Biodynamic® Farm Standard

MARCH 2023



Photo by Johan Vineyards

CERTIFIED BIODYNAMIC®

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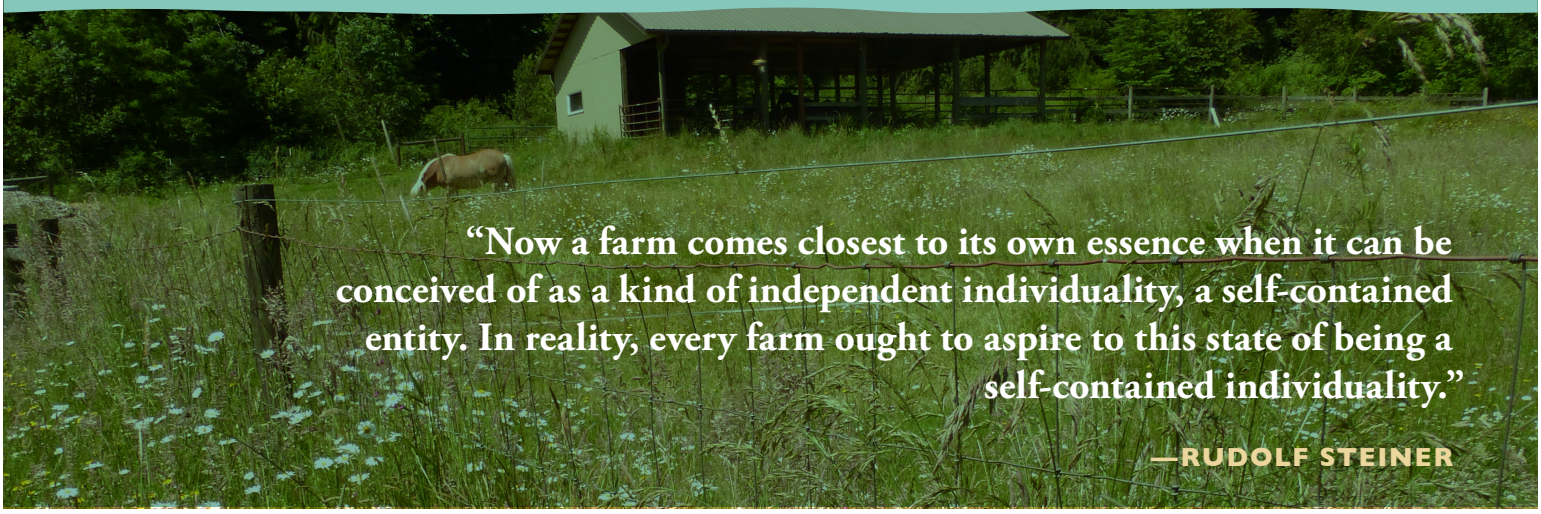
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Introduction



Biodynamic Principles

A foundation of the Biodynamic method of farming is a Goethean observation of nature and its application to a farming system. This encourages a view of nature as an interconnected whole, a totality, an organism endowed with archetypal rhythm.

Biodynamic farming involves managing a farm utilizing the principles of a living organism. A concise model of a living organism ideal would be a wilderness forest, where there is a high degree of self- sufficiency in all realms of biological survival. Fertility and feed arise out of the recycling of the organic material the system generates. Avoidance of pest species is based on biological vigor and its intrinsic biological and genetic diversity. Water is efficiently cycled through the system.

While agriculture takes nature to a state that is one step removed from wilderness, the wisdom of the farmer that guides its course can reflect these ancient principles of sustainability. The view of the farm organism extends beyond the fence line and includes the tangible and intangible forces that work through it. Examples include the climate, inherent wildlife of the earth (above and below the ground), the light and warmth from the sun, and the more distant astronomical influences. Biodynamic agriculture attempts to harmonize all these factors within a holistic, living farm system. The food that results is very pure and true to its essence and provides deeply penetrating nutrition that is essential to an increasingly unhealthy human population.

History

This special body of knowledge is derived from Dr. Rudolf Steiner's "Agricultural Course," held in 1924, when a group of European farmers approached Steiner (noted scientist, philosopher, and founder of the Waldorf School) after noticing a rapid decline in seed fertility, crop vitality, and animal health. In response, Steiner held a series of lectures that presented the farm as a living organism: self-contained and self-sustaining, responsible for creating and maintaining its individual health and vitality. This was in sharp contrast to the view of the farm as factory, boosting production by importing chemical pesticides and synthetic fertilizers, that was largely responsible for the observations of depleted vitality noted by the farmers who sought Steiner's guidance. Steiner was one of the

first public figures to question the long-term benefits of this manufacturing view of agriculture and to warn of its environmentally destructive practices.

In 1928, following Steiner's lectures, Demeter was formed in Europe to codify his farming principles in the Demeter Biodynamic Farm Standard and commenced ensuring that it was uniformly applied and monitored through a strict certification process. The *Biodynamic Farm Standard* is historically significant because it dates to before the beginning of the modern sustainable agriculture movement and captures key agronomic principles not comprehensively addressed within any other agriculture certification system.

Biodynamic Practices

In day-to-day practice, the goal is to create a farm system that is minimally dependent on imported materials, and instead meets its needs from the living dynamics of the farm itself. It is the biodiversity of the farm, organized so that the waste of one part of the farm becomes the energy for another, that results in an increase in the farm's capacity for self-renewal and ultimately makes the farm sustainable.

This requires that, as much as possible, a farm be regenerative rather than degenerative. Carefully consider materials that are imported onto the modern-day organic farm. Where do they come from? Often, they can be tracked back to a natural resource provided by the earth. Examples include petroleum to move materials around, ancient mineral deposits, by-products of unsustainable agriculture-related industry, and the life of the seas and waterways. An important social value of Biodynamic farming is that it does not depend on the mining of the earth's natural resource base, but instead emphasizes contributing to it.

Sections of the *Biodynamic Farm Standard* include necessary elements of the farm organism, soil fertility management, crop protection, greenhouse management, animal welfare, and the use of the Biodynamic preparations. Biological diversity within the farm landscape is emphasized and requires that a minimum of ten percent of the total farm acreage be devoted to biodiversity preservation and enhancement. That may include but is not limited to forests, wetlands, riparian corridors, and intentionally planted insectaries. Diversity in crop rotation and perennial planting is required: no annual crop can be planted in the same field for more than two years in succession. Bare tillage year- round is prohibited, so land needs to maintain adequate green cover.

The *Biodynamic Farm Standard* instructs that the foundation of the fertility system, and strategies for disease, insect, and weed control, must originate from the farm itself. Fertility is generated via the integration of livestock, compost and green manure, nutrient catch crops, and careful crop rotation. Disease and insect control are addressed through botanical species diversity, predator habitat, balanced crop nutrition, and attention to light penetration and airflow. Weed control emphasizes prevention, including timing of planting, mulching, and identifying and avoiding the spread of invasive weed species.

The use of the Biodynamic preparations is a requirement of the *Biodynamic Farm Standard.* There are nine in all, made from herbs, mineral substances, and animal manures that are utilized in field sprays and compost inoculants applied in minute doses, much like homeopathic remedies are for humans. Timely applications revitalize the soil and stimulate root growth, enhance the development of microorganisms and humus formation, and aid in photosynthetic activity.

Animals are a crucial element of a Biodynamic farm, and in addition to their obvious contribution to a farm's

fertility, their care and welfare are given extensive consideration. Housing must allow animals to move freely and protect them from heat, dust, excess humidity, and harmful gasses such as ammonia. Poultry cages are prohibited; every animal must be given a dry, soft, and insulated spot where it can lie down and rest; and access to free-range forage and the outdoors is required. De-horning, de-beaking, and wing clipping of poultry are prohibited, as is tail cutting of piglets and docking of lambs. Homeopathic remedies in place of vaccines are strongly recommended, and the use of antibiotics is prohibited. If an animal is being raised for the sale of meat, eggs, or milk, at least half of their feed must come from the farm (60% minimum for ruminants, *Equidae* and *Camelidae*). A minimum of 70% of the total ration for ruminants and 50% for pigs and poultry must be Demeter certified, and the remainder must be NOP-certified organic at minimum.

Relationship to National Organic Program (NOP)

Biodynamic farming is free of synthetic pesticides and fertilizers in the same manner as certified organic farming. To qualify for Demeter Biodynamic certification, a farm must first meet the requirements of NOP organic as a base, but some inputs permitted by the NOP are not permitted or use is further restricted by Demeter. Demeter also requires a careful examination and eventual reduction of the volume of imported materials necessary to sustain the life of the farm.

Environmental Message

Agricultural land occupies 50% of the earth's habitable surface, about 41% of U.S. land. In the U.S., food production contributes 34% of total greenhouse gas emissions. Concerns of climate change cannot be successfully addressed without addressing agriculture's contribution to it, but, conversely, agriculture can be a potent solution.

Because the underlying theme of the *Biodynamic Farm Standard* is to generate inputs out of the life of the farm system itself rather than importing them from outside, the heart of a Biodynamic farm's fertility system is the sequestering and recycling of carbon. Crop rotation and integration of animal agriculture also assist in reducing petrochemical inputs compared to conventional agricultural practices. These factors, in addition to Biodynamic farming's focus on improving soil health, water quality, and biodiversity, combine to make it one the highest paradigms of sustainable, regenerative agriculture. Demeter's vision is to heal the planet through agriculture.



Principle of Social Responsibility

Social responsibility, which includes respect for and observance of human rights, is one of the basic principles of the Demeter standards. The labor laws in the United States are valid for all people and govern all human

resource relations also in Demeter certified enterprises. People working on a Demeter operation receive equal opportunities independent of their ethnic background, creed, and gender.

Management of Demeter certified enterprises have policies in place to address the health and security of the workers. All co-workers have the possibility to avail themselves of their rights. They have the right to congregate, to participate in collective bargaining and to make representation to management without discrimination. Demeter enterprises have to eliminate social inequity, including lack of social rights, forced or inappropriate child labor, and below-standard working conditions and/or wages, and to provide occupational safety and healthy working environments. The enterprise has to inform the workers about their rights.

As part of the annual inspection and certification process all licensees shall make a self-declaration in their Biodynamic System Plan or separately confirm that these guidelines have been met.

Demeter Today

Biodynamic Federation Demeter International is the only internationally recognized Biodynamic certifier and consists of a network of individual certification organizations in 45 countries around the world. Demeter Association, Inc. is the Biodynamic certification organization in the United States.

Demeter was established in 1985, and its mission is to enable people to farm successfully in accordance with Biodynamic practices and principles. Demeter is the owner of the trademarks (certification marks) "Biodynamic®" and "Demeter®", and the related logos using these marks, and is therefore solely responsible for ensuring that farms and products referred to as "Biodynamic" meet the *Demeter Biodynamic Farm and Processing Standards*. No agriculturally based product or farm may be legally referred to as Biodynamic without having achieved Demeter certification. For more information about the Demeter certification process, please refer to Section VI: "Administration".

DEMETER

CERTIFIED BIODYNAMIC®

SECTION I

Agronomic Guidelines

A. Necessary Elements of the Farm Organism

1. BIOLOGICAL DIVERSITY

A Demeter certified farm must have a minimum of 10% of its total effective land base—clearly documented in a calculated acreage figure—set aside as a biodiversity reserve. This preserves wildlife diversity and endangered species habitat and provides an overall reserve of diverse life forms to inoculate and inhabit the farm organism.

Environmentally beneficial grazing [in compliance with Section I.E.5] and low-impact wild harvest can take place, but each situation will be handled on a case-by-case basis. In situations where there is no potential biodiversity reserve occurring naturally, areas will need to be created.

All botanical species established (natural or planted) at a minimum need to be allowed to develop through the flowering stage to be counted towards the 10%. Examples include insectary plantings, hedgerows, flowering cover crops, perennial plantings along fence lines and roadways, and wildlife corridors. For climates with a winter dormant period the 10% biodiversity reserve requirement applies throughout the entirety of the growing season (Spring through Autumn). For climates with growth year-round the 10% biodiversity reserve needs to be in place year-round.

The clearance of virgin forest for agricultural usage is forbidden. Other conservation areas of high ecological value must also be protected.

Tillable acreage cannot be planted only to a monoculture. Botanical species diversity needs to be maintained via the crop rotation strategies utilized.

In annual crop rotations, a given harvested commodity cannot be planted in the same field for more than 2 years in succession. Close attention needs to be paid to the nutrient export associated with each harvested commodity. The crop should not return to a given field until there has been adequate time to return exported nutrients to the soil in a manner consistent with these standards.

Bare tillage year-round is prohibited. Soil carbon (i.e., humus) levels must be maintained and ideally increased over time. During the growing season, tillage must be kept at a minimum, avoiding bare exposed soil for long periods of time. Frequency and type of tillage will be documented in the Biodynamic System Plan or other form of documentation. Each year at least 20% of annual and perennial cultivated areas must include a soil building crop such as sod, pasture, cover crops and green manures. Within the fabric of this Standard are requirements to implement the following vegetative cover techniques **before** importation of inputs are permitted. Also see sections on:

Fertility Management

- Integration of livestock (pasture and fodder)
- Green manures
- Legumes/nutrient catch crops
- Crop rotation

Disease and Insect Control

- Botanical diversity
- Predator habitat
- Crop rotation

Weed Control

- Shade/crop canopy
- Mulching
- Grazing

Water and Waterway Conservation

- Mulching
- Development of soil organic matter

Soil must be protected from soil erosion and soil structure degradation during periods of the year when it is vulnerable. Adequate crop residue and, at a minimum, volunteer vegetative cover must protect all fields of cultivation during these periods (for example winter months, rainy seasons, etc.).

2. GENERATING FERTILITY

The foundation of the fertility system needs to be based on strategies that emphasize generating fertility from within the life of the farm. When applicable, the following techniques need to be demonstrably utilized to their maximum potential for a farm to import allowed fertility materials. There are also limitations on the amount of fertility that can be imported and applied. [See Section I.B]

- Livestock integration
- Green manure
- Legumes/nutrient catch crops
- Biodynamic preparations
- Crop rotation

In market gardens, about 1/3 of the crop acres must grow a green manure, green fallow, and/or fodder production in a given year. This requirement does not apply to farms smaller than 5 acres (land in vegetable production), although it is encouraged.

3. DISEASE, INSECT, AND WEED CONTROL

The foundation of disease and insect control needs to be based on strategies that emphasize prevention located within the life of the farm itself. When applicable, the following techniques need to be demonstrably utilized to their maximum potential for a farm to import pest control materials. [See Section I.D.1]

- Botanical species diversity
- Predator habitat
- Balanced crop nutrition
- Attention to light penetration and airflow
- Biodynamic preparations
- Crop rotation
- Timing of planting/understanding of pest species life cycle

The foundation of weed control needs to be based on strategies that emphasize prevention located within the life of the farm itself. When applicable, the following techniques need to be demonstrably utilized to their maximum potential for a farm to import weed-control materials (including petroleum-to-run tractors). [See Section I.D.2]

- Timing of planting/understanding of weed species lifecycle
- Shade/crop canopy
- Mulching
- Crop rotation
- Identifying and avoiding the spread of invasive weed species
- Grazing
- Irrigation strategies

4. USE OF THE BIODYNAMIC PREPARATIONS

The full complement of the Biodynamic preparations 500- 507 must be used. [See Section I.C]

5. WATER AND WATERWAY CONSERVATION

Irrigation needs are required to be met based on strategies that emphasize water conservation. The following water conservation measures need to be demonstrably utilized to their maximum potential:

- Development of soil organic matter
- Mulching, in instances where mulching can be practically applied
- Efficient irrigation delivery systems where such systems can be practically applied
- Alternative pumping methods, such as solar pumps, nose pumps, or wind pumps are considered
- The performance of irrigation system equipment is routinely monitored to verify motors, pumps, and delivery systems are performing well and according to specifications
- Irrigation scheduling takes into consideration crop requirements, daily rainfall amounts, soil types, and evapotranspiration rates for the area
- Soil moisture is monitored to improve irrigation efficiency to avoid excessive water application

Waterways (applies to U.S. farms with fish-bearing waterways)

When irrigating from native fish-bearing waterways, the following needs to be considered:

- Installing fish screens on diversions in accordance with appropriate state department of fish and wildlife or other similar guidance specific to the farm's geographic location
- Avoiding channel manipulations that could negatively impact native fish populations
- Work on diversions, including installing and servicing pumps and intakes, is conducted when sensitive native species are not present
- If in-stream work is done when there is water in the stream, in-stream sediment control and containment measures to prevent excessive sediment and construction debris from entering the water way
- Irrigation ponds should not have adverse impacts on stream temperature and water quality



Riparian, wetland, and upland vegetation protection (applies to U.S. farms with fish-bearing waterways)

When year-round or seasonal waterways that are important habitat for native fish populations are present on the farm, the following needs to be considered:

- Riparian zones or cultivation setbacks of year-round and seasonal waterways, potentially harboring native fish, are adequately vegetated and a minimum width of 35 feet.
- Wetlands are protected and wetland buffers established to the greatest extent operationally feasible. Wetland protection is prioritized to provide off-channel salmon habitat, improved water quality, additional floodplain storage, and/or other habitat benefits associated with proper wetland function. In dedicated agricultural production areas, wetlands are protected by a minimum 25-foot uncultivated buffer to the greatest extent operationally feasible.

6. LIVESTOCK INTEGRATION

The integration and maintenance of livestock is an invaluable tool of Biodynamic farm management. Within the context of the farm individuality and ecology, the grower should strive to have a mixed livestock population to help establish and sustain a self-sufficient system of fertility. In situations where the presence of only a small number of livestock is possible, it is recommended that a cow be present to provide the manure for making Preparation 500 on the farm.

Wherever possible, the Demeter Association supports the principle of integrating livestock back into agronomic systems, versus separating livestock from the land in large industrial feedlots. Their contribution to the fertility dynamics, crop rotation, and vitality of a farm is significant. Certifying a livestock product to the Demeter standard is not something that is easy to do, and it takes significant long-term focus to bring a farming system to a place where livestock certification is possible. It is recognized that many folks who sincerely want to integrate livestock into their farming system do not have the land base and other resources available to meet the Demeter standard for certified livestock products (see Livestock Standard below). For this reason, Demeter will allow exemptions not requiring livestock on Demeter farms to be certified to the Demeter standard. The land base on which the

animals reside is ***not*** exempt from the requirements of the *Biodynamic Farm Standard*. When imported animals are introduced to the farm, care must be taken to ensure that they have not recently been treated with any prohibited materials, to ensure that their manure does not contaminate the farm.

Not having livestock on the farm, and having livestock on the farm that are not managed fully to the Demeter Standard, require approved exemptions. In situations when there are animals not certified to the *Biodynamic Farm Standard* on a farm, how these animals are managed needs to be considered. Attention must be paid to humane handling of the animals while they reside on the farm. Also, attention must be paid to avoiding contamination of production land with residue of materials such as veterinary treatments and wormers.

To fulfill the livestock integration requirement, the following criteria must be met:

The minimum stocking rate for agricultural farms with less than 25 acres (based on the total area under production) must not fall below 0.02 livestock units/acre.

The minimum stocking rate for agricultural farms with more than 25 and less than 99 acres (based on the total area under production) must not fall short of 0.05 livestock units/acre.

The minimum stocking rate for agricultural farms with more than 99 acres (based on the total area under production) must not fall short of 0.1 livestock units/acre.

A livestock unit is 1000 lbs. animal weight. Maximum stocking rates can be found in Appendix F.

If these criteria are not met, an annual exemption must be requested that explains the reason for not fulfilling the livestock integration requirement.

An operation requesting an exemption from having livestock must bring in farmyard manure, which must be composted before use, or composted manure from other holdings (see Section I.B.2 for composting requirements) or provide a detailed plan for enhancing the wildlife presence on the farm. The quantity must be equivalent to at least 9 lbs. N/acre/year. Where bringing in farmyard manure is not possible or practical, the 9 lbs. N/acre/year must be provided by cover crops or other plant or animal composts. All brought in compost materials must meet the requirements of Appendix B.

7. GENTLE POST-HARVEST HANDLING

Agricultural production is minimally manipulated after it has been harvested. See *Demeter Biodynamic Processing Standard* for more information.

B. Soil Fertility Management

1. GENERAL PRINCIPLES

The aim of Biodynamic fertility management is to generate a farm's fertility from within the farming system itself, rather than importing inputs from the outside. This generally involves the recycling of raw organic materials generated on the farm with the goal of developing soil humus and the related biological activity that such a process ignites.

Examples of self-sustaining fertility dynamics include:

- Use of legumes in crop rotation (pulls nitrogen from the air and incorporates it into the farm's fertility cycle; helps to mobilize phosphorous; builds soil humus)
- Sod in crop rotation (builds soil humus)
- Recycling livestock manures via composting and pasture management (concentrates numerous crop nutrients/ minerals and recycles them back into the farm; builds soil humus)
- Green manure plow down crops (builds soil humus; supplies concentrated levels of various crop nutrients)
- Care in planning crop rotation that avoids excessive and continual loss of crop nutrients in levels that exceed the farm's ability to replenish them
- Increasing biological activity of soil and catch cropping to help mobilize slow-to-move nutrients such as phosphoric acid
- Use of the Biodynamic compost preparations and horn manure (Preparation 500 – orchestrates and stimulates the living processes described above)

For more information on fertility materials that are strictly prohibited under the *Biodynamic Farm Standard* see Section I.B.6.

2. COMPOSTING GENERAL CONCERNS

Demeter approaches raw manure/urine as a restricted material. Excessive applications of raw manures can lead to groundwater contamination and an overload of a given soil's biology. Raw manure can also lead to pathological concerns. Raw manure collected in barns, holding pens, etc. should be composted using the Biodynamic compost preparations before they are applied to certified acreage.

In situations such as intensive grazing strategies where significant amounts of raw manure and urine are deposited on a land base, effort must be made to help the soil assimilate the manure in a living way before a crop to be certified can be planted or harvested. Some methods to aid such assimilation include light tillage, harrowing, applied compound preparations, applied compost teas, and all the related amplified soil biology techniques (i.e., earthworms, dung beetles, etc.). Soil temperatures must be warm enough to allow proper assimilation of manure by soil.

Making Biodynamic compost and using the Biodynamic compost preparations is a very deliberate process. Rudolf Steiner described this as a process of literally making the compost pile inwardly sensitive and receptive. In this sense it imparts a cosmic intelligence to the pile and ultimately to the soil the compost is applied to.

While the composting process upon initial observation seems to be a breaking down process, it is also a building and stabilizing process that moves raw compost ingredients towards a colloidal humus state. The heat cycle reduces pathogens and weed seed viability.

Biodynamic compost must not present a health risk due to pathogens that may be present in feedstock materials. The carbon-to-nitrogen ratio of the ingredients must be in the range of 25:1 - 40:1. Producers using an in-vessel or static aerated pile system must maintain the composting materials at a temperature above 131°F for 3 days. Producers using a windrow system must maintain the composting materials at a temperature above 131°F for 15 days, during which time the materials must be turned a minimum of five times. While there may be instances that arise where such a windrow system needs to be used (such as piles that become oversaturated with water, for example), as a general rule excessive turning of the compost pile should be avoided. A properly built compost pile should have the carbon-to-nitrogen ratio, porosity, and moisture content to allow the pile to decompose properly

without excessive turning. Temperatures reached by the Biodynamic compost should not exceed 150°F.

There are instances where quality composts that do not meet such times and temperatures might be made, such as a high-carbon compost or barrel compost. Note that if such composts are to be used in compliance with the NOP organic regulation, their use may need to recognize 90-120 day pre-harvest intervals or be shown to be in contact/ incorporated with soil for 90-120 days during the process of making the compost.

The Biodynamic compost preparations 502-507 must be utilized to make Biodynamic compost. They should be present to guide each stage of the manure's decomposition cycle to a humus state and at a minimum are utilized upon the initial building of the pile and with the first turning of the pile. It is also recommended that they be used each time the pile is turned thereafter.

Farm-generated fertility materials, such as livestock manures, are one of a farmer's most valuable fertilizers. Care must be taken not to lose the inherent fertility present in these materials during storage and the composting process. In some climates, a cover might be needed to prevent excessive moisture addition or excessive moisture loss. In such instances, the cover used needs to allow the compost pile to breathe and interact with its surrounding environment.

Ideally, Biodynamic compost piles are made in direct contact with the earth if it is possible to do this in compliance with local regulations (state, county, etc.).

Environmental concerns

The location, design, and function of manure/ingredient storage facilities need to comply with all federal, state, and local laws governing clean water, clean air, and health, safety, and welfare. Manure/ingredient storage facilities need to be located outside of floodplains and areas of shallow groundwater, as well as outside frequently moist or saturated soils. A manure/compost ingredient storage management plan should be developed and put in place, taking into consideration a 25-year 24-hour storm event.

Manure/ingredient storage facilities need to be designed to prevent any direct or indirect flow of manure/ contaminants into surrounding land, streams, rivers, or other surface waters in the event of sustained heavy rains and runoff, ruptures in storage tanks, leaching from in-ground pits, or breaching of storage lagoons. Clean water run-off from roofs, surface flows, and overflowing waterers need to be diverted away from manure piles. If manure and/or compost piles are less than 50 feet upland from a waterway, the piles need to be covered during rainy periods and/or a leachate containment system is in place. Active and finished compost piles must be stored up slope from manure/ingredient storage to prevent contamination.

Source materials

The effective carbon footprint that results from the movement of compost ingredients from their source to the composting site needs to be considered. Bulk manure and feedstock ideally come from the farming system itself or are imported from the general region where the compost is made. Ideally the composting of waste contributes to the overall well-being of a given local community and serves as a solution to local waste management concerns. If imported from the outside of a given farming system, bulk imported compost ingredients (such as bulk manures and feedstock) should not travel long distances to the composting site.

Bulk raw ingredients must not travel more than 250 miles to reach the composting site.

The use of organic wastes from municipal sources, industrial sources, or synthetic, chemically farmed

agriculture can be problematic. Such materials may be contaminated with environmentally persistent chemicals, heavy metals, and genetically modified plant material.

Municipal "green waste" used as feedstock must not contain compostable plastics and must be source separated prior to receipt on the farm.

Care should be taken with regard to the choice of sources used as compost ingredients. Attempt to use materials that have not been contaminated with prohibited materials such as prohibited pesticides, GMOs, heavy metals, wormers, and antibiotics. In the event this is not possible, product testing may be required to show that the finished product is not contaminated with materials suspected to be in the ingredient source.

Manure sources should come from certified organic livestock production at a minimum. If this is not possible and conventional livestock manure is used, the materials used in the conventional livestock production (e.g., wormers, hormones, GMO feed, antibiotics, persistent pesticides) must be documented.

Imported animal manures may not originate from animals kept in intensive animal husbandry systems or systems using no floor litter. In this section "intensive" includes any animals that do not have regular, reliable, and effective access to the outdoors (e.g., hens kept in barns) or subject to unethical practices (e.g., beak clipping of hens, tooth cutting of piglets).

Appropriate systems must be applied to prevent the contamination of certified land by residues of veterinary remedies, feed additives such as antibiotics, natural feed contaminants such as mercury in fish meal, and other residues such as herbicides in the litter.

Animal manures from animals fed genetically modified fodder must not be brought in. If proof that the manure is free from GMOs cannot be given, or GMO-free manure is not available, Demeter USA can give an exemption. Criteria for issuing an exemption must include: 1) the manure must be composted for at least a year, 2) it must be composted with Biodynamic preparations, and 3) the compost must be identified and processed as a separate pile.

3. APPLIED NITROGEN, PHOSPHORUS, AND POTASSIUM

The maximum amount of nitrogen and phosphorus that may be applied by way of fertilizers used, averaged over the crop rotation, may not exceed the amount that would be produced by those animals that the farm could support by its own irrigated (if necessary) forage production.

Application of this Biodynamic Federation Demeter International requirement is based on the concept of a "manure unit" (mu). Manure unit calculations as they relate to species/stocking rate and fertility inputs are summarized in Appendix F: "Calculation of Stocking Rate." A maximum of .56-mu/acre is allowed. This is the equivalent of 100 lbs. N/acre and 87 lbs. P/acre applied to the total acreage in the crop rotation.

Please see Appendix G: "Fertility Calculation Worksheet," for specific examples.

For cropping systems with high nutrient export in the form of harvested crops (see Table 1 for possibilities), and systems that are inherently nutrient-deficient from previous management or basic inherent geological and biological realities, a maximum of 150 lbs. N/acre and 125 lbs. P/acre can be applied to outdoor production. For nitrogen applications, the deficit must be substantiated by a nitrogen-balance illustrating significant export of N (minimum 100 lbs. N/acre) in the form of harvested/ exported crops.

Green manure plow down crops are not calculated as "applied fertility."

Calculation of N and P applications will be based on the analysis of the material applied. For example, a 5-5-3 fertilizer represents 5% total N and 5% available P. If 10,000 lbs. of this material is applied over a total acreage of 100 acres, then a total of 500 lbs. N and 500 lbs. P are to be divided by 100 acres. This represents 5 lbs./acre applied N and P, which is within the limits of the Standard.

Total application of other crop macro and micronutrients needs to be monitored and evaluated on a case-by-case basis. Nutrients should not be applied in any manner that results in a disproportionate nutrient balance or a toxic situation. In addition, the application of nutrients for plants should be targeted for maximum efficiency to avoid leaching and runoff in order to protect ground and surface water.

Approved phosphorus and potassium salt fertilizers can only be used when there are documented P and K deficiencies. Permitted forms of potassium salts cannot have a chloride content of more than 3%.

4. IMPORTED FERTILITY

As discussed in Section I.A: "Necessary Elements of the Farm Organism: Generating fertility," a foundation of a Biodynamic farm lies in its ability to generate its own fertility. Imported fertility needs to be monitored carefully and the need for it must be clearly documented (i.e., soil analysis, tissue analysis, visual deficiency in crop, etc.).

Allowance for imported fertility will be handled on a case-by-case basis. Imported fertility is only allowed if it can be clearly demonstrated that items listed in Section I.A: "Necessary Elements of the Farm Organism: Generating fertility," are being applied to their maximum efficiency given a farm's unique set of circumstances. If these factors are not at their full potential efficiency, there needs to be evidence that an evolution towards such efficiency is in progress.

As is the case for imported compost ingredients for on-farm composting, when finished compost is imported onto the farm the source must be located within a radius of 250 miles of the farm.

Imported nitrogen and phosphorus is permitted to be imported to a maximum of .5 mu/ hectare. This translates to 36 lbs. N/acre and 31 lbs. P/acre applied to total acreage in the crop rotation.

In orchards, imported fertility is limited to 86 lbs. N/acre and 75 lbs. P/acre. In grapes for wine, the total amount of fertilizer in 3 consecutive years shall not exceed 134 lbs. N/acre.

For cropping systems with high nutrient export in the form of harvested crops (such as horticulture market gardens—see Table 1 below), a maximum of 150 lbs. N/acre and 125 lbs. P/acre can be imported. For nitrogen applications the deficit must be substantiated by a nitrogen-balance illustrating significant export of N (minimum 100 lbs. N/acre) in the form of harvested/ exported crops. The amount of concentrated fertilizers* can be up to 72 lbs. N/acre/year and 36 lbs. P/acre/year, calculated as an average over the vegetable crop rotation and not the entire farm. This can only be considered if the items discussed in Section I.B, "Soil Fertility Management: General principles" and "Compost," are adequately met.

For perennial crops in tropical or subtropical climates, it is allowed to import up to a maximum of 150 lbs./acre nitrogen if nitrogen export is higher than 100 lbs./acre. The deficit must be substantiated by a nitrogen balance to be approved by Demeter. In this case, the amount of imported concentrated fertilizer can be up to 54 lbs. N/acre/year.

Greenhouses are allowed a higher level of nitrogen if they can prove by a nitrogen-balance during inspection that total input of pounds N equals total output of pounds N with a margin of 5%.

Exemptions to the maximum fertility application for small (case by case) and urban (within city limits) horticulture farms can be considered case by case if need can be proven.

Please see Appendix G: Fertility Calculation Worksheet, for specific examples.

Table 1: Maximum amount of manures and fertilizers in different crops

Farm Type	Max. Nitrogen	Specifics	Max. Amount of Concentrated Fertilizers*
Agriculture	100 lbs. N/acre/year		36 lbs. N/acre/year and 18 lbs. P/acre/year as an average over the farm
Horticulture	100 lbs. N/acre/year	Up to 150 lbs. N/acre/year if need can be proven	72 lbs. N/acre/year and 36 lbs. P/acre/year average over the crop rotation
Greenhouse	No limit	Nitrogen balance	72 N lbs./acre/year and 36 lbs. P/acre/year average over the crop rotation
Orcharding	86 lbs. N/acre/year	Up to 150 lbs. N/acre/year for tropical and subtropical perennial crops	36 lbs. N/acre/year and 18 lbs. P/acre/year as an average over the orchard area; up to 54 lbs N/acre/year for subtropical perennial crops based on N balance
Viticulture	134 lbs. N/acre/three years		36 lbs. N/acre/year and 18 lbs. P/acre/year as an average over the vineyards

**Concentrated Fertilizers — bone meal, meat and bone meal, dried blood, hair and feather and similar products. The amount of nitrogen from concentrated fertilizers must be less than the amount from farm manure, imported farm manure, and green manure.*

5. FERTILITY COOPERATIONS

Co-operation between Biodynamic farms (e.g., the exchange of fodder or animal manures) in the sense of a biological unit is possible. In cases where no Biodynamic farm is sufficiently close by, co-operation can be organized between the certified Biodynamic farm and an organic farm. In either case, there must be a formal agreement on file.

Before co-operation with an organic farm is permitted, the following conditions must be fulfilled:

a) The co-operating partner farm must feed the animals with 100% organic fodder.
b) The co-operating partner farm must be converted entirely to organic production.
c) An exemption must be requested and approved.
d) Farmyard manure must be prepared on the farm where it originates, or at least 6 weeks before application.
e) The distance of transportation must be kept at a minimum and will be considered as part of the exemption process.

f) Fodder cooperation with organic farms is only possible in cases of perennial fodder plant cultivation (at least three years). Application of preparations must start at least one year in advance and must be executed by the fodder absorbing Biodynamic farm. If crop rotation enables food crops on the cooperation area, application of preparations must be continued, if the fodder production is continued in the following years. Food crops produced in co-operation cannot be marketed as Biodynamic.

g) Fodder-production in cooperation under the previous conditions can be treated as on farm production and part of the Biodynamic amount for the purpose of Section IV. G: Feeding.

6. FERTILITY MATERIALS NEEDING SPECIAL CONSIDERATION

Imported fertility inputs

The Organic Materials Review Institute (OMRI) and Washington State Department of Agriculture Organic Program lists are used as a standard reference for brand name materials, and the National Organic Program (NOP) "National List of Allowed and Prohibited Substances" is the standard reference for generic name materials. Materials approved by OMRI and the NOP are not all allowed in the *Biodynamic Farm Standard*. Use of off-list products could result in de-certification. (See "Prohibited materials" section below and Appendix B: "Permitted and Restricted Fertilizers and Soil Conditioners.")

If meals from potential GMO crops are to be used as production aids, it must be verified that such materials are non-GMO at the time of application.

Ash may be used as fertility input only if obtained from acceptable sources such as untreated wood or coffee hulls. The source should be plant-based and free of prohibited substances. Caution is advised in application rates due to unknown mineral content.

The addition of some minerals, particularly trace minerals, can affect mineral balances in the soil. The importation of any minerals must be based on a documented need.

Prohibited materials

The use of plant wastes such as lawn clippings, leaves, green chop, or compost from municipal sources may be contaminated with lawn chemicals and/or petroleum products and consequently are prohibited for direct mulching unless it can be clearly demonstrated that they are free of prohibited materials. They may be used as fertility ingredients if they are composted as described above. If there is reason to believe that such materials may be contaminated with prohibited materials, Demeter reserves the right to have the materials tested.

The use of sewage sludge or biosolids is prohibited. This includes sludge ash.

Saltpeter, Chilean nitrate (nitrate of soda), soluble phosphates, chloride-containing potassium salts, and all forms of synthetic fertilizers as excluded by the NOP are prohibited (including nitrate and ammonium salts). Permitted forms of potassium salts must have a chloride content of more than 3%.

Off-farm manure sources should come from certified organic livestock production at a minimum. If this is not possible and conventional livestock manure is used, the materials used in the conventional livestock production (i.e., wormers, hormones, GMO feed, antibiotics) must be documented. No manure that is derived from "intensive" confinement operations (animals not having regular, reliable, and effective access to the outdoors) will be allowed.



C. Biodynamic Preparations

1. DESCRIPTION

A distinguishing feature of Biodynamic agriculture is the use of nine preparations made from herbs, mineral substances, and animal manures that are utilized in field sprays and compost inoculants applied in minute doses, much like homeopathic remedies are for humans. Originally described by Rudolf Steiner in a series of lectures on agriculture, these Biodynamic preparations are numbered 500-508.

Please see Appendix J for definitions of each of these Biodynamic preparations.

Biodynamic preparation use is required for Biodynamic certification.

2. SOURCES

Ideally Biodynamic preparations are made on the farm where they are to be used. The ingredients, such as the plant materials and the animal sheaths, are also produced ideally on the farm utilizing the core principles of the Biodynamic method in a comprehensive manner.

If you do not have experience making the preparations, it is recommended that you learn how to produce them prior to making them on your own. In the interim or if you choose not to make the preparations, they are available from approved companies that distribute the preparations nationally or through established regional preparation making groups. The Biodynamic community has many farmers who have extensive experience making and utilizing the preparations and are eager to share that knowledge. Please contact the Demeter office for a list of resources and companies approved to commercially distribute the Biodynamic preparations.

3. STIRRING

Hand stirring is preferred and should be done consciously. Flowforms and stirring machines may also be used, but the farmer should still maintain conscious contact with the stirring process.

4. APPLICATION

The compost preparations need to be applied to acreage to be harvested either via applications of Biodynamic compost or via an approved field spray or compound preparation. At a minimum, either Biodynamic compost or an approved field spray needs to be applied at least once every 3 years.

Preparations 500 and 501 need to be applied at least annually to all harvested crops. Preparation 500 should be applied in the later part of the day in the form of droplets that come in contact with the earth. Preparation 501 should be applied in the early morning hours as a fine mist that settles down onto crop foliage.

Application rates for the field sprays are ¾-4 ¼ ounces/acre for 500 and 1-2 gram/acre for 501. Typical application rate is ¼-½ tsp. of each compost preparation per 13 cubic yards of compost or deep litter manure/slurry. Typical application rate of a compound preparation like Barrel Compost is applied at ½ cup/acre.

5. STORAGE

Biodynamic preparations should be stored in a vessel that allows for the presence of oxygen. These vessels should be stored in a vessel made of natural material surrounded by peat or some other similar insulating material. The condition of the stored preps should be checked regularly. The preparation 501 should be stored in a vessel (such as a glass jar or horn) in a sunny location. Storage of all the preparations should be placed in a location free of electromagnetic fields (such as measured by a Gauss meter).

6. SAFETY

If preparations are made on the farm careful records are kept of the entire production process so that checks can be made of the following:

- The origin of the organ material (abattoir, type and origin of the animal, quantities)
- Site where preparations are being made (sketch of site)
- Date of insertion in the soil and of its extraction
- Record of disposal of any remains

Records will be checked as part of the regular Demeter inspection. Animal organs used need to be of appropriate quality.

D. Crop Protection

1. DISEASE AND INSECT CONTROL

The foundation of disease and insect control needs to be based on strategies that emphasize prevention located within the life of the farm. When applicable, the following techniques need to be demonstrably utilized to their maximum potential in order for a farm to import allowed pest control materials:

- Botanical species diversity
- Predator habitat
- Balanced crop nutrition
- Attention to light penetration and airflow

- Conscious use of the Biodynamic preparations
- Crop rotation
- Understanding of pest species life cycle / timing of planting

The use of synthetic chemicals to control pests; to prevent or control fungal, viral, or other diseases; or to control weeds, or the use of hormones to regulate or manipulate the growth of crops, is not allowed. Only those measures of control allowed within the *Biodynamic Farm Standard* and existing laws may be used. Appendix C lists materials approved for crop protection.

Note: *there are materials permitted in certified organic production that are not permitted with Demeter certified Biodynamic production. In addition, certain materials permitted as regulated materials by Demeter require specific exemption with criteria for use. See Appendix I for more information.*

Understanding the life cycle of a pest species is a very important tool in controlling a pest species. By knowing when a pest species is the most virulent, loss can be avoided by the timing of planting and by breaking the life cycle of the pest. Biocides that are not selective to the pest species should be avoided.

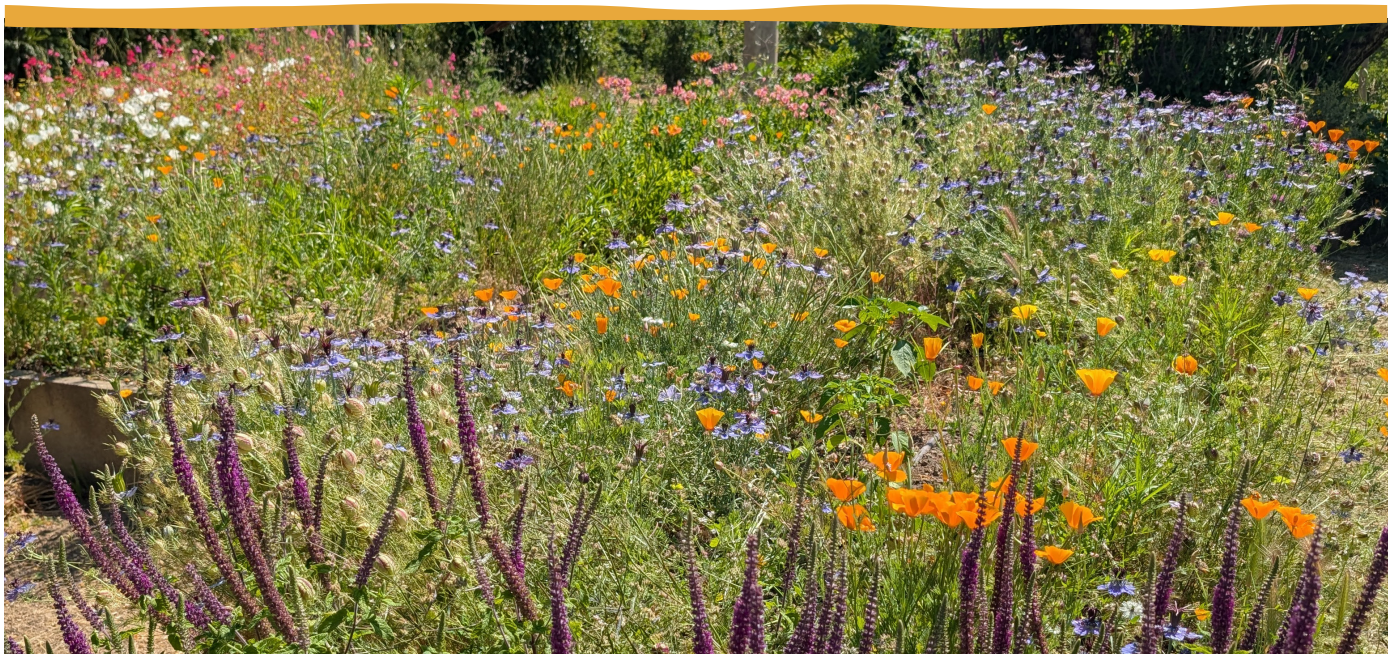
In organic production sulfur is widely used to prevent and control fungal diseases. It should be used only as needed, not according to a schedule. Alternatives exist which can be used separately or in combination with Biodynamic preparations to greatly reduce the amount of sulfur.

Copper products are limited to a maximum of 2.7 lbs. Cu/acre/year averaged over 7 years and, if possible, 1 lb./ application.

Note: *Pay close attention to the brands of pest control materials used concerning all ingredients and inert ingredients in their formulations. Brands used must not contain any materials prohibited for use by these Standards.*

2. WEED CONTROL

The foundation of weed control needs to be based on strategies that emphasize prevention located within the life of the farm. When applicable, the following techniques need to be demonstrably utilized to their maximum



potential in order for allowed weed control materials (including petroleum-to-run tractors) to be imported:

- Understanding of weed species life cycle / timing of planting
- Adjusting fertility conditions that promote certain weed species
- Shade/crop canopy
- Mulching
- Crop rotation
- Identifying and avoiding the spread of invasive weed species
- Grazing
- Irrigation

Understanding the life cycle of a weed species is a very important tool in controlling a weed species. By knowing when a weed species is the most virulent, loss can be avoided by the timing of planting and by breaking the life cycle of the weed.

If mulching is used, it is preferable that the materials be produced on the farm. If this is not possible, mulching materials from off the farm must be chosen with care. Imported synthetic mulch materials that restrict oxygen to the soil below need to be used with caution. If synthetic mulch materials are used, they must be pulled up annually and not allowed to break down into the soil. In this case, it is preferable that the materials are durable enough to be reused annually. The materials must not inhibit the biological dynamics of the soil below.

E. Protection from Environmental Hazards

1. BUFFER ZONES

Buffer zones must be created and maintained between certified fields and chemically treated acres. Hedgerows are recommended for protection and to enclose the farm organism. It is not possible to quantify here how much of a buffer zone is required, as the need for space will vary depending on the neighboring activity, whether there is a risk for prohibited material contamination, and, if so, what the prohibited materials are. Each situation will be approached on a case-by-case basis. Any necessary buffer areas should either not be planted to a harvested commodity or such commodities will need to be harvested separately, segregated, and sold as non-certified products.

2. HIGH-VOLTAGE POWER LINES

Because Biodynamic agriculture works with the dynamics of subtle forces, the impact on crops grown under high-voltage power lines that emit significant EMF levels are a concern. Often these power lines cross production areas in a random manner, so it is generally not practical to segregate that portion of the harvest. To address these negative impacts, the areas should receive extra applications of the full complement of the Biodynamic preparations.

3. SPRAY DRIFT AND RUNOFF

Products grown on areas contaminated by spray drift or runoff from a neighboring chemically managed field may not be sold as certified. Residue tests may be needed to establish the area of contamination. These areas, if harvested at all, must be kept strictly segregated, and documentation must be provided verifying the sale of the

crop as non-Demeter certified.

4. IRRIGATION WATER

Irrigation water should be free of chemical and biological contamination and may require periodic testing if there are obvious potential sources of measurable contamination. If the source is chlorinated municipal water, it is recommended that the water be aerated either by creating a basin or pool or using flowforms or overhead sprinklers.

5. LIVESTOCK

Livestock should not have access to natural bodies of water that are year-round and permanent.

Livestock should not be grazed in sensitive ecosystems unless it benefits those systems—for example, in the removal of noxious weeds. These situations will be approached on a case-by-case basis.

Domestic grazing animals must be handled in a way that will not pose a contamination threat to food for human consumption. Through the entire growth period of the harvested products, it must be demonstrated that it was free from contamination of domestic raw animal manures.

F. Duty to Report

In case of severe attack by pests or disease in fields or during storage, which cannot be controlled by approved measures and where prohibited measures are unavoidable, a report must be made to a Demeter representative before any prohibited measures are taken.

Use of prohibited measures may lead to a loss of certification of the whole farm for a period of up to 3 years. This situation compromises the whole farm concept by creating a parallel production issue. Demeter guidelines do not allow parallel production or partial farm certification. Therefore, this situation is viewed very seriously. It is the owner's responsibility to educate field workers regarding acceptable practices and those that would compromise certification.

G. Seeds, Vegetative Propagation Stock, Seedlings, and Perennial Planting Stock

It is strongly encouraged that seeds, vegetative propagation stock, and transplants come from Biodynamic sources. In addition, it is strongly encouraged that as much seed and propagation material as possible is produced on the farm under Biodynamic management and that genetics are developed that are best adapted to its climate and microclimates. Use of plant species also adapted to the local climate helps to address other concerns of this Standard, such as emphasis on farm-generated pest control and water conservation.

If imported seed is necessary, preference should be given to open-pollinated seed varieties. Hybrid varieties that are the result of protoplasm and cytoplasm fusion techniques are prohibited. Cereal hybrids, except for corn (*Zea mays*), are excluded for the production of feed and food.



For seed and vegetative propagation stock that is imported, there must first be a search for Biodynamic seed and vegetative propagation stock. If Biodynamic seed and vegetative propagation stock are not available in the quantity or quality needed, then there also needs to be a search for certified organic seed and vegetative propagation stock with the same parameters. In the event Biodynamic or organic seed and vegetative propagation stock are not available in varieties that fit your farming system, an exception to use nonorganic seed and vegetative propagation stock can occur given a documented search for Biodynamic/organic sources has occurred and the seed and vegetative propagation stock are shown to be non-GMO and not treated with prohibited materials.

The use of genetically engineered seed, transplants, or rootstock are prohibited.

The use of seed, propagation, and plant material produced by new plant breeding techniques (NPBTs) is prohibited in production on a Demeter certified enterprise. This comprises all NPBTs considered by IFOAM as techniques of genetic modification leading to GMOs according to the existing EU legal definition. These are:

- Oligonucleotide directed mutagenesis (ODM)
- Zinc finger nuclease technology types I to III (ZFN-I, ZFN-II, ZFN-III)
- CRISPR/Cas
- Meganucleases
- Cisgenesis
- Grafting on a transgene rootstock
- Agro-infiltration
- RNA-dependent DNA methylation (RdDM)
- Reverse breeding
- Synthetic genomics

The use of plant seeds treated with low-energy electrons is prohibited if alternative treatment according to this Standard is available.

Transplants of perennial tree and vine crops, if grown from non-certified Biodynamic stock, must be grown

according to this Standard for 12 months prior to the appearance of flower buds of the crop to be sold as certified. If propagation material can be documented as being unavailable in Biodynamic or organic quality, conventional propagation material may be imported. Post-harvest treatment with materials prohibited in certified organic production is not permitted.

H. GMO and Nanotechnology — Avoidance and Protection

The Demeter USA Standard for farm products labeled/sold as BIODYNAMIC is "none detected" when tested for suspected GMO contaminants.

Demeter will not permit use of transgenic, spliced, or engineered plant or animal products or any derivative in food, feed, or fiber production. It will be necessary to verify that farm inputs, non-certified seed, and inoculants used are non-GMO.

In regions where the possibility of genetic drift from neighboring GMO crop varieties is high, close attention needs to be paid to timing of planting, flowering, etc., to avoid the potential for drift as much as possible.

If a crop has the high likelihood of being contaminated by drift (for example, corn, soybean, canola, alfalfa, beets, etc., being grown in a region where GMO production is prevalent), Demeter may require testing prior to sale of these crops labeled as Demeter Certified Biodynamic®.

There is evidence that the post-harvest handling of susceptible crops is a primary means of contamination of previously clean crop due to the prevalence of GMO crops that are handled in many cleaning and storage facilities. If possible, use only harvest, storage, and post-handling equipment that is dedicated to Biodynamic production.

Because the impact on the environment and on human and animal health is unclear, Demeter adopts the precautionary principle concerning human-made nanoparticles. Demeter does not permit their usage in Biodynamic agriculture, or in any Demeter certified products. Particles less than 100 nanometers in size shall be excluded from farm inputs, ingredients, aids, and additives as far as practicable. However, this requirement cannot guarantee freedom from human-made nanoparticles due to the pervasiveness of these materials, the lack of a legal obligation to label them, and the difficulty of analytical determination.

I. Residue Testing

This section refers to residues like herbicides and pesticides or farm inputs in general which are not in line with the basic requirements of organic and Biodynamic farming. General environmental contaminants, which can endanger the marketability of products irrespective of their organic status, are not included in the following.

In some cases, Demeter may require residue testing of soil and/or crop samples (specifically for prohibited materials including GMO contamination) as part of the certification process. Demeter must approve who collects the sample, the number and type of samples, and select the testing lab used.

GMO tolerance levels permitted for Demeter certified farm production must be shown to be "not detected" via laboratory analysis from an approved lab.

Maximum pesticide tolerance levels permitted for Demeter certified production are as noted in the USDA

National Organic Program.

If a product or raw ingredient loses its organic status due to exceeding the permitted maximum levels of the USDA National Organic Program or proven targeted use of non-approved substances, it automatically loses its Demeter certification.

The following additional factors apply:

- Analysis results with a value higher than 0.01 mg/kg, based on the unprocessed starting product and considering the measurement uncertainty and the dispersion range usual for the prohibited substance, trigger a search for possible causes.
- If investigations by Demeter USA show that the material was undoubtedly not used intentionally but because of unavoidable measures such as contaminated sites, drift, or storage contamination, Demeter USA may release the product concerned even if the orientation value is exceeded.
- The above does not apply if more than 2 substances per product or raw material exceed 0.01 mg/kg (each).
- The licensee concerned must report any materials exceeding 0.01 mg/kg to Demeter USA. If s/he knowingly fails to do so, and the residue findings are discovered at a later stage, it is not possible to refer to the treatment as an orientation value and there is cause for the product or raw material to lose its Biodynamic certification.
- If investigation reveals the source of residues, then a plan must be developed to mitigate future contamination.

SECTION II

Greenhouse Management



A. General Principle

A greenhouse can be an important element within a Biodynamic farm, but it must be seen as part of the greater farm organism or be managed as a whole independent system(s) in and of itself. A greenhouse may be used to grow plant starts in containers or for growing crops directly in the soil. In all situations the requirements of the *Biodynamic Farm Standard* apply in full. For example, the requirements concerning imported/applied fertility, pest control, biodiversity, crop rotation, weed control, water conservation, etc., are all applicable to any greenhouse management under Demeter certification.

Management of rainwater shed from the area under cover is mandatory so that it does not erode soil or create a point of pollution.

Mulching materials:

- Organic mulching material is permitted (for criteria for imported mulches, see Section I.B.6: "Fertility materials needing special consideration")
- Biodegradable and oxo-biodegradable plastics are not permitted
- Plastic mulching material is only permitted if it is reusable for at least 5 years

This Standard distinguishes between greenhouses as part of a horticultural enterprise and specialized protected cultivation. The distinction is based on the level of fertilization.

GREENHOUSE WITHIN A HORTICULTURAL ENTERPRISE

For greenhouses as a part of a farm, the respective maximum limits of the respective farm type apply. In this case, the upper limit does not have to be observed for the greenhouse, but for the entire operation.

Enrichment with CO2 inside greenhouses on a horticultural enterprise is not permitted. Heating of greenhouses

based on fossil fuel sources is not permitted after 2028.* The source of energy can come from fossil fuel sources for frost protection for in-ground crops (up to 41°F/5°C), raising plant starts including holding planting stock, and curing harvested crops.

Energy-efficient lighting is permitted for seedlings, herbs, mother plants, and ornamentals.

SPECIALIZED PROTECTED CULTIVATION

Specialized protected cultivation has no upper limits with regards to nitrogen input, but must comply with several other requirements in order to compensate for the lack of integration into the overall farm organism. Specialized protected cultivation is allowed a higher level of nitrogen if they can prove by a nitrogen-balance during inspection that total input of lbs. N equals total output of lbs. N with a margin of 5%.

Specialized protected cultivation under plastic or glass must meet the following requirements:

- Systematic year-round enrichment with CO2 is not permitted. Targeted enrichment to optimize the CO2 levels during deficit growing periods (e.g., autumn) is permitted.
- Energy-saving techniques, such as the use of special heating systems (e.g., ground or vegetation heating) must be introduced to the enterprise wherever possible.
- In greenhouses, steam sterilization/heat treatment of the earth is not permitted.
- Biosolarization is permitted by exemption from Demeter USA as a mixture of solarization (heat development by covering moistened soil under a transparent film) and biofumigation (adding fresh organic matter to the soil) with the aim of reducing nematode pressure and on-site composting of crop residues. Approval of the exemption is based on satisfaction of the following conditions:
    - Immediate application of 500 and Biodynamic compost preparations after using this method
    - Only in combination with a crop rotation concept
    - May be applied for again at the earliest interval of three years

Specialized protected cultivation, must also meet the following requirements*:

- Biodiversity reserve on the farm area must reach at least 20% of the whole farm area.
- Biodiversity must be integrated into the greenhouses with flower strips and green manure.
- If using compost, buildup of damaging nutrient levels must be avoided.

**For this requirement Demeter can grant existing licensees a transitional period until the certification cycle 2028. For operations in conversion, this regulation will already apply from 2022 onward.*

B. Potting Soils and Growing Media

Definitions:

- Potting soil – The mixture used to start seedlings
- Growing medium – The mixture in which microgreens are grown to maturity

Potting soil (a mixture used to start seedlings) should, if possible, originate from the farm's own compost, which has been made with Biodynamic compost preparations. Biodynamic compost must comprise at least 25% of the

mix.

The use of commercial potting mixes requires the approval of Demeter and these mixes must have the compost preparations 502-507 applied to the potting mix prior to germination of the seeds. Options for introducing the preparations to the potting mix include, but are not limited to: 1) inserting the compost preparations to the potting mix at the time of delivery (at least a month prior to use), 2) a tea made from prepared compost applied as a spray or drench, stirred Barrel Compost, or stirred Prepared-500 to the potting soil before seed germination.

Potting mixes with less than 25% Biodynamic compost may be used for certain plants (like cactus, succulents, Mediterranean herbs, etc.) due to horticultural propagation requirements, but must be approved by Demeter USA.

Chicory roots should be forced in soil. If water techniques are used, the water must have no additives, which are prohibited in these standards. Water-forced chicory must be declared as such.

Rock wool is not permitted.

Potting soils and growing media may be sterilized with steam. To guide microbial recolonization, the Biodynamic compost preparations, compost tea, Preparation 500, or a compound preparation such as Barrel Compost or Pfeiffer Compost Starter must be used following sterilization.

C. Hydroponics and Container Growing

Hydroponic growing, crops grown on inert substrates (e.g., scoria), and container crops are not allowed. Soil-less and thin soil layer growing is not permitted except for those cultures of sprouts, shoots, microgreens, and aquatic plants, such as cress and certain ornamentals. In the latter case, Biodynamic preparations may be added to the water.

D. Certified Sprouts and Microgreens

For sprouts and microgreens to be Demeter certified, the seed must be from a certified Biodynamic source. The growing medium for microgreens ideally originates from the farm. Commercial growing mediums must be approved for use by Demeter and be inoculated with Biodynamic Preparations 500 and 502-507. Greening of sprouts and microgreens must occur by sunlight.

The growth must take place in or on food-grade surfaces that have no potential for contamination with prohibited materials.

The room or area in which the sprouts are grown must not pose any contamination threat to the integrity of the product.

Water used must meet processing requirements for chlorine (4ppm) and fluoride (4ppm) and be tested at regular intervals for *E. coli* and other disease organisms. Consult your local health department for further requirements in your locality.

Demeter processing guidelines apply.

SECTION III

Structural Components



A. Treated Lumber

A producer must not use lumber treated with arsenate or other prohibited materials—for new installations or replacement purposes—that comes in direct contact with soil used in certified production or certified livestock. Harvested portions of crops may not touch treated lumber of existing installations.

SECTION IV

Livestock Guidelines



A. Conversions and Certification — Conditions Allowing Product to Be Marketed as Demeter Certified

Milk / fiber	Must be managed to Demeter Standard for 12 months.
Meat	Managed to Demeter Standard from the last 1/3 of gestation. Imported meat animals cannot be certified if not already Demeter certified Biodynamic or certified organic at a minimum. If certified organic when brought in, then must be managed to the Demeter Standard for a minimum of 1 year for cattle or ½ of life for hogs, goats, rabbits, and lambs. The ideal is for animals to spend their entire life on the farm.
Meat poultry and fow	Day-old chicks managed to Standard until slaughter. On-farm hatching preferred.
Eggs poultry and fowl	Day-old chicks. Certified organic pullets not over 18 weeks old.

B. Stocking Rates

[See Appendix F: "Calculation of Stocking Rates"]

The stocking rate considers the maintenance and development of soil fertility.

The maximum stocking rate may not exceed .8 Livestock Units/ acre (.56 manure units/acre) if feed is brought in.

Note: *This stocking rate might not be possible where climatic conditions do not permit it. In this situation, reducing the maximum allowed stocking rate may be necessary to maintain the health of the farm.*

C. Breeding Stock: Beef and Dairy

Imported mature (service or productive age) breeding stock, including bulls, rams, etc., from outside sources to the farm, is allowed up to a maximum of 10% of the herd per year. In a milking herd, the introduced cows must be from a certified Biodynamic or organic herd.

Non-certified animals cannot be introduced to the milking herd until they have undergone 12 months of management according to this Standard. Certified cows and heifers, or those which have been fed according to organic rules for 12 months, may be introduced into the Biodynamic herd while staying within the 10% per year brought-in stock limitation.

An exemption allowing up to 40% imported animals is permitted in the following situations:

- Rare/endangered breeds
- When a breed is changed
- When a new livestock specialization is developed
- When there is a documented need for an increase in herd size

These imported animals must comply with the 12-month certified Biodynamic feed requirement before their milk can be certified. Meat cannot be certified unless the animal was born on a Biodynamic or organic farm and under this type of management from the last 1/3 of gestation (see above table).

Mature breeding stock from conventional sources cannot be sold as certified Biodynamic.

D. Slaughter Stock

Except as specified otherwise, the animals must be born and raised on a Demeter certified Biodynamic farm as part of an indigenous herd. Feeder stock from certified organic sources can qualify as Demeter Biodynamic when fed according to the *Biodynamic Farm Standard* for 12 months for cattle and ½ the life of hogs, goats, rabbits, and lambs. Poultry must be raised from day-old chicks or raised on farm. Only piglets from management systems using floor litter and with undocked tails may be brought in. Feeder stock from conventional sources cannot be sold as certified Biodynamic.

E. Reproduction

Natural insemination is strongly recommended. It is recommended that the farm keep its own bulls, rams, etc.

Genetically engineered animals are not permitted. Embryo transfer is not permitted.



F. Record Keeping and Animal I.D.

When practical all animals must be tagged or identified individually in some manner. It is recommended to have a herd book with a page for every reproductive age female. Records must be kept as follows:

- Date and age acquired
- Source of animal
- Source and amount of brought-in feed with certificates
- Health care measures taken
- Date of sale
- For dairy herds, records must be kept of somatic cell count and plate count. A DHIA record is suitable if available.

G. Feeding

Complete self-sufficiency is to be aimed for as a matter of principle. For Demeter Biodynamic certification, a minimum of 60% of the feed ration (on a dry matter basis) must come from on-farm production for ruminants, *Equidae* and *Camelidae*. If the remaining 40% of the feed ration is imported, a minimum of 10% must be Demeter certified feed, or In Conversion to Biodynamic as described below, and the remaining 30% must be certified organic at a minimum.

When production meets the requirements of the NOP Organic regulations, fodder produced on land In Conversion to Biodynamic can comprise up to 20% of the annual fodder requirement for roughage-consuming animals and 10% for other animals.

The minimum percentage of on-farm feed for pigs and poultry is 50%. The percentage of Biodynamic feed may be reduced to 50% for pigs and poultry with the approval of Demeter.

Demeter Certified In Conversion to Biodynamic feed and organic feed together may not exceed 50% DM of the annual feed ration.

Table 2: On-farm production and average annual ration for all animals in dry matter

Animal species	Min. Demeter share in the annual ratio*	Max. organic share in the annual ratio	Min. on farm production**	Approval possible for less Biodynamic share in the case of need?
Ruminants, *Equidae* and *Camelidae*	70%	30%	60%	No***
Pigs	70%	30%	50%	Yes, down to 50%
Poultry	70%	30%	50%	Yes, down to 50%

** May contain "In Conversion to Biodynamic" feed when the feed meets organic requirements. If it is brought in, it can only be 20%, so that still 50% is fully converted Demeter fodder.*
*** Can be an average calculated for all animals of the farm.*
**** Except for emergency cases with approval of Demeter.*

With regard to grazing of land that is In Conversion to Biodynamic by Demeter certified livestock (i.e., when a Biodynamic farm brings additional land into conversion):

- Grazing of In Conversion to Biodynamic land by Demeter livestock is limited by the requirement that the land must meet the NOP Organic Standard at a minimum.
- Grazing of land that is In Conversion to Biodynamic should be restricted to young stock, dry cows, and dry ewes wherever possible. Milking livestock, livestock within three months of finishing, and laying hens should be grazed on fully Demeter certified land wherever possible.
- Feeds from on-farm production which is in the first year of conversion to Demeter and organic can only be fed on one's own farm. In the first year of conversion this feed can be fed up to 100% of the ratio. In the following years or if a farm buys new land, up to 20% of this feed can be fed in the ration.
- Feeds from on farm production which is in the second year of conversion to Demeter and already organic can be fed on the own farm without limit. It can be brought in up to 50%, so that at least 50% is fully certified Demeter fodder. See also Table 2.
- In all cases, the corresponding effects on the certification status of the end products must be taken into account.

Mineral supplementation is not included in the 50% brought-in limitation. No livestock, ruminant or non-ruminant, may be fed any meat products, including bone meal, or manure. Feeding milk, milk products, whey, and eggs are permitted. The natural behavior of some species, such as poultry and swine, to forage in bedding or compost is acceptable.

Ruminants must derive the roughage portion of feed from pasture during the grazing season. "Pasture" is defined as growing plant material that the animal utilizes for nutrition and medicine. If a livestock operation exists in a region where pasture production is not possible due to climatic conditions, it may not be possible to achieve

Demeter certification. [See Section IV. B: "Livestock Guidelines — Stocking Rates."]

Calves should be raised on the milk of the herd rather than on a milk replacer.

FEED SUPPLEMENTATION

Fodder for ruminants must comprise of at least 75% roughage on a dry matter basis throughout the year. Supplementation with synthetic amino acids is not allowed. Good pasture, Biodynamic or organic feed, and outdoor access are the best approach and preclude the need for supplements.

Vitamins approved by FDA may be allowed, but only in the forms permitted by the national organic regulation. Ideally, vitamin supplementation would be temporary while an attempt is made to obtain better feedstuffs or improve environmental conditions. Consider as alternatives to synthetic vitamins probiotics, sprouted grains, dried herbs, chopped root crops, chicory, and other herbs seeded in pastures and hay fields.

Silage may not be treated with synthetic preservatives, but may be treated with organic molasses or whey.

Antibiotics are not permitted in feed to any class of livestock. This includes the feeding of calves with milk from treated cows.

H. Emergency Feed Protocol

An emergency exists when weather or other circumstances beyond the grower's control affect the outcome of the crop. In such instances it may be possible to utilize certified organic feed beyond the current 20% of the ration allowed. Demeter must be informed before any action is taken. A decision will be made on a case-by-case basis.

Criteria used will be:

- Least amount of certified organic feed purchased as possible
- Fed for the shortest time possible
- To the livestock least likely to be compromised as to Biodynamic integrity

Failure to secure approval before feeding emergency feed may result in decertification.

I. Housing and Outside Access

The behavioral and species-specific characteristics of farm animals are given respectful consideration when determining their housing and general living conditions. Creating an environment that does not unnecessarily restrict their movements and innate behavior, including housing that allows the animals to move freely, is necessary.

Totally slatted floors are not permitted. Floors must be stable and permit mobility.

Livestock must have protection from excessive heat, dust, harmful gasses (such as ammonia), and excess humidity.

Access to free-range forage and the outdoors is required for all livestock, taking into consideration weather and health.

CATTLE, SHEEP, GOATS, AND HORSES

These animals should have outside access all year round taking into account inclement weather, soil protection, and animal health. The animals must have access to pasture during the grazing months, and during these months the majority of their feed must be fresh green material such as grazing pastures. Every animal needs a dry, soft, and insulated spot where it can lie down, rest, and stand up with adequate room to move without causing injury to it or to other animals. Calves are to be given contact with each other as soon as possible. They are to be reared in groups from the second week on if there are sufficient numbers of animals of the same age. Boxes for calves are permitted only through the first week.

PIGS

The pigs' rest area should include bedding. Sows should be confined for the shortest period of time necessary for farrowing. Open sows, pregnant sows, and gilts should be kept in groups, with access to the outdoors.

MANURE HANDLING

Demeter certification requires that barnyard manure be carefully collected, preserved, and composted. Collection storage and containment of manure/urine must be done in a manner that does not lead to serious contamination of surface and groundwater.

- Livestock confinement and manure storage facilities are designed to prevent any direct or indirect flow of manure into waterways or other surface waters.
- Storage facilities are not located in floodplains or areas with shallow groundwater tables and/or frequently moist or saturated soils.
- Clean water run-off from roofs, surface flows, and overflowing waterers are diverted away from manure piles.
- There is a manure storage management plan in place, taking into consideration a 25-year 24-hour storm event. Sufficient manure storage needs to be in place for 120 to 180 days of manure buildup, unless the operation has access to other environmentally acceptable methods to recycle manure nutrients (such as composting and/or biogas production).
- If manure and/or compost piles are less than 50' upland from a waterway, the piles need to be covered during rainy periods and/or a leachate containment system is in place.

J. Management of Poultry

1. For poultry production 50% of the feed ration must be on-farm Demeter certified feed. An exemption to allow the balance (50%) of the feed to come from certified organic production may be granted based on a documented search documenting Demeter certified feed is not available.

Concerning the stocking rate in relation to acreage of forage provided Appendix F: "Calculation of Stocking Rate" applies.

A part of the diet must be given so that the animals can forage for food. Fowl-like birds must have 20% of their fodder as whole grains in the litter or in the open-air run. At least 5% must be in the litter.

All poultry must get some grit. The animals must be able to drink from open water sources. Geese and turkey need green pasture during the vegetation phase.

Demeter pasture geese need at least 35% of the feed dry matter as fresh pasture. Ducks must be able to dabble to take up roughage feed.

Note: *If operating a Demeter certified poultry operation, take precaution with certified organic feed, as DL Methionine is allowed under the NOP and not under the Biodynamic Farm Standard.*

All poultry species require management that allows their natural behavior. For the improvement of the social structure in poultry flocks, two roosters should be kept for every 100 layer hens.

Sufficient feeding troughs and water bowls must be provided.

For poultry that normally perches, elevated resting places appropriate to the species must be provided. Sufficient sand-bath areas and areas for sun bathing must be supplied, and water poultry must have an adequate water supply. Ducks need to have water areas for swimming; geese need a supply for plunging their heads and necks.

Stables, buildings, and housing must be constructed and maintained in a way that meets the natural requirements of the birds. Sufficient daylight, good climatic conditions in the housing, as well as low dust exposure are indispensable preconditions for the health and welfare of poultry. Any mutilations of poultry such as beak cutting, trimming, or castration are excluded. The keeping of capons is excluded as well.

2. In their active phase during the day, a maximum of 4.4 layer hens, parent stock, or 7.1 young layer hens or a maximum of 16 kg of live weight (max. 18 kg live weight in mobile coops) per m2 can be housed.

3. Daylight can be extended by illumination to a maximum of 16 hours a day. In the scratching area and in the area for feeding and water supply, there must be sufficient daylight. For illumination only, lamps without a stroboscopic effect are permitted.

The aforementioned requirements are obligatory for all operations regardless of the number of poultry kept. The following requirements are not obligatory on farms with a total number less than 100 layer hens, 100 chickens for fattening, 20 turkeys, geese, or ducks.

4. The housing may contain a maximum of 3,000 layer hens (preferably held in flocks of 1,000 hens or less) or parent animals for layer hens or fattening animals, 9,600 young layer hens and their brothers or young parent animals (separated into flocks of no greater than 4,800 birds each), 10 flocks of 200 layer quails, max. 1,000 turkeys, 2,500 cockerels or guinea fowl, 1,000 geese, 1,000 ducks, and 10 flocks of 500 quail for fattening. Exemptions may be approved by Demeter for existing buildings. All new facilities must comply with this standard.

5. Depending on the local climate of the country, it makes sense to offer stables with different climate areas (warm inner area and an outer area called winter garden), with an adjacent poultry run. The adjacent poultry run can be fenced in but not roofed, with pop-holes to the pasture, and covered with scratchable, humidity-absorbing material. It is important to protect the pasture close to the housing from excess manure.

6. In housing with very cold climate areas it is possible to keep layer hens during the night in the warm climate area at a higher stocking rate.

In the immediate poultry yard (winter garden) the maximum stocking rate per square meter is: 10 layer hens or parent animals or 16 young hens or 48 kg live weight of poultry for fattening.

In the inner part of the housing (warm climate area), when the pop-holes to the outer part of the structure are open, a maximum of 8 layer hens or 13 young layer hens or 24 kg live weight of poultry for fattening per square meter can be kept. In this case the pop-holes must be self-opening (automated). Only under these preconditions is the winter garden estimated as stable area.

7. Stocking rate, number and width of pop-holes, equipment for feeding and water supply, higher perches, and nests with litter or with a smooth inlay must be adjusted to the weight of the animals.

During the active phase the animals must not be hindered in their access to the different housing zones.

The width of the pop-holes between the different zones/areas must be a minimum of 1 m per 150 layer hens, 250 young layer hens, and 500 kg live weight of poultry for fattening. The height of the pop- holes is to be adjusted so that animals can walk through upright. Raised slatted floors must have pits for the manure. There must not be more than three slatted floors one upon the other. At least one third of the accessible housing area must be covered with litter.

The pasture area shall meet the natural requirements of the respective poultry species and must be adequately covered to provide protection (for example, with bushes, trees, or artificial protection).

The minimal area required is: 4 m^2 for layer hens and breeding animals; 1 m^2 per kg live weight of poultry for fattening, but at least 4 m^2 per animal; 10 m^2 per turkey; and 5 m^2 per duck. Geese need a minimum of 4 m^2 pasture area per kg live weight, and a minimum of 15 m^2 per goose, and there is no limitation of fence distance to the stable.

Pasture must not be further from the housing than 150 m for layer hens, animals for fattening and turkeys, and 80 m for ducks. For geese the distances are unrestricted.

Minimum age at slaughter for poultry

Species	Minimum age (days)
Chickens	81
Peking ducks	49
Female Muscovy ducks	70
Male Muscovy ducks	84
Mallard ducks	92
Guinea fowl	94
Turkeys and roasting geese	140

8. To minimize the risk of an infection with pathogens like *Salmonella*, *Campylobacter*, etc., during the rearing of young layer hens, a large open-air run can be an alternative to pasture access.

9. The breeding and hatching has to be included in the inspection process.

K. Veterinary Treatment of Animals

Herbal, homeopathic, or anthroposophical treatments are to be given preference. Routine and preventative treatment with allopathic medication is not allowed except in the case of vaccinations required by law. Legal withholding times are to be doubled in case of required vaccinations. It is strongly recommended to use homeopathic nosodes in place of vaccines whenever applicable.

ANTIBIOTICS ARE PROHIBITED

Any animal treated with antibiotics must be permanently identified and removed from the certified herd. Meat and milk cannot be sold as certified, though the animal may be used as breeder stock to produce certifiable progeny if antibiotics were not administered during the last third of pregnancy or during lactation. Prevention is the best approach to health problems, with stress reduction playing a major role. Probiotics are acceptable if documented to be a material in compliance with national organic regulations, GMO-free, and not produced on GMO substrate.

HORMONAL TREATMENT

The use of hormonal treatments to control estrus, increase production, or for any other reason is not permitted except that oxytocin can be used in post-parturition therapeutic applications such as retained placenta. Exact records must be kept of all treatments and made available to the Demeter.

USE OF PROHIBITED INTERNAL PARASITICIDES

The use of prohibited internal parasiticides is not permitted in slaughter animals, but NOP permitted parasiticides are permitted in dairy and breeder animal emergencies. Parasitical treatment must be done in compliance with the National Organic Program at a minimum. Emergencies are to be minimized using preventative alternatives such as quarantine and fecal exams for all incoming stock, adequate pasture rotation and good pasture management, maintenance of clean facilities, periodic fecal exams, the culling of seriously infested animals, vector and intermediate host control, biological control methods, and maintenance of dust wallows for poultry.

EXTERNAL PARASITES

Primary control of external parasites needs to be based on modifying the livestock living situation in a manner that inhibits the parasites' presence and reproduction (i.e., sanitation, repelling agents, release of predators, etc.). In extreme cases natural pyrethrum may be used in a dilute form in barns and loading areas. It may not be used directly on livestock. Concentrated natural pyrethrum may not be used.

Note: *With the exception of whole flower natural pyrethrum, only extracted pyrethrum products with approved ingredients may be used.*

MUTILATION

Dehorning of animals and dehorned animals are not permitted to produce Demeter certified livestock products. In well-justified cases, an exemption may be approved but must be reviewed annually.

Species of ruminants polled by prohibited forms of genetic engineering cannot be used to produce Biodynamic milk, meat, and fiber. Historic, land race, and heritage breeds of naturally polled ruminants and genetically hornless breeds, which no longer exist in horned form (compare to the following positive list), are permitted for the production of meat only. Those breeds may be used for the displacement crossing.

- Aberdeen Angus
- Galloway

(This list is not exhaustive; further breeds can be requested for addition by Demeter.)

Genetically hornless breeds in any form and displacement crossing either with genetically hornless breeds, or with any other form of hornless bred breeds or crossbreeds, in the production of Demeter milk is prohibited.

If an enterprise willing to convert has genetically hornless breeds, the enterprise must begin immediately after the start of the conversion period with displacement crossing of the hornless genetics. During the process of transition, hornless cattle are tolerated on the enterprise, if progress towards horned cattle can be shown during inspection. Within meat cattle, the historic, land race, and heritage polled breeds mentioned above can be used for displacement crossing.

Tail docking of lambs is not to be carried out systematically. An exemption to dock tails is possible if the intention is to improve health, welfare, or hygiene of the sheep. Qualified personnel must carry tail docking out at the most appropriate age and any suffering of the animals must be reduced to a minimum. Consult Demeter for approval prior to dehorning or tail docking in all instances. De-beaking of poultry is forbidden, as is tooth cutting and tail cutting of piglets. Nose rings or hog rings that prevent pigs from rooting are forbidden.

It is permitted to castrate calves and piglets to improve the health, welfare, or hygiene of the animals. Immuno-castration is not allowed in pigs. Competent personnel must carry the operation out at the most appropriate age and any suffering of the animals must be reduced to a minimum.

L. Guest Animals

Animals of conventional or organic origin not in the possession of the certified farm can be kept on Demeter certified pastures for grazing provided there are no Demeter certified animals present at the same time or in Demeter stables unless the following conditions are applied:

- A written agreement between the owner of the animals and the farm must be in place.
- All animals must be clearly identifiable by earmarks or comparable marking.
- All animals must be kept according to this standard concerning the management, medicinal treatment, and feeding.
- If guest animals fulfil these requirements, they can be integrated in fodder-manure balance of the certified farm.

If guest animals do not fulfill the above-mentioned requirements and are fed organic or non-GMO conventional fodder the following conditions are required:

- A written agreement between the owner of the animals and the farm must be in place.
- Animals must be clearly separated in stables and on pastures.
- The feeding of the animals must be clearly separated.
- If guest animals are kept under separate conditions, they can be integrated in fodder-manure balance on the basis of a fodder-manure cooperation only if they are kept at least organic.

In both cases an exemption is required from Demeter. The request for the exemption must have a clear description of the circumstances, especially regarding separation measures.

SECTION V

Mushrooms



A. Origin of Spores, Cultures, and Mycelium

It is recommended that a farmer's own mycelium/inoculum material will be developed according to these standards and that this will take over as the starting culture. Spawn may be brought in from organic sources or derived from the wild. When spawn is produced on the Demeter farm the ingredients of agricultural/forestry origin must be Demeter certified, if available.

B. Origin of Growing Substrate

Mushroom substrate must consist of materials derived from organic farming or those permitted for use in organic farming, such as mineral products. Farmyard manure from organic farms containing uncertified straw residues and uncertified agricultural materials—for example, green waste and manures from extensive animal husbandry—may be used as substrate provided they have been composted on an organic or Biodynamic holding for at least 6 months prior to use as mushroom compost. At the start of this period Biodynamic compost preparations must have been added.

Straw harvested in the second year of conversion may be used in the substrate.

In the case of imported wood—for example, oak logs (for shiitake), chippings, or sawdust—no insecticidal treatments may be utilized since original felling.

Peat as a covering material is permitted in mushroom cultures. Other permitted inputs are listed in the appendices.

C. Biodynamic Measures

The compost preparations must be introduced into the substrate at an appropriate stage prior to inoculation. If sterilization is used, the sets of compost preparations should be applied after this has occurred and before subsequent incubation. The horn manure (500) preparation must be applied at least once per crop cycle, after the substrate has been inoculated. The horn silica (501) preparation must be applied at least once per crop cycle.

Timing work activities using astronomic rhythms is encouraged.

D. Illumination

Mushroom species that are known to react to light (for example shiitake) are to be cultivated with light. An exemption may be given by Demeter if climate requires insulated growing sheds.

E. Health of Crop

Prevention is the overriding principle for maintaining the health of the cultures through hygiene, climate control, mechanical pest repellents, and the Biodynamic preparations. Salt may be used to control fungal diseases. Other products for plant pest and disease control are listed in the appendices

F. Cleaning and Disinfection of Growing Sheds

For cleaning mushroom growing rooms and sheds, physical procedures must be used, together with water or steam. Permitted detergents, disinfectants, and other sanitizers are listed in part A section 8 of the Biodynamic Processing Standard. They must be DDAC/BAC free.

Equipment may be sterilized with 70% alcohol or with agents based on peracetic acid. Formaldehyde must not be used.

After cleaning all interior space, surfaces must be rinsed with potable water. This is not required only where the mushroom substrate is introduced after complete biodegradation of the cleaning/sterilizing agent.

G. Recycling of Spent Mushroom Compost

There must be a plan for the routine recycling of all spent mushroom compost. Licensees are encouraged to find Biodynamic operations that can benefit from this material.

SECTION VI

Post-Harvest Handling & Processing



A. Storage and Processing

Storage facilities and containers must be clean and adequately protected from insect or pest infestation. Post-harvest treatment with synthetic chemicals is prohibited.

Shipping arrangements must guard against contamination of produce from other farms and from exposure to prohibited materials that could arise while certified product is in transit.

The *Demeter Biodynamic Processing Standard* applies to all on-farm and farm-contracted processing.

B. Labeling and Packaging

Product labeling must be approved by Demeter. If changes are made to the ingredients, the label and the Individual Product Profile needs to be re-submitted for approval. Changing ingredients without approval is prohibited. Packaging and accompanying documents must be labeled in such a way that the product can be traced back to the farm.

Demeter may require approval of promotional materials before publication.

Please see the *Demeter Labeling Standard* for more information.

C. On-Farm Processing, Off-Farm Grower-Contracted Processing, and Packing

Processing done on-farm or by a contracted processor must meet the *Biodynamic Processing Standard*. This includes slaughter of livestock, cleaning and bagging, canning, freezing, drying, roasting, fermenting, culturing, baking, etc.

D. Water Quality

Tailing water (water that drips off product after rinsing) or water used as an ingredient cannot exceed 4 ppm chlorine.

Water used needs to meet EPA and state safe drinking water standards.

SECTION VII

Administration



The *Biodynamic Farm Standard* applies to the certification of farms and ranches for the purpose of allowing their farms and ranches, and resulting agricultural products to carry the Demeter certification marks "Biodynamic®" and "Demeter®" and the related logos using these marks. Processed products must meet the *Biodynamic Processing Standard* to be referenced as such. These are registered certification marks that are vigorously protected from misuse by non-certified operators.

The *Demeter Biodynamic Farm and Processing Standards* meet the minimum requirements set by Biodynamic Federation Demeter International. These base standards form a common legal foundation and agricultural framework for Demeter Biodynamic® practice worldwide. The responsibility for adherence lies with each grower and processor.

A. Determining What Can Be Certified

Since Biodynamic farming principally views the farm as a self-contained organism, only an entire farm will be considered for certification. Individual fields or crops cannot be certified. More than one farm may be counted as a single certification unit under certain conditions.

Each farm is considered a unique individuality, with its own beginning point and inherited environmental and social conditions. What is critical is that a farm evolves towards its maximum potential as a self-contained individuality. Some applicants' farms may enter this program very close to this maximum potential. Others will require an evolution towards it. While Demeter is here to provide assurance that the Standards are met, it is also here to nurture farmers and their farms towards this ideal.

B. Prerequisites

The land to be certified must meet the National Organic Program (NOP) standard as a base and be managed to the *Biodynamic Farm Standard* for one year. The one-year conversion to Demeter certification begins with the first Biodynamic preparation application (500, 501 or 502-507 in combination) and may occur concurrently with the final NOP transition year or an additional year after the NOP standard has been met. No prohibited chemicals may have been applied for a full 36 months. Demeter may request residue tests for prohibited materials.

Transition example of a conventional farm:

June 1, 2022	Prohibited herbicide applied
June 2, 2023	12 months – 1st year transition ends (All Biodynamic preparations may be applied, and farm is managed to the *Biodynamic Farm Standard*)
June 2, 2024	24 months – 2nd year transition ends (All Biodynamic preparations may be applied, and farm is managed to the *Biodynamic Farm Standard*)
June 2, 2025	36 months – Crop harvested on or after this date is eligible for Biodynamic certification (The first Biodynamic preparation must be applied one year prior to certification, Biodynamic preparations 500-507 must be applied within last year of transition, and farm must be managed to the *Biodynamic Farm Standard* for one full year)

Conversion example of a farm that meets NOP organic requirements:

On or before June 1, 2024	Entire farm meets NOP organic requirements
June 1, 2024 to June 2, 2025	First Biodynamic preparation applied on June 1, all remaining Biodynamic preparations applied within first year to production areas, and entire farm is managed to the *Biodynamic Farm Standard*
June 2, 2025	12 months – Crop harvested on or after this date is eligible for Demeter Biodynamic certification

Any processing and/or packaging facilities on the farm or contracted by the grower must be included in the farm certification process, and an additional questionnaire and inspection of the facilities is required.

C. Steps to Certification

1. SUBMIT COMPLETED APPLICATION

A producer planning the transition of a farm from conventional or conversion of organic to Biodynamic should start the process by requesting an application from the Demeter office. The application includes the initial application, which asks for the past management of the land to be certified and the proposed plan to move towards Demeter certification. The application documents the current situation of the farm and the plan to meet the *Biodynamic Farm Standard*.

It is recommended, but not required, that new applications be submitted prior to April 1 so that the farm inspection can be planned and conducted during the growing season.

2. ARRANGE A FARM VISIT

After Demeter receives the completed application and appropriate fees, the application is reviewed and assigned to an inspector who will contact the applicant to arrange a farm visit. During the visit, the information entered on the application will be verified and clarified.

3. FOLLOW UP ON THE FINDINGS REPORT

The inspector's report and the grower's application will be reviewed by Demeter for compliance with the *Biodynamic Farm Standard* and Demeter will establish any requirements and recommendations in a Findings Report. The Demeter office will then notify the applicant of the certification decision and forward the Findings Report if there are suggested actions and/or requirements. The applicant is required to acknowledge the Findings Report and resolve any requirements. If certification is not granted, an explanation will be provided.

A licensee wishing to amend the scope of an existing certification should write to the Demeter office giving details in support of the request. The Demeter office will decide what additional information is needed, if any. A revisit to the facility may be required.

D. In Transition and In Conversion Timeline

A farm may be considered "in transition to Biodynamic" under the following circumstances:

1. The farm has submitted an application.
2. A Demeter inspector has been to the property.
3. Demeter has reviewed the inspection report and determined that certification could be obtained within a three-year period.
4. The farm has resolved any Findings Report requirements identified by Demeter.
5. There is a projected date of certification (month/year).

A farm may refer to itself as "in transition to Biodynamic" in its marketing materials, website, and other ways that are not product labeling or at the point of sale to the consumer.

If the farm is not already NOP certified, then Demeter will conduct yearly inspections up to the three- year date of certification to ascertain that the *Biodynamic Farm Standard* is being upheld. The final Biodynamic certification must take place within 3 years and 3 months of the initial inspection.

If all the above requirements are met and a farm meets NOP organic requirements, Demeter will issue a certificate indicating that a farm is "Certified In Conversion to Biodynamic" and the farm can represent itself in this manner in literature, website, and other marketing material. Farm crops, fibers, and livestock may be labeled as "In Conversion to Biodynamic®" and included in Demeter certified processed products making an "In Conversion to Biodynamic®" or "Made with In Conversion to Biodynamic®" label claim. See the *Biodynamic Labeling Standard*.

If a farm already meets NOP organic requirements, the full Demeter Biodynamic certification should take place one year from the initial Biodynamic preparation application, with an allowance of 3 months in addition to the year.

E. Exemptions to Whole-Farm Certification

If any crops or land belonging economically to a farm cannot be farmed according to the *Biodynamic Farm Standard* because of serious technical considerations, then exceptions of particular fields, animals, or products need the written consent of Demeter. Such not-fully-converted products must be clearly separated from the converted fields, animals, or products, and no interchange should be possible. Such crops, animals, and products must be specifically indicated on the application for certification and specified on the certificate. They must be clearly labeled and easily distinguished in farm sales, whether direct or through distributors. Parallel production is not possible under the same farm identity.

Animals for home consumption can be taken out of certification without violating the conversion of the whole farm, but cannot be marketed as Demeter or Biodynamic.

F. Newly Acquired Property

When a Demeter certified Biodynamic farm leases or purchases land that has been managed conventionally or organically, these acres must also be converted. Existing farm certification is not forfeited, but crops from the transitional areas are to be of a different variety, demonstrably separated in storage, and designated under another name and sold as non-certified.

G. Public Disclosure

Upon legitimate request, Demeter will make available to the public the certification classification and the number of years certified. If a Demeter member wants this information kept confidential, the member must inform the Demeter office. Evaluation reports are not made available except to other certifying agencies at the request of the

certified party. A certified farm should have available for their customers a copy of their current Certificate.

H. Annual Renewal of Certification

Following the first year's certification, Demeter sends out a Renewal Packet annually. A farm must have its certification renewed every year. Certification is contingent upon the receipt of a fully filled-out Renewal Packet and the completion of a satisfactory on-site farm evaluation conducted during the growing season. Farmers must resolve any issues found to be out of compliance.

The Renewal Packet includes a declaration by the farmer, given in good faith and to the best of his/her knowledge, concerning the completeness and correctness of information supplied. Any anticipated changes in agricultural management or any measures that could have a significant influence on the farm must be discussed with Demeter.

Note: *Demeter may conduct random unannounced visits. We acknowledge that this may interfere with planned farm activities, and we will do our best to limit the interference. Licensees are requested to cooperate to the fullest extent possible.*

I. Revisions to Guidelines and Standards

Demeter periodically revisits its Standards and makes revisions. Licensees receive notice of all revisions and have one year to fully implement the changes from the time of notice. Inspectors and Demeter reviewers will verify that each licensee has made the needed adjustments. Licensees are responsible for compliance.



J. Recordkeeping

Adequate records must be kept concerning all aspects of farm operations for five years and records must be readily auditable. All records must be made available to Demeter upon request.

Example records

Field records	• All materials applied, date and rate of application, name and source of all inputs, acreage, and type of crops to which inputs are applied. • GMO status of seeds, inoculants, and plant protection materials. • Labels or other documentation showing potting soils and manure.
Harvest records	• Records of the harvest, segregation, and sale of non-certified buffer crops, in transition crops, and In Conversion crops. It is advisable to retain documents to support this. • Records of all harvested crops, bin storage location, if applicable, and sales records. • Sales records should have a lot number such as a date or other code and be traceable to the field of origin. • Equipment cleaning records, if applicable.
Livestock	• Date purchased, source, weight, and age at acquisition. • Amount of feed and supplementation purchased including certificates and feed tags. • Medications: vaccinations, illness/injury treatments including medicament labels. • Production records. • Date, ID number, and certification status at time of slaughter or sale of animals. • Feed emergency documentation.
Inputs	• Manure – type, amount, source, quality. • Other fertility – type, brand name, amount, source, ingredients. • Seed – type, amount, source, classification as organic, Biodynamic, conventional, treated, untreated, GMO status. • Plant protection materials, GMO status. Maintain all labels for the annual visit.
General	• Complaint log to register any complaints against the certified product or production.

K. Contract and Use of Certification Marks

Only the execution of a written contract between Demeter and the applicant and issuance of a Farm Certificate confers the license to use the Demeter certification marks "Demeter®" and "Biodynamic®". Please see the *Demeter Labeling Standards* for more information.

Neither the contract nor the Certificate confers labeling rights upon packagers and processors to whom certified product is sold. If a packager or processor intends to sell a Demeter certified product they must apply independently to Demeter for a license.

APPENDIX A

Composition of Various Manures

Figures presented as fresh manures. Dried manures can contain up to five times the amounts of nitrogen, phosphoric acid, and potash. Figures can vary depending on how manure is handled, what the animals are fed, and type of bedding used (if any).

		Excrement %	H2O %	Nitrogen	Phosphoric acid	Potash
Horse	solid	*80*	75	.55	.3	.4
	urine	20	90	1.35	Trace	1.25
Cow	solid	70	85	.40	.2	.1
	urine	30	92	1.00	Trace	1.35
Sheep	solid	67	60	.75	.5	.45
	urine	33	85	1.35	.05	2.1
Swine	solid	60	80	.55	.5	.4
	urine	40	97	.40	.1	.45
Hens	solid	100	55	1.00	.8	.4

Source: H.O. Buckman and N.C. Brady, *The Nature and Properties of Soils* (New York: Macmillan Co., 1965), page 509

APPENDIX B

Permitted and Restricted Fertilizers and Soil Conditioners

In principle, the enterprise is to aim for self-sufficiency in its manures and fertilizers. Importation of the brought in substrates, fertilizers, and soil conditioners listed below may only be as demand dictates. The use of brought-in materials requires particular care with respect to their effects on the quality of Demeter products. The Biodynamic preparations are to be used if possible. Brought-in materials are to be declared in the annual certification procedure. In some cases, the results of a residue test are to be supplied (for example, for compost from green material). In general, this standard is designed as a positive list; what is not listed is prohibited.

Appropriate systems must be applied to prevent the contamination of certified land by residues of veterinary remedies, feed additives such as antibiotics, natural feed contaminants such as mercury in fish meal, and other residues such as herbicides in the litter.

1. Fertilizers and soil conditioners brought in from Demeter or Organic certified sources:

   a. Compost
   b. Stable manure, liquid, and semi-liquid manures from animals
   c. Liquid fertilizers from plants
   d. Organic wastes (harvest residues, etc.)
   e. Straw
   f. Spent mushroom compost
   g. Residues from biogas extraction only if substrates are listed in this section (Demeter or organic sources)

2. Fertilizers and soil conditioners brought in from non-certified sources:

   a. Manures as much as possible prepared at the place of origin from livestock with a stocking rate of less than 1 animal unit / acre (one animal unit = 1000 lbs. of animals).
   b. Straw and other plant materials.
   c. Fish, composted or fermented with the preparations or applied along with Barrel Compost or similar. Testing for heavy metals may be required. Factory fishmeal or fish wastes from fish farming are excluded.
   d. Seaweed products. Used sparingly for reasons of resource depletion.
   e. Vegetable carbon/biochar.
   f. Eggshells.
   g. Fresh wood products: sawdust, bark, and wood wastes (as long as they are not contaminated with fungicides and insecticides) and wooden ash from untreated wood.
   h. Peat (without synthetic additives) for growing seedlings, as long as no alternatives are available. Used sparingly for reasons of resource depletion.

i. Fermented molasses.
j. Bruised castor seeds.
k. Manure from nomadic livestock as much as possible prepared at the place of origin
l. Concentrated fertilizers* (which shall be composted with the Biodynamic preparations or applied along with Barrel Compost or similar before they are applied to the fields whenever federal and state legislation allows) such as:
    i. Farmyard manures such as dried chicken manure
    ii. Horn meal
    iii. Bone meal
    iv. Meat and bone meal
    v. Dried blood
    vi. Hair, feather, and other similar products
    vii. Plant and fungi residues or by-products of plant or fungi processing, such as vinasse and molasses

* Concentrated fertilizers: Fertilizers of a non-mineral nitrogen source, which are processed other than with a simple drying or composting. They are usually sold in bags and can be shipped more widely than farm manures. They can be singly or as a mixture of i – vii above.

Note: *Concentrated fertilizers of a conventional origin are permitted until the end of 2028. After this, these fertilizers must be made solely from Biodynamic or organic sources. Application rates of concentrated fertilizers are restricted according to Table 1.*

3. Fertilizers and soil conditioners of natural mineral origin:

a. Rock dusts (composition must be known)
b. Pulverized clays (e.g., bentonite)
c. Calcium chloride (CaCl): may only be used to address bitter pit in apples
d. Lime fertilizer: slow-release types to be used in principle (dolomite, calcium carbonate, seashells, calcified seaweed only from dead marine deposits or fossil forms on land)

4. Only if the results of soil testing, tissue/leaf analysis, or other deficiency symptoms prove the need may the following materials be used:

a. Natural phosphate rock, low in heavy metals
b. Ground basic slag
c. Crude potassium salts, potassium magnesium sulphate, and potassium sulphate (chloride content maximum 3%), only minerals from natural sources (only physical separation of the salts is allowed).
d. Magnesium sulphate
e. Sulphur
f. Trace elements

5. Miscellaneous:

a. Water-soluble seaweed extracts
b. Extracts and preparations from plants
c. Microbial or plant-based compost activators
d. Soil inoculates: non-GMO (e.g., algae extract, grain ferments, N-fixing bacteria, mycorrhizae, rhizobia bacteria)

e. Seed aids (e.g., rock flour, naturally occurring polymers)
f. Fertilizer additives (e.g., calcium carbonate, zeolite)
g. Vermicompost: status of feedstocks determines whether this input is considered raw manure or compost

6. Substrates, soils, pots, and technical aid material:

a. Degradable pots
b. Degradable binding material
c. Substrate for pressed pots (according to these Standards)
d. Cultivation substrate (according to these Standards)
e. Substrate additives (vermiculite, lava rock, perlite)

APPENDIX C

Allowable Materials and Methods for Plant Care

The material listed here, especially under #3 and #4, may only be used in cases of proven need and only if the Biodynamic measures cannot bring the problem under control. It should be kept in mind that use of some materials (e.g., Microfine sulfur, pyrethrum) could possibly endanger predator insect populations. New materials and methods may be trialed only with the agreement of Demeter. If commercial inputs are brought in, care must be taken that they are free from constituents prohibited in these standards and are not produced by transgenic methods.

1. Biological agents and technologies:

   a. Encouragement and use of natural control agents for plant pests (predator populations of mites, parasitic wasps, etc.)
   b. Sterilized male insects
   c. Insect traps (e.g., colored boards, sticky traps, attractants)
   d. Pheromones (sex-attractants, attractants in traps and dispensers)
   e. Mechanical repellents (e.g., mechanical traps, slug and snail fences)
   f. Repellents (non-synthetic agents to deter and expel pests): Application only on plant parts not for consumption by humans and animals
   g. Painting (e.g., insect lime)

2. Adhesion aids and materials to promote plant health:

   a. Preparations that promote plant disease resistance and inhibit pest and diseases—e.g., plant preparations (stinging nettle liquid ferment, equisetum tea, comfrey tea, wormwood tea), propolis, milk and milk products
   b. Sodium silicate and potassium silicate
   c. Spreader/stickers approved for certified organic production
   d. Homeopathic preparations
   e. Quartz sand, aluminum silicate
   f. Chitosan

3. Agents for use against fungal attack:

   a. Wettable sulfur and flowers of sulfur
   b. Sodium silicate and potassium silicate
   c. Potassium bicarbonate
   d. Essential oils
   e. Microorganisms/bacterial preparations
   f. Sodium bicarbonate

g. Plant extracts if extraction method complies with this Standard and the product does not contain any other aids like carriers or preservatives
h. Sodium chloride
i. Cerevisan

4. Agents for pest control:

a. Microorganisms: Virus, fungal and bacterial preparations (e.g., *Bacillus Thuringiensis*, *Granulose Virus,* Spinosad). *See Appendix I for potential restrictions on use.*
b. Pyrethrum extracts and powder, except for mushroom production (no synthetic pyrethroids). The use as protection in storage is allowed only if no chemical synergists are included in the formulation. The same regulation applies in agricultural production if materials with equally effective natural synergists are available. *See Appendix I for restrictions on use.*
c. Quassia tea
d. Oil emulsions based on vegetable (all crops)
e. Oil emulsions based on mineral oil (only for perennials)
f. Potassium soaps (soft soap), fatty acids
g. Gelatin, hydrolyzed proteins
h. Fe (III) Orthophosphate (molluscicide)
i. Azadirachtin (Neem - insecticide)
j. Anti-coagulant rodenticide for use in stables or other housing (only in bait boxes or similar so that predators are not jeopardized)
k. Rock flour, coffee
l. Agents for use in stables and on animals: Diatomaceous earth, sticky fly-tapes, essential oils
m. Maltodextrin
n. Terpene (eugenol, geraniol, and thymol)
o. Sodium chloride

5. Allowable aids on specialized crops, perennial crops, and ornamental plants:

a. Diatomaceous earth: *See Appendix I for restriction.*
b. Calcium hydroxide
c. In cases of need, copper may be used such that the average amount used over 7 years shall not exceed 2.7 lbs./acre/year (copper equivalent), preferably with a maximum of 1 lb./acre/spray. In wine- and hop-growing regions with high fungal pressure, Demeter may grant an exemption for the use of an average amount of up to 3.6 lb/acre/year over 5 years; this is restricted to grapes and hops only.
d. Sulfur preparations such as Hepar Sulphuris, lime sulfur (fungicide, insecticide, acaricide)
e. Ethylene for flower induction in pineapples

APPENDIX D

Allowable Brought-In Feeds

1. Ruminant diets:

   a. Basic staple feeds like hay, straw, silage, maize, and beets
   b. Grain, bran, grain offal
   c. Pulses
   d. Hay made from foliage
   e. Herbs
   f. Molasses
   g. Grassland and arable products not mentioned elsewhere
   h. Fodder mixes containing the above-mentioned ingredients
   i. Litter of fruits and vegetables
   j. By-products of processing (animal products excluded)

2. Pigs (in addition to the feeds listed above):

   a. Milk products and skim milk powder without additives
   b. Plant oils of natural origin (providing there is no concern about residue levels)
   c. Clean vegetable litter
   d. Whey and eggs

3. Poultry (in addition to the feeds listed above):

   a. Milled dried herbage
   b. Paprika powder

APPENDIX E

Allowable Feed Extenders and Additives

1. Stock salt
2. Calcified seaweed, feed lime, lime from seashells
3. Seaweed
4. Mixtures of minerals and vitamin preparations allowed in organic production. Synthetic amino acids are not permitted.
5. Rock flour, cod liver oil, carob
6. Plant oil, bran, brewer's yeast, molasses as a carrier in mineral concentrates or as an aid to reduce dust, or as an aid in pressing (max. 2% of the production ration)
7. For beekeeping: sugar (for allowed limits refer to *Demeter Beekeeping and Hive Products Standards* for the use of "Demeter", "Biodynamic®", and related trademarks). Pre-mixes must not contain any genetically modified substances or be produced with the help of gene technology. Written proof to this effect must be supplied to Demeter.
8. The following are allowed as aids in the silage-making process:
    a. Feed-grade sugar
    b. Grain meals from grain produced to these standards
    c. Lactic acid promotion agents
    d. Whey
    e. Molasses, salt, wet and dry cuttings
    f. To ensure the quality of fodder in years with bad weather conditions: Organic acids (GMO-free)

APPENDIX F

Calculation of Stocking Rates

The stocking rate takes into account the development and maintenance of soil fertility. The maximum amount of nitrogen and phosphorus that may be supplied by way of the fertilization used may not exceed the amount that would be produced by those animals that the farm could support from its own fodder production. Manure Units -measurements of fertility potential - are used to determine stocking rates for the various animal types. One manure unit is equivalent to 176 lbs. of N and 154 lbs. of P.

The stocking rate is calculated utilizing Livestock Units (LU) and the corresponding annual production of Manure Units (MU), associated with various animals. One LU excretes .7 MU annually. The maximum stocking rate may not exceed 0.8 Livestock Units/acre (.56 manure units/acre) if feed is imported. This is the equivalent of 100-lbs/acre of applied N and 87-lb/acre applied P. Note that this stocking rate might not be possible in all climates. The maximum allowed may need to be reduced if conditions require it in order to maintain the health of the farm.

Stocking Rate: Animal type	LU/animal	Acres/animal	Animals/acre
Breeding bulls	1.2	1.50	.66
Cows	1	1.25	.80
Cattle over 2 years old	1	1.25	.80
Cattle 1-2 years old	0.7	.87	1.14
Calves	0.3	.38	2.60
Sheep and goats up to 1 year old	0.02	.03	40.0
Sheep and goats over 1 year old	0.1	.13	8.0
Horses under 3 years old and young horses	0.7	.87	1.14
Horses, 3 years and older ponies and small breeds	1.1	1.42	.7
Pigs for meat production (45- 110 lb.)	0.06	.08	13.0
Pigs for meat production over 110 lb.	0.16	.20	5.0
Breeding boars	0.3	.39	2.6
Breeding sows (including piglets to 45 lb.)	0.55	.67	1.5
Breeding sows without piglets	0.3	.38	2.6
Piglets	0.02	.03	40.0
Laying hens (without replacement stock)	0.0071	.009	112.6
Pullets	0.0036	.004	222.0
Table birds (chickens, cockerels for meat)	0.0036	.004	222.0

APPENDIX G

Fertility Calculation Worksheet for Imported and Applied Materials

Imported Nitrogen and Phosphorus

The *Biodynamic Farm Standard* allows for a maximum of 36 lbs. N/acre and 31 lbs. P/acre averaged over the crop rotation/cultivated area to be imported annually. Farm acreage that does not apply to the calculation is acreage that is permanently set aside as biodiversity reserve, such as wild areas, permanent insectaries, etc. Acreage that is in the rotation but fallow in a given year does apply as does pasture being grazed or hayed.

An annually reviewed exception to this rule, based on documented need, allows for 86 lbs. N/acre and 75 lbs. P/acre of cultivated area to be imported annually. Examples of need include newly established farms with inherently low fertility soils, new perennial plantings that require higher N levels to get established, etc.

If a horticulture system is one for which it can be documented that a minimum of 100 lbs. N/acre is exported in the form of the crop leaving the farming system as a harvested commodity, a farm may import a maximum of 150 lbs. N/acre and 125 lbs. P/acre. Since this amount is equal to the maximum applied/acre there is no need to do a separate calculation for the imported amounts.

Example Calculation:
A 300-acre farm with 100 acres in its crop rotation in a given year imports 50 tons of approved cow manure for compost and 30 gallons of approved fish.

a) Cow manure analysis 1-1-1 (**dry matter basis**)
100,000 lbs. x 1% N(.01) = 1000 lbs. N imported
100,000 lbs. x 1% P(.01) = 1000 lbs. P imported

b) Liquid fish analysis 5-1-1
1 gallon = 8 lbs. 50 gallons = 400 lbs.
400 lbs. x 5% N(.05) = 20 lbs. N imported
400 lbs. x 1% N(.01) = 4 lbs. P imported

Imported Nitrogen = 1,020 lbs. (1000 lbs. manure, 20 lbs. fish). 1020 lbs. divided by 100 acres = 10.2 lbs. N/acre imported. **Compliant with the import fertility limit of 36 lbs N/acre.**

Imported Phosphorus = 1,004 lbs. (1000 lbs. manure, 4 lbs. fish). 1,004 lbs. divided by 100 acres= 10.05 lbs. P/acre imported. **Compliant with the imported fertility limit of 31 lbs. P/acre.**

Applied Nitrogen and Phosphorus

The *Biodynamic Farm Standard* allows a maximum application of 100 lbs. of Nitrogen/acre and 87 lbs. of Phosphorus (P)/acre averaged annually over the farm's crop rotation/cultivated area.

Farm acreage that does not apply to the calculation is acreage that is permanently set aside as biodiversity reserve such as wild areas, permanent insectaries, etc. Acreage that is in the rotation but fallow in a given year does apply as does pasture being grazed or hayed.

An exception to this rule is given when a horticultural cropping system is one for which it can be documented that a minimum of 100 lbs. N/acre is exported in the form of the crop leaving the farming system as a harvested commodity. With such documentation a farm may apply a maximum of 150 lbs. N/acre and 125 lbs. P/acre annually.

Green manures produced and incorporated on farm are excluded from the calculation.

Example: Applied Fertility Calculation
The same 300-acre farm with 100 acres in its crop rotation that is importing fertility calculated as above in addition to supporting 30 cows on the farm.

a) The imported cattle manure (dry matter basis) and fish as imported above = 10.2 lbs. N/acre and 10.5 lbs. P/acre.

b) 30 cows = 30 Livestock Units (LU) [per Appendix F of Biodynamic Farm Standard: 1 LU = .7 Manure Units (MU). 1 MU = 176 lbs. N and 154 lbs. P]
    1. 30 LU x .7 = 21 MU
    2. 21 MU x 176 lbs. N= 3,696 lbs. N applied by 30 cows. Divided by 100 acres = 36.96 lbs. N/acre applied.
    3. 21 MU x 154 lbs. = 3,234 lbs. P applied by 30 cows. Divided by 100 acres = 32.34 lbs. P/acre applied.

Total applied Nitrogen =
10.2 lbs./acre (imported manure)
+ 36.96 lbs./acre (30 Manure Units on farm)
= 47.16 lbs. N/acre applied **Compliant with the total applied limit of 100 lbs. N/acre.**

Total Applied Phosphorous =
10.5 lbs./acre (imported manure)
+ 32.34 lbs. P/acre (30 Manure Units on farm)
= 42.84 lbs. P/acre **Compliant with the total applied limit of 87 lbs. P/acre.**

APPENDIX H

GMO Crops of Concern

If any of the crops below are grown to be Demeter certified, assess whether or not there is significant production of genetically engineered varieties of the crops within the following distances:

Alfalfa - 2 miles
Canola - 2 miles
Corn - 3 miles
Cotton - 2 miles
Papaya - 2 miles
Rice - 500 feet
Soybean - 500 feet
Beets - 5 miles
Zucchini/yellow crookneck squash - 2 miles

Please note that this information will be used to assess whether or not testing is necessary based on review of the situation at hand. Some of the crops listed above exist in genetically engineered form but are not grown extensively (such as zucchini and yellow crookneck squash). Some, such as alfalfa, are not currently grown extensively but could be in the future. Some, such as canola, corn, cotton, and soybean, are grown extensively. For farms located in regions where there is extensive production of genetically engineered varieties of crops, the potential for contamination needs to be examined closely.

APPENDIX I

Exemption for Use

Certain pest control materials allowed/regulated in both certified organic and Biodynamic® production have been shown to have a negative effect on the ecological balance of a farming system, such as inhibiting pollinators and other beneficial organisms. The negative effect is either due to the fact that the material is broad spectrum (killing both the pest species and beneficial species) or applications negatively affect specific important beneficial populations such as bees and pollinators. Examples of such materials include copper sulfate, pyrethrum, diatomaceous earth, insecticidal soap, Spinosad, and *Beauveria bassiana*.

Note: *some other broad-spectrum materials allowed in NOP organic production, such as ryania and sabadilla, are prohibited in Demeter Biodynamic production and no exemption is available for their use.*

In addition to current Demeter and NOP Standards concerning the importation and usage of pesticide materials, Demeter USA requires an exemption to use copper sulfate, pyrethrum, diatomaceous earth, insecticidal soap, Spinosad, and *Beauveria bassiana* with the following applied criteria.

1. Usage of material must be done at times when there is the least likelihood of contact with beneficial organisms.
2. Broadcast blanket applications should be avoided and instead control should be based on spot spraying and the use of traps/attractants to lure the pest to the pesticide.
3. Prevention and management strategies noted in the Biodynamic Farm Standard sections on pest control have been implemented.

This exemption will be addressed based on the Annual Update and annual review of all materials proposed in crop production. Adherence to this plan is verified via the annual farm visit. Thus, exemption approval is on an annual basis, and it is not necessary to seek exemption approval prior to each use.

APPENDIX J

Biodynamic Preparations Defined

500

Sheath	Raw cow horn from bovine species.
Material	Fresh cow manure from bovine species. From a cow that resides on a farm using Biodynamic or Organic practices at a minimum.
Processing	Manure packed into the horn as tightly as possible.
Burial	Well-drained site. In a spot with good soil with good humus content and biological activity. Steiner suggested 18 - 32 inches deep. Adjust to local conditions. The horns are buried in the fall and allowed to be in the ground through the duration of the winter.
Finished Product	Material removed from the horn must have completely transformed to a colloidal humus material.

501

Sheath	Raw cow horn from bovine species.
Material	Quartz - silicon dioxide, feldspar, orthoclase, minerals of high silicon dioxide content, naturally occurring.
Processing	Silica ground and mixed to a fine mealy powder and mixed with water to the consistency of a very thin dough. Place in horn.
Burial	Horns buried in spring to be in the Earth for the duration of the summer.
Finished Product	Stored in a sunny location.

502

Sheath	Stag bladder (male deer or elk species).
Material	Yarrow flowers, *Achillea millefolium*. From a farm using Biodynamic, organic practices, or wildcrafted.
Processing	Pick the fresh inflorescences. If fresh is unavailable, use dried flowers moistened w/ juice or infusion of yarrow leaves. Take yarrow, and compressing it somewhat, take the bladder and enclose the yarrow- substance in this as best you can, then tie the whole thing shut. Hang it up outside in the sunniest spot you can find, and let it stay there through the duration of the entire summer.
Burial	When autumn comes, then take it down and put it in the ground—not too deeply (adjust for local conditions)—and let it spend the winter there. You thus have yarrow flowers enclosed for a full year within the bladder partly above ground and partly below ground.
Finished Product	When digging up take caution to only harvest the yarrow blossoms that have spent a year in the bladder. Avoid any surrounding material. Yarrow should have transformed towards humus-like material, though some form of original florets may still be identifiable. Store properly.

503

Sheath	Intestine of cow bovine species.
Material	Chamomile blossom, *Matricaria recutita*. From a farm using Biodynamic, organic practices, or wildcrafted.
Processing	Pick the fresh inflorescences. If fresh is unavailable, use dried flowers moistened with infusion of chamomile. Take the chamomile and, compressing it somewhat, take the bovine intestine and stuff with the chamomile blossoms, making sausages. Tie ends with untreated, natural material or fold ends over.
Burial	Make and bury the sausages in autumn. Bury not too deeply in soil as rich as possible in humus. Let them spend the entire winter underground. Dig up in spring.
Finished Product	When digging up take caution to harvest only the material in the sausage. Chamomile should have transformed towards humus-like material. Store properly.

504

Sheath	No sheath. Separate the nettles from the surrounding soil so the preparation harvested does not have surrounding soil mixed in.
Material	Stinging nettles (perennial, *Urtica dioica*). From a farm using Biodynamic, organic practices, or wildcrafted. Use the aerial portion during flowering or before.
Processing	Gather nettles, let wilt slightly, compress a bit, and place in soil.
Burial	Bury in living topsoil. Let it spend the winter and the following summer in the ground; it must be buried for a whole year.
Finished Product	When digging up take caution to harvest only the buried nettle. Nettle should have transformed towards dark-colored, colloidal humus material. Store properly.

505

Sheath	Skull of a domestic animal. Examples: cow, goat, pig.
Material	Crumbled oak bark, *Quercus species.*
Processing	Chop bark up to a crumb-like consistency, put into the skull brain cavity, enclose with natural material such as bone, wood, clay, etc.
Burial	Into watery (mucky) earth where water can flow in and out, but not too deep. Bury in the fall so that it remains over winter.
Finished Product	After fall and winter remove oak bark from skull cavity. Oak bark should have transformed towards humus material. Store properly.

506

Sheath	A bovine mesentery (peritoneum). Inside of the peritoneum towards the dandelion flowers.
Material	Yellow heads of dandelion (*Taraxacum officinale*). Flowers can be dried in the shade then stored properly until needed.
Processing	Pack the dandelion blossoms together and sew (or wrap) them up in bovine mesentery (peritoneum).
Burial	Bury in earth in autumn, buried through the winter. Dig up in spring.
Finished Product	Blossoms should transform towards earthy-smelling humus material. Store properly.

507

Sheath	N/A
Material	Valerian blossoms (Valeriana officinalis) or other local wildcrafted species. Biodynamic quality, if not organic, or wildcrafted at a minimum. Majority of flowers on individual plants used open at harvest. As little stem material as possible.
Processing	Juice or ferment the blossoms the same day as picking.
Burial	N/A
Finished Product	Valerian juice. Distinctive, pungent valerian aroma.

508

Sheath	N/A
Material	*Equisetum arvense* (indicated by Steiner), used dried or fresh. Other forms of equisetum species sometimes used.
Processing	If drying, dry in shade with not too intense of heat. Aim to maintain vibrant green color. For making 508 liquid, prepare a tea or concentrated decoction.
Burial	N/A
Finished Product	A kind of liquid tea once brewed and possibly fermented. As stored Biodynamic preparation, *Equisetum arvense* is a dried herb.