which food products are stored.

Oxygen

Used in combination with other gases, such as carbon dioxide and nitrogen, to modify the gaseous composition of the atmosphere in which food products are stored.

Repellents