

# Certified Naturally Grown Mushroom Standards

## Outline

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Appendix A.



### 1. Site Location and Buffers

Producers must maintain an adequate buffer between their operation and potential sources of contamination, such as from another farming operation, to minimize the risk of contamination from drift of pesticides, herbicides, and other prohibited substances. The required size of the buffer varies based on the neighboring activities, what substances are used, how they are applied, prevailing wind patterns, and any physical barriers between potential sources of risk and the mushroom production site. See below for general recommendation. The adequacy of actual buffers will be determined in consultation between the producer, Certified Naturally Grown staff, and inspectors.

- Required
  - An adequate distance shall be maintained to prevent contamination of mushroom production site by nearby potential sources of contamination.
  - For indoor production, the producer must ensure air intake vents are not located close to likely sources of contamination, such as a school or restaurant kitchen exhaust or fume hood from a factory or auto body shop.
  - Indoor operations shall comply with local building codes.
- Recommended

Neighboring land use (for outdoor sites)	Recommended buffer
Urban/residential, where neighboring	20 ft or more,

parcels may be sprayed with home use synthetic herbicides, pesticides, or fertilizers (applied by hand, low to the ground)	tall windbreaks
Conventional crops, synthetic chemicals sprayed low to the ground	25 ft or more, tall windbreaks
Conventional orchard or tree farm, where spray is angled upwards and intended to cover tall vegetation/trees	100 ft or more, tall windbreaks
Crops, orchards, or tree farms where spray is applied aerially by helicopter or crop dusting plane	200 ft or more, tall windbreaks

- Producers should contact neighbors to discuss adjacent land uses and activities to gain more information about potential contamination risks and to notify them of producer’s Certified Naturally Grown status.
- Prohibited:
  - Substrate may not be directly placed on any surface contaminated with heavy metals or other synthetic pollutants.

## 2. Substrate and Fertility Materials

- Required
  - When obtaining logs, producers must adhere to any state or local quarantines for forest products (typically from the state Department of Environmental Conservation or Forestry).
  - When using agricultural waste of crops that are typically genetically modified (GMO), such as cottonseed hulls or corn meal, producer must verify the substrate is not waste from a GMO crop.
- Recommended
  - Logs should be harvested according to a forest management plan that is developed in consultation with a professional forester, such that log removal will maintain or help improve the overall health of the forest
  - Obtaining substrate from the cleanest, most sustainable source possible
- Allowed
  - Logs and stumps from non-GMO wood
  - Wood chips, and sawdust from untreated, non-GMO wood
  - Straw (wheat, oat, rye and other cereals) from non-GMO crops
  - Coffee grounds
  - Agricultural waste from non-GMO crops
  - Supplements that are non-GMO such as wheat bran, rye grains
  - Manure that meets the following criteria:

- A. Manure is from animals that are not given GMO or other conventionally grown feed and
- B. Manure must be either pasteurized or adequately composted, or both.
  - Manure is adequately composted if it is produced through a process that:
    - Established an initial C:N ration of between 25:1 and 40:1; and
    - Maintained a temperature of between 131F and 170F for 3 days using an in-vessel or static aerated pile system; or
    - Maintained a temperature of between 131F and 170F for 15 days using a windrow composting system, during which period the materials must be turned a minimum of five times
- Gypsum in compost

- Prohibited

- Any substrate or supplements that are a byproduct of genetic engineering or GMO crops (most cornmeal, cottonseed hulls, soybean meal)
- Cardboard, except unprinted cardboard used for spawn production
- Paper, except coffee filters
- Clothing and other fabrics
- Manure that is neither pasteurized, nor properly composted according to standards outlined above
- Manure that is from animals that are given GMO or other conventionally-grown feed
- Municipal compost
- Sawdust from treated wood
- Tree stems or stumps that have been treated with herbicides
- Sawdust blocks or pellets that contain synthetic glues or additives
- Treated wood chips (such as for landscaping, with added color)
- Any substrate containing heavy metals
- Harvesting rare trees for mushroom production.
- Transporting logs in violation of any quarantine on forest products (as outlined above under “required”)
- Use of logs that were harvested for mushroom production without consideration for good management practices or forest improvement.

### 3. Spawn

- Allowed

- Pegs, grain, sawdust, plugs
- The use of unprinted cardboard for spawn production
- The use of spawn that is not certified

- Recommended

- Spawn that’s Certified Naturally Grown or Certified Organic

- Prohibited

- Spawn made with genetically modified grain or other GMO feedstock
- Spawn made with materials prohibited for use as substrate

- Glue or other adhesives

#### **4. Sterilizing and Pasteurizing Substrate**

- Allowed
  - Use of drums or other containers that are new, or if used and from another source, can be verified never to have contained toxic materials
  - Use of rubbing alcohol, hydrogen peroxide or diluted bleach solution (a 5% solution of sodium hypochlorite) to sanitize cooling surface
  - Use of burnt wood ash to make a treatment solution
  - Use of non-potable water
  - Cold water fermentation
  - Use of hydrogen peroxide to make a treatment solution, if allowed to stabilize before discarding
  - Use of hydrated lime to make a treatment solution provided that the solution is balanced back to pH7 before disposal
  - Use of calcium hypochlorite for pasteurization
  - Use of yucca extract as a wetting agent
- Prohibited:
  - Use of drums that have contained toxic materials
  - Use of used drums that have had unknown uses
  - Use of containers that may leach during pasteurization or sterilization
  - Use of synthetic wetting agents

#### **5. Substrate Disposal**

- Required
  - Used substrate must be composted, either on-site or elsewhere, and returned to the soil, unless the used substrate can be put to other continued productive use
  - Removal of all tags, inorganic labels, and plastic containers prior to composting
  - Maintain a good neighbor policy. When compost area is close to neighbors, measures should be taken to avoid friction and maintain good relations, such as fungus gnat and fly control and keeping the area neat and tidy.
  - Store composted and composting substrate in a way that it won't leach nutrients into waterways
- Recommended
  - Using composted spent substrate materials for other productive use, such as soil improvement in food production operations
- Allowed
  - Composting of spent substrate materials, without further use
- Prohibited:
  - Discarding spent substrate materials into the solid waste stream (such as curbside pickup in towns, or transfer stations in rural areas)
  - Allowing composted and composting substrate to leach nutrients into waterways

## 6. Pest Control and Disease Management

- Required
  - Use sticky traps or other methods to actively monitor and pro-actively control populations to prevent serious outbreaks
  
- Recommended
  - Use barriers – such as row covers, screens and others – to physically exclude pests from production areas
  - For closed container cropping, begin with minute holes for ventilation during spawn run, to prevent insects from entering, and wait until after full colonization to make larger holes for fruiting.
  - Copper edging to deter slugs
  - Maintain clean production space to minimize breeding grounds or attractants for pests.
  - Remove organic matter from fruiting area
  - Isolate different batches and/or stages of production (for indoor operations).
  - Harvest before gills part to prevent fungus gnats and fruit fly infestations
  - To prevent bacterial contamination, minimize nitrogen supplementation, lower temperature, ensure adequate gas exchange and drainage of growing media.
  - Store supplements and grains in sealed containers to keep from rodents
  
- Allowed
  - Black light insect traps
  - Bti treatment of substrate
  - Use of poultry to control pests, so long as they are not allowed into fruiting area
  - Providing habitat for beneficial predators like frogs, spiders and lizards
  - Bleach to clear mold from substrate (not fruiting bodies)
  - Powdered lime to treat mold
  - Hydrogen peroxide to deter surface growth of competing molds
  - Isopropyl alcohol
  - Compressed air or small vacuum to remove thrips
  - Diatomaceous Earth
  - Sluggo
  
- Prohibited:
  - Synthetic pesticides
  - Poison
  - Blowing on fruiting bodies to eliminate thrips (it's unsanitary)

## 7. Water

Water quality is a critical component of any mushroom operation. CNG requires producers to ensure that all incoming water is as clean and safe as possible. Mushrooms are like sponges; they will readily pick up contaminants and materials from their environment. Testing should occur where there is reasonable concern. Producers must adhere to all local, state, and federal regulations regarding food safety and water used to produce food. Should any of the standards described below appear to contradict local, state, or federal regulations, the

producer should adhere to the regulations and notify CNG of the conflict. Certified Naturally Grown is not a food safety certification program. CNG does not certify food safe production practices.

- Required
  - Well water used to irrigate fruiting bodies must be tested for E. coli once per year, and test results must be negative with no E. coli detected.
  - Surface water used to soak logs and irrigate non-fruiting substrate must be tested at least twice per year for E. coli, including at the beginning of the season and in the middle of the season, and E. coli levels must fall below 235 cfu/100ml.
  - Producer must make inquiries to relevant experts regarding which contaminants are known to be present in the area for their type of water source, including the municipal water supply, and also keep records of inquiries to such experts, including the date the inquiry was made, the name and affiliation of the person contacted, and a list of which contaminants the expert/s noted were commonly found in water from the local area. Relevant experts include: local or state health department officials, Natural Resource Conservation Service agents, state environmental protection or pollution control agencies, local well drilling and water testing companies.
  - Well water, municipal water, and surface water must be tested at point of use for any heavy metals or other contaminants that are known by relevant experts to be common in that area for that type of water source. Test results must fall below levels specified by EPA. (See Appendix I)
  - All required tests must be done in a professional laboratory.
  - Laboratory reports for all water tests must be kept on file and presented at the inspection. They shall indicate what was tested for, the date and place from which the sample was collected, and the test results.
  
- Recommended
  - In addition to annual testing, wells should be tested after any relevant geological activity that may impact groundwater (for example, flooding, drilling, earthquakes or hydraulic fracturing in the region).
  
- Allowed
  - Soaking logs in ponds
  - Use of surface water to irrigate non-fruiting logs
  - Use of home water testing kits for additional tests beyond the required laboratory tests
  - Use of municipal water for irrigation without prior testing when relevant local experts indicate contaminants are not likely for that water source
  
- Prohibited:
  - Using water from a well to mist or irrigate fruiting bodies without first testing to ensure absence of E.coli
  - Using surface water for misting or irrigating fruiting bodies

- Use of water that contains heavy metals or other contaminants at levels that exceed EPA Guidelines

## 8. Energy Use

- Recommended
  - Using on-site sustainable energy sources (solar, wind, geothermal, hydropower, biomass) for air circulation, lighting, and regulating temperature of indoor environments. Or alternatively, sourcing power from an off-site community renewable energy CSA whereby credits from that system are used to offset grower's electricity consumption
  - Use of LED lights for indoor facilities
  - Minimize or eliminate need for artificial climate control
  - Use of water catchment for outdoor log soaking and cultivation
- Allowed
  - Use of electricity sourced from fossil fuel energy

## 9. Containers, Racks and Beds

- Recommended
  - Using durable, re-usable containers instead of disposable ones
  - Racks and beds made of metal or cedar
- Allowed
  - Using re-purposed (used) plastic containers for fruiting, so long as those containers can be verified not to have contained toxic materials
  - Racks and beds made of plastic
  - Treated lumber may be used only for the frames of racks and only if the treated wood will not come into contact with any substrate or fruiting bodies.
  - HDPE (high density polyethylene)
  - MDPE (medium density polyethylene)
  - LDPE (low density polyethylene)
  - Polypropylene
- Prohibited:
  - Containers that were used to hold toxic materials
  - Containers that had an unknown prior use
  - Totes that were previously used for storing chemicals (pesticides, volatile compounds, petroleum products).
  - Plastics that contain BPA (Bisphenol A)
  - Styrofoam containers
  - Treated wood for racks except limited use for framing when the treated wood won't come into contact with any substrate or fruiting bodies.
  - Railroad ties or treated wood for beds

## 10. Other Materials

- Allowed

- Food-grade cheese wax, plant wax, and beeswax for caps on inoculated logs
- Plastic tarps and shade cloth
- Prohibited
  - Polystyrene caps on inoculated logs
  - Vaseline on inoculated logs
  - Paint on inoculated logs
  - Cheesewax made with ethylene-propylene co-polymer or synthetic colors
  - Wax that is perfumed or dyed

## 11. Transition Period

CNG intends to include producers who are committed to adhering to CNG standards and taking steps to increase the sustainability of their operations. In order to be more inclusive without compromising standards, a Transition Period is defined for particular circumstances, as follows.

### *Replacing Non-Compliant Equipment*

Operations in transition must replace their non-compliant equipment by the end of the specified transition period in order to keep their CNG certification in good standing.

- When equipment used for pasteurizing does not meet CNG standards, it must be replaced within two months of the producer's application being accepted, and before their first inspection.
- Fruiting room racks that don't meet CNG standards (eg. made from treated wood) must be replaced within 12 months of the producer's CNG application being accepted and before the producer's second inspection.
- Pressure-treated wood used to elevate logs must be replaced with non-treated wood within two month's of a producer's application being accepted and before the producer's first inspection.

### *Substrate and Production Area*

- When an outdoor production area was treated with prohibited substances within 36 months of harvest, the transition period shall last until 36 months since the last application of a prohibited substance. Substrate must not come into contact with any surface that may have been treated with the prohibited materials.
- There is no transition period for substrates that don't meet CNG standards. Mushrooms produced using such substrate may not be marketed as Certified Naturally Grown.

## 12. Record Keeping

- Required
  - The producer shall maintain records of any water quality tests. They shall indicate what was tested for, the date and place from which the sample was collected, and the test results. Lab results should be kept on file for the inspection.
  - Producer must keep records of inquiries to relevant experts with knowledge of likely contaminants in the local water supply, including the date the inquiry was made, the name and affiliation of the person contacted, and a list of which



contaminants the expert/s noted were commonly found in water from the local area.

- The producer shall maintain records of the different spawn and substrates used, including the source (name of person or vendor), contact information, and known constituents of the substrate, where applicable.
- If producer purchases or otherwise obtains substrate material that's a byproduct of a crop that is commonly produced in GMO form, such as soybean meal or cottonseed hulls, then the producer must obtain a statement or receipt from their supplier that clearly indicates the agricultural crop is non-GMO.
- The producer shall maintain a log of any pest or disease treatments, including date, product used, and reason for treatment.

### **13. Inspections**

Certified Naturally Grown is a Participatory Guarantee System (PGS), where the Inspector provides at least two functions: an opportunity for the producer and Inspector to share knowledge about best practices, and provide an audit to make sure the producer understands the CNG standards and that they are being upheld.

Eligible inspectors include:

- Mushroom producer who is CNG
- Mushroom producer who is certified organic
- Mushroom producer who is not certified but uses natural methods
- As a last resort, the producer may rely on a soil-based produce farmer who is CNG or certified organic only when another mushroom producer isn't nearby, and when the inspector receives prior approval by CNG staff

Exclusions:

- Inspections cannot be 'exchanged' within a 12-month period. For example, if producer A conducts an inspection of producer B's operation, then producer B cannot conduct an inspection of producer A's operation that year. Producer A must find another eligible inspector.
- Individuals with familial ties to the producer are not eligible to serve as their inspector.
- Individuals who are employees or interns of the producer are not eligible to serve as their inspector.

Frequency:

- Inspections are required once annually (with a 4-month grace period)

Work Requirement:

- CNG producers are expected to conduct at least one inspection for another CNG producer annually, if there is one who needs an inspection within a 60-minute drive. If there is no CNG producer within a 60-minute drive, or no producer who requires an inspection, then the work requirement is waived until there is a CNG producer within a 60-minute drive who needs an inspection.

## APPENDIX A

EPA Limits for Constituents in Reclaimed Water for Irrigation – Long Term Use	
	Mg/L
Aluminum	5
Arsenic	0.1
Barium	0.1
Boron	0.75
Cadmium	0.01
Chromium	0.1
Cobalt	0.05
Copper	0.2
Fluoride	1
Iron	5
Lead	5
Lithium	2.5
Manganese	0.2
Molybdenum	0.01
Nickel	0.01
Selenium	0.02
Vanadium	0.1
Zinc	2