AAPFCO
Product Label Guide



Association of American Plant Food Control Officials

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3 INTRODUCTION

Association of American Plant Food Control Officials (AAPFCO) is an organization of fertilizer control officials from each state in the United States, from Canada and from Puerto Rico who are actively engaged in the administration of fertilizer laws and regulations; and, research workers employed by these governments who are engaged in any investigation concerning mixed fertilizers, fertilizer materials, their effect, and/or their component parts.

The Association works to create guidance for members and industry by developing standards through consensus. Although individual states may choose not to adopt AAPFCO guidance in full, or may adopt additional standards, the guidance in this, and other AAPFCO documents, can be considered as a minimum standard for all products and the official policy of the Association.

This AAPFCO Label Guide is a summary of the label standards contained in the AAPFCO Official Publication No. 79 (2016). Although this guide describes AAPFCO label standards, the laws of each state are the final standard for labeling, licensing, and registration requirements. The AAPFCO Official Publication is available for purchase at www.aapfco.org.

4 LABEL DEFINED

The term **label** is all of the written, printed, or graphic matter on the immediate container, or a statement accompanying a fertilizer. [AAPFCO Uniform State Fertilizer Bill, Section 4(n)]

Each product container must have a label that is clearly legible and conspicuous, and that provides the basic information, as described in the following document, for the product.

For bulk shipments, the label will be a separate document accompanying the delivery and supplied to the purchaser at the time of delivery.

The term **labeling** means any advertising, promotional, or promotion of any fertilizer including but not limited to all written, printed, graphic, or electronic communication used in promoting the sale of such fertilizer. [AAPFCO Uniform State Fertilizer Bill, Section 4(o)]

5 FERTILIZERS

Fertilizer - A fertilizer is a substance containing one or more recognized plant nutrients, and used for its plant nutrient content. [AAPFCO Uniform State Fertilizer Bill, Section 4(a)]

5.1 GENERAL REQUIREMENTS

All fertilizers, including specialty fertilizers, must be registered and/or licensed before being distributed in the State. [AAPFCO Uniform State Fertilizer Bill Section 5]

5.2 TYPES OF FERTILIZERS

Fertilizer Material - A fertilizer that contains important quantities of only one primary nutrient (total nitrogen, available phosphate, or soluble potash), or has 85% or more of its plant nutrient content as a single chemical compound, or is derived from plant or animal residue or by-product, or a natural material deposit that has not had its nutrient content materially altered by processing. [AAPFCO Uniform State Fertilizer Bill, Section 4(a)(1)]

Mixed Fertilizer - A mixed fertilizer is a fertilizer containing a mixture of fertilizer materials (ingredients). [AAPFCO Uniform State Fertilizer Bill, Section 4(a)(2)]

Specialty Fertilizer - A fertilizer distributed for non-farm use, such as a lawn fertilizer. [AAPFCO Uniform State Fertilizer Bill, Section 4(a)(3)]

Bulk Fertilizer - A fertilizer distributed in a non-packaged form, such as; truckload shipments. [AAPFCO Uniform State Fertilizer Bill, Section 4(a)(4)]

Synthetic Fertilizer - Any fertilizer manufactured from one or more synthetic materials containing no animal parts, animal byproducts, manures, or renderings. (AAPFCO Official Terms, T-61)

Organic Fertilizer - A material containing carbon and one or more elements other than hydrogen and oxygen essential for plant growth. (AAPFCO Official Terms, T-12)

Natural Fertilizer - A substance composed only of natural organic and/or natural inorganic fertilizer materials and natural fillers. (AAPFCO Official Terms, T-36)

Natural Organic Fertilizer - Materials derived from either plant or animal products containing one or more elements (other than carbon, hydrogen, and oxygen) which are essential for plant growth. These materials may be subjected to biological degradation processes under normal conditions of aging, rainfall, sun-curing, air drying, composting, rotting, enzymatic, or anaerobic/aerobic bacterial action, or any combination of these.
These materials shall not be mixed with synthetic materials or changed in any physical or chemical manner from their initial state except by manipulations such as drying, cooking, chopping, grinding, shredding, hydrolysis, or pelleting. (AAPFCO Official Terms, T-13)

Natural Inorganic Fertilizer - A mineral nutrient source that exists in or is produced by nature and may be altered from its original state only by physical manipulation. (AAPFCO Official Terms, T-35)

Natural Base Fertilizer - A mixed fertilizer where more than half of the fertilizer materials is natural and where more than half of the sum of the guaranteed primary nutrient percentages is derived from natural materials. (AAPFCO Official Terms, T-38)

Organic Base Fertilizer - A mixed fertilizer where more than half of the fertilizer materials is organic and where more than one half of the sum of the guaranteed primary nutrient percentages is derived from organic materials. (AAPFCO Official Terms, T-39)

5.3 BASIC LABEL COMPONENTS

All fertilizer labels must have five basic elements: brand and grade, guaranteed analysis, directions for use, name and address of registrant, and net weight. [AAPFCO Uniform State Fertilizer Bill, Section 6]

For bulk shipments, this information must accompany the delivery as a written or printed form and shall be supplied to the purchaser at the time of delivery. [Uniform State Fertilizer Bill, Section 6(a)]

A fertilizer formulated according to specifications which are furnished by or for a consumer prior to mixing (custom blend) shall be labeled to show the net weight, the guaranteed analysis, and the name and address of the distributor or registrant/licensee. [Uniform State Fertilizer Bill, Section 6(b)]

A fertilizer formulated according to specifications which are furnished by or for an end user prior to mixing and intended to be applied using variable rate technology shall be accompanied by a plainly written statement which shows the guaranteed analysis and net weight of each material used in the formulation, the name and address of the distributor or registrant/licensee and the end user, and the global positioning system (GPS) coordinates of the field location on which the material was applied. [Uniform State Fertilizer Bill, Section 6(c)]

5.3.1 Brand

The brand is a term, design or trademark used in connection with one or several grades of fertilizer. The brand must not be misleading. Any numerals used in the brand must not be misleading. [AAPFCO Uniform State Fertilizer Bill, Section 4(b)] An example of an acceptable brand would be "SuperGro Supreme." (Figure 1)

5.3.2 Grade

The grade is the percentage of Total Nitrogen (N), Available Phosphate (P_2O_5) and Soluble Potash (K_2O) in the same terms, order, and percentages as in the guaranteed analysis. The grade should not include any nutrients other than Total Nitrogen, Available Phosphate, and Soluble Potash. [AAPFCO Uniform State Fertilizer Bill, Section 4(d) and Statements of Uniform Interpretation and Policy (1)]

The grade statement for mixed fertilizers must be in whole numbers, such as 10-20-10. [AAPFCO Uniform State Fertilizer Bill, Section 4(d)]

The grade statement for specialty fertilizers may be guaranteed in fractional units of less than one percent of Total Nitrogen (N), Available Phosphate (P_2O_5), and Soluble Potash (K_2O). [AAPFCO Uniform State Fertilizer Bill, Section 4(d)]

The grade statement for fertilizer materials such as bone meal, manure, or ammonium nitrate may also be guaranteed in fractional units. [AAPFCO Uniform State Fertilizer Bill, Section 4(d)]

5.3.3 Guaranteed Analysis

The Guaranteed Analysis is the manufacturer's guarantee for minimum percentage of nutrients claimed for the product. [AAPFCO Uniform State Fertilizer Bill, Section 4(c)] In a Guaranteed Analysis the nutrients are listed in a specific order and format. [AAPFCO Rules and Regulations-Fertilizer 1] For more information, see the section titled, “Guaranteed Analysis Basics”.

5.3.4 Directions for Use

Any fertilizer delivered to an end user shall include directions for use. The minimum directions must include either a general statement, such as “Use in accordance with the recommendations of a qualified individual or institution or according to an approved nutrient management plan,” or provide detailed directions for use. [AAPFCO Rules and Regulations-Fertilizer 2(h)]

5.3.5 Name and Address of Registrant

The name and address of the person or company responsible for the guarantees on the label must be listed on the label. [AAPFCO Uniform State Fertilizer Bill, Section 5(a)(3)]

5.3.6 Net Weight

All fertilizer labels (bag, bulk or liquid) must include a statement of net weight. [AAPFCO Rules and Regulations-Fertilizer 2(a)] As all guarantees for plant nutrients are made as a percentage of weight, all products must be labeled and sold by net weight stated in U.S. and Metric Units.

5.3.7 Derivation Statement

The derivation statement lists the sources for the nutrients in the guaranteed analysis. This statement is not required by the AAPFCO Uniform State Fertilizer Bill, but when it is provided, it must be listed below the guaranteed analysis. [AAPFCO Rules and Regulations-Fertilizer 2(e)]

Figure 1 – Basic Elements of a Fertilizer Label

SuperGro Supreme
12-4-9
GUARANTEED ANALYSIS

Total Nitrogen (N) 12%
Available Phosphate (P_2O_5) 4%
Soluble Potash (K_2O) 9%
Calcium (Ca) ..... x%
Magnesium (Mg) ..... x%
Sulfur (S) ..... x%
Boron (B) ..... x%
Chlorine (Cl) ..... x%
Cobalt (Co) ..... x%
Copper (Cu) ..... x%
Iron (Fe) ..... x%
Manganese (Mn) ..... x%
Molybdenum (Mo) ..... x%
Nickel (Ni) ..... x%
Sodium (Na) ..... x%
Zinc (Zn) ..... x%

Derived from: Ammonium Sulfate, Triple Super Phosphate, Sulfate of Potash Magnesia, Potassium Chloride, Calcium Sulfate, Boric Acid, Cobalt Sulfate, Copper Oxide, Iron Oxide, Manganese Sulfate, Sodium Molybdate, Nickel Oxide, and Zinc Oxide.

Directions for use: XXXX

Farm Co-op
Hwy 1, Box 7
Centerville, Any State Zip Code

Net Weight – 25 lb (11.33 kg)

5.4 GUARANTEED ANALYSIS BASICS

The Guaranteed Analysis is the guarantee of the minimum percentage of nutrients claimed for the product. These claims must be made in a specific order and format, as shown in Figure 1.

Any primary nutrients claimed must be reported as Total Nitrogen (N), Available Phosphate (P_2O_5), and Soluble Potash (K_2O), in that order. [AAPFCO Uniform State Fertilizer Bill, Section 4(c)(1)]

The guarantees for all other nutrients must be made on an elemental basis and in the order shown in Example Figure 1. [AAPFCO Rules and Regulations-Fertilizer 1]

Zero (0) guarantees should not be made and shall not appear in guaranteed analysis statement, except in nutrient guarantee breakdowns. [AAPFCO Rules and Regulations-Fertilizer 2(d)] (See page 6)

The term of "percentage" by symbol or word, when used on a fertilizer label shall represent only the amount of individual plant nutrients in relation to the total product by weight. [AAPFCO Uniform State Fertilizer Bill, Section 4(h), Rules and Regulations-Fertilizer 5] For example, the statement a product "contains 50% slowly available nitrogen" would mean the product would have a grade statement of at least 50-0-0, and a 50 lb bag would contain 25 lbs. of slowly available nitrogen.

5.5 NITROGEN GUARANTEES

In the guaranteed analysis, nitrogen must be guaranteed as Total Nitrogen (N).

If chemical forms of nitrogen are claimed or required, then, as shown below, the forms must be shown in the Guaranteed Analysis. No particular order of forms of nitrogen is required. [AAPFCO Rules and Regulations-Fertilizer 2(d)]

GUARANTEED ANALYSIS

Total Nitrogen (N) x%
- x% Ammoniacal Nitrogen
- x% Nitrate Nitrogen
- x% Water Insoluble Nitrogen
- x% Urea Nitrogen
- x% (Other recognized and determinable forms of nitrogen)

5.5.1 Forms of Nitrogen

Ammoniacal Nitrogen (NH_4^+) is one of only two forms of nitrogen taken up by plants. Sources include but are not limited to monoammonium phosphate (MAP), diammonium phosphate (DAP), ammonium sulfate, ammonium nitrate, urea ammonium nitrate (UAN), ammonium polyphosphate, calcium ammonium nitrate (CAN), and ammonium thiosulfate.

Nitrate Nitrogen (NO_3^-) is one of only two forms of nitrogen taken up by plants. Sources include but are not limited to UAN, ammonium nitrate (NH4NO3), and potassium nitrate (KNO3).

Urea Nitrogen [$CO(NH_2)_2$] can come from sources that include, but are not limited to, UAN, urea, urea triazone, sulfur coated urea, and polymer coated urea.

Other Water Soluble Nitrogen can come from sources that include, but are not limited to, methylene urea, urea triazone, methylene diurea (MDU), dimethylenetriurea (DMTU), triazone, ureaform, and urea-formaldehyde.

Slowly Available Water Soluble Nitrogen can come from sources that include, but are not limited to, methylene urea, urea triazone, methylene diurea (MDU), dimethylenetriurea (DMTU), triazone, ureaform, and urea- formaldehyde. (AAPFCO Statement of Uniform Interpretation of Policy 21)

Water Insoluble Nitrogen (WIN) can come from sources that include, but are not limited to, ureaform, isobutylidene diurea, urea-formaldehyde, feather meal, blood meal, corn gluten meal, and other natural organic materials.

SLOW FERTILIZER 20-0-0
Guaranteed Analysis
Total Nitrogen (N)..... 20%
8% Urea Nitrogen
2% Other Water Soluble Nitrogen
2.9% Slowly Available Water Soluble Nitrogen*
7.1% Water Insoluble Nitrogen

*Slowly available nitrogen from: XXXX (list source).

5.6 Available Phosphate Guarantees

Available Phosphate (P_2O_5) is the sum of the water soluble and the citrate soluble phosphate in a product. (AAPFCO Official Fertilizer Definition P-2) This is also the amount of pentavalent phosphorus P^{+5} present in the material. [Uniform State Fertilizer Bill, Section 4(c)(2) and AAPFCO Official Fertilizer Definition P-1]

Sources of available phosphate include but are not limited to: diammonium phosphate (DAP), monoammonium phosphate (MAP), triple superphosphate, (TSP), monopotassium phosphate, rock phosphate, and bone meal.

5.6.1 Definitions

No Phosphate Fertilizer means fertilizer products with phosphate levels below 0.5% intended for established urban turf or lawns. (AAPFCO Official Terms T-76)

Low Phosphate Fertilizer means products intended for new or established urban turf or lawns, with available phosphate levels equal to or above 0.5% P_2O_5 and an application rate not to exceed 0.25 lb. P_2O_5/1000 sq. ft./application and 0.5 lb P_2O_5/1000 sq. ft./year. (AAPFCO Official Terms T-77)

5.7 Soluble Potash Guarantees

Soluble Potash (K_2O) is the portion of the potash soluble in aqueous ammonium oxalate, aqueous ammonium citrate or water. (AAPFCO Official Fertilizer Definitions K-2)

Sources of soluble potash include but are not limited to: sulfate of potash, muriate of potash, potassium sulfate, kelp, and sulfate of potash-magnesia.

5.8 SECONDARY NUTRIENT AND MICRONUTRIENT GUARANTEES

All fertilizer nutrients, with the exception of phosphate (P_2O_5) and potash (K_2O), if guaranteed, shall be stated in terms of the elements. [AAPFCO Rules and Regulations-Fertilizer 1 and AAPFCO Statements of Uniform Interpretation and Policy 2]

Nutrients, other than primary nutrients, that are essential to the normal growth of plants may need to be added to the growth medium. Secondary plant nutrients include calcium, magnesium, and sulfur; micronutrients include boron, chlorine, cobalt, copper, iron, manganese, molybdenum, nickel, sodium, and zinc. (AAPFCO Official Terms T-9)

Except for those water soluble nutrients labeled for ready to use foliar fertilizers, ready to use specialty liquid fertilizers, hydroponic or continuous liquid feed programs and guarantees for potting, garden, and lawn soils, the minimum percentages of secondary nutrients and micronutrients accepted for registration are as follows:

Calcium (Ca).....1.0000%
Magnesium (Mg).....0.5000%
Sulfur (S) 1.0000%
Boron (B).....0.0200%
Chlorine (Cl) 0.1000%
Cobalt (Co).....0.0005%
Copper (Cu).....0.0500%
Iron (Fe) 0.1000%
Manganese (Mn) 0.0500%
Molybdenum (Mo) 0.0005%
Nickel (Ni) 0.0010%
Sodium (Na).....0.1000%
**Soluble Silicon (Si)……0.0100%*
Zinc (Zn) 0.0500%

Guarantees or claims for the above listed plant nutrients are the only ones which will be accepted. Guarantees for any of the above listed elements shall appear in the order listed, immediately following guarantees for primary nutrients of Total Nitrogen (N), Available Phosphate (P_2O_5), and Soluble Potash (K_2O). [AAPFCO Rules and Regulations-Fertilizer 1]

5.8.1 Chelated and Complexed Plant Nutrient Guarantees

When plant nutrients are chelated or complexed the chelating or complexing agent shall be listed in the derived from statement and guaranteed as follows:

GUARANTEED ANALYSIS

Copper (Cu) 10%
8% Water Soluble Copper
Iron (Fe)..... 10%
10% Chelated Iron
Derived from: Copper Amino Acid Complex and Iron EDTA

5.8.2 Warning and Caution Statements

Warning or caution statements may be required for some water soluble forms of micronutrients, such as boron or molybdenum, when present in excess of a state-defined level. [AAPFCO Rules and Regulations- Fertilizer 1 (a)- (e)] (Refer to Appendix A) Example of a warning statement is included in Figure 2. Substitutions may be made in the Caution or Warning statements for nutrient hazards. Acceptable substitutions would include Attention, Notice, or any other term/phrase deemed appropriate by the department and not in conflict with other federal or state labeling laws.

5.8.3 Chlorine

The chlorine content of mixed fertilizers in which the potash is claimed in a form other than chloride shall not exceed one-half of one percent (0.5%) more than five percent (5%) of the potash content found (Calculate as follows: 0.05 times the percentage of potash found plus 0.5). (AAPFCO Statements of Uniform Interpretation and Policy 10)

5.9 Slowly Available Nutrient Guarantees

When a fertilizer contains recognized and determinable forms of nutrients with slowly available properties, including coated or occluded materials and a slowly available claim is made; then the guarantee should be shown as a footnote, rather than as a component in the guaranteed analysis. [AAPFCO Rules and Regulations- Fertilizer 3] (AAPFCO Statements of Uniform Interpretation and Policy 17)

5.9.1 Guarantee for One Slowly Available Nutrient

GUARANTEED ANALYSIS

Total Nitrogen (N)..... x%
- x% Nitrate Nitrogen
- x% Urea Nitrogen*
- x% Ammoniacal Nitrogen

*x% Slowly available urea nitrogen from _____ (list source material).

5.9.2 Guarantee for All Materials of One Nutrient Slowly Available

GUARANTEED ANALYSIS

Total Nitrogen (N)*..... x%
- x% Ammoniacal Nitrogen
- x% Urea Nitrogen
- x% Nitrate Nitrogen

*x% Slowly available nitrogen from _____ (list source material).

5.9.3 Guarantee for Two Slowly Available Materials

GUARANTEED ANALYSIS

Total Nitrogen (N)..... x%
x% Ammoniacal Nitrogen
x% Nitrate Nitrogen
x% Urea Nitrogen*
Available Phosphate (P_2O_5)** ..... x%

*x% Slowly available urea nitrogen from _____ (list source material).
**x% Slowly available phosphate from _____ (list source material).

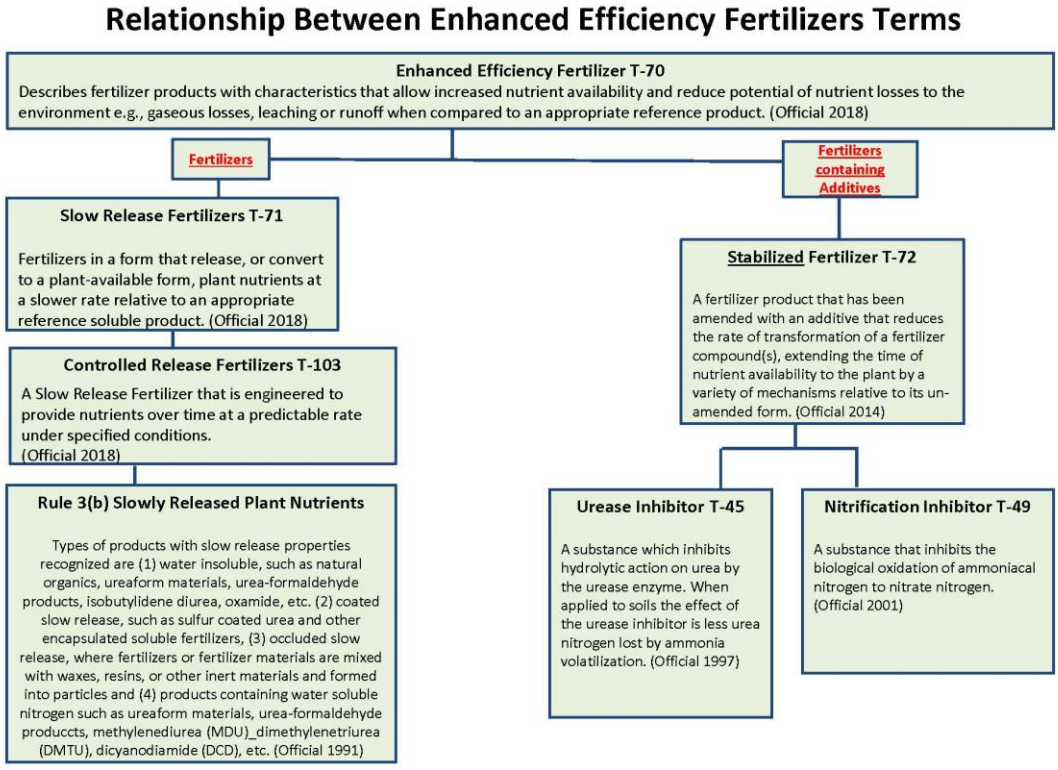
5.9.4 Guarantee for Two Coated Materials

GUARANTEED ANALYSIS

Total Nitrogen (N)*..... x%
x% Ammoniacal Nitrogen
x% Nitrate Nitrogen
x% Urea Nitrogen
Available Phosphate (P_2O_5)* ..... x%

*The nitrogen and phosphate in this product have been coated to provide x% coated slow release nitrogen (N) and x% coated slow release available phosphate (P_2O_5).

Figure 2 – Enhanced Efficiency Fertilizer Terms



5.10 Other Label Requirements

5.10.1 Specialty Fertilizers

Specialty fertilizers are products intended for non-farm use. Any product coming under the fertilizer law shall not carry labels to emphasize that dilutions will make so many gallons of fertilizer. Specific claims, such as "contents of this package will make _ gallons of fertilizer" should be prohibited. The labels shall not carry any extravagant and misleading advertising and claims. (AAPFCO SUIP 9)

Specialty fertilizer labels must include directions for use, including recommended application rates, application timing and minimum intervals, and the statement "Apply Only as Directed," or similar statement. [AAPFCO Rules and Regulations-Fertilizer 2(h)(1)]

5.10.2 Beneficial Substances

Note: For the most up-to-date beneficial substance and plant biostimulant information, please refer to section 9

Beneficial substances are any substance or compound other than primary, secondary, and micro plant nutrients, and excluding pesticides, that can be demonstrated by scientific research to be beneficial to one or more species of plants, soil, or media. (AAPFCO Official Terms T-73)

A **plant biostimulant** is a substance(s), microorganism(s), or mixtures thereof, that, when applied to seeds, plants, the rhizosphere, soil or other growth media, act to support a plant's natural nutrition processes independently of the biostimulant's nutrient content. The plant biostimulant thereby improves nutrient availability, uptake, or use efficiency, tolerance to abiotic stress, and consequent growth, development, quality or yield. (AAPFCO Uniform Beneficial Substances Bill, currently tentative)

When claimed or advertised, beneficial substances must be guaranteed on the product label. When included in a fertilizer product (contains plant nutrients) this guarantee shall appear under the heading "ALSO CONTAINS BENEFICIAL SUBSTANCES." [AAPFCO State Fertilizer Bill, Rules and Regulations, Fertilizer Labels 2(f)]

5.10.2.1 Guarantee for Beneficial Substances

ALSO CONTAINS BENEFICIAL SUBSTANCE(S)
Name of beneficial substance __% (or acceptable units)
Genus and species of microorganism __ viable CFU/cm^3, /mL, /g, or other acceptable units

(Identify and list all beneficial substances. Substances shall include ingredient source, if applicable. Ex. "humic acid from leonardite or saponin from Yucca schidigera")
For products that claim microorganisms, labels shall also include: the expiration date for use and storage conditions.

The amount of beneficial substance is generally guaranteed by the weight of the substance or compound as a percentage of the net weight of the product. When more appropriate; certain substances or compounds may be guaranteed in other, more applicable units.

5.10.3 Labeling of Organic Input Products

Products intended for use as organic inputs may make statements on the product's label that affirm that the product is in accord with the National Organics Program (NOP) (e.g. "suitable for organic farming", "acceptable for use in organic production", or "meets National Organic Program requirements for organic production") and may use the logos issued by the recognized agencies such as Organic Materials Review Institute (OMRI), certifying agencies, state programs, or other recognized organic input listing services. Such statements are exempt from requirements pertaining to organic labeling under the fertilizer law. (AAPFCO SUIP 28)

Organic Fertilizers whose label or labeling includes statements regarding the presence of organic matter and claims consistent with established agronomic benefits that organic matter imparts on soils need not be dual- registered as a soil amendment provided that the product is registered as a fertilizer. (AAPFCO Statements of Uniform Interpretation and Policy 29)

Organic Nitrogen can be used, when appropriate, to describe a portion of the nitrogen in the nitrogen breakdown. However, if an amount of nitrogen is designated as organic then the water insoluble nitrogen or the slow release nitrogen guarantee must not be less than 60% of the nitrogen so designated. Coated urea shall not be included in meeting the 60% requirement. [AAPFCO Rules and Regulations-Fertilizer 9]

5.11 Labeling and Misbranding

In essence, "labeling" means any advertising, promotional, or promotion of any fertilizer including but not limited to all written, printed, graphic, or electronic communication used in promoting the sale of such fertilizer. [AAPFCO Uniform State Fertilizer Bill, Section 4(o)] It can be attached to the product, accompany the product, or be entirely separate from the product.

A fertilizer shall be deemed misbranded if:

- its labeling is false or misleading
- it is distributed under the name of another fertilizer product
- it is not labeled as required and in accordance with regulations
- any plant nutrient or fertilizer claimed or guaranteed does not conform to the definition of identity, if any, prescribed by regulation of the state; in adopting such regulations the state shall give due regard to commonly accepted definitions and official fertilizer terms such as those issued by AAPFCO.

No person shall distribute a misbranded fertilizer product. [AAPFCO Uniform State Fertilizer Bill Section 12]

Additional Notes — The Federal Trade Commission (FTC) requires that any claims made in product advertising must:

- be truthful and non-deceptive, and
- have evidence to back up any claims, prior to making the claim. The simple rule to avoid misbranding:

IF YOU CLAIM IT, YOU MUST GUARANTEE IT.

5.12 Adulteration

A fertilizer is adulterated if:

- it contains any harmful or deleterious substance in sufficient amounts to render it injurious to beneficial plant life, humans, aquatic life, soil or water when applied as directed;
- adequate warning statements and directions for use which are necessary for safe use are not shown on the label;
- its composition is less than purported; or
- it contains unwanted crop or weed seed

No person shall distribute an adulterated fertilizer. [Uniform State Fertilizer Bill Section 13]

Figure 3 – A Fertilizer Label with Beneficial Substances

SuperGro
Super Supreme
12-4-9

GUARANTEED ANALYSIS

Total Nitrogen (N) 12%
4% Other Water Soluble Nitrogen
8% Water Insoluble Nitrogen
Available Phosphate (P_2O_5)*.....4%
Soluble Potash (K_2O) 9%
Calcium (Ca) 1%
Magnesium (Mg)..... 0.5%
0.5% Water Soluble Magnesium
Sulfur (S).....1%
1% Combined Sulfur
Boron (B)..... 0.02%
Chlorine (Cl) 0.1%
Cobalt (Co) 0.0005%
Copper (Cu)..... 0.05%
Iron (Fe)..... 0.1%
Manganese (Mn)..... 0.05%
Molybdenum (Mo).....0.0005%
Nickel (Ni).....0.001%
Sodium (Na) 0.1%
Zinc (Zn) 0.05%

Derived from: XXXX
*2% Slowly available phosphate from bone meal.

ALSO CONTAINS BENEFICIAL SUBSTANCES

Humic Acids (derived from leonardite).....6%

Purpose statement: XXXX

Directions for use: XXXX

ATTENTION: This fertilizer carries added Boron and is intended for use only on directed crops. Its use on other crops or under conditions other than those recommended may result in serious crop injury.

Farm Co-op
Hwy 1, Box 7
Centerville, Any State
Zip Code

Net Weight – 25 lb (11.33 kg)

6 BULK COMPOST

Rules and Regulations for bulk (unpackaged) compost are in addition to the Uniform State Fertilizer Bill. States are encouraged to add the Rules and Regulations for Bulk Compost to their State Fertilizer Bill. If added, these Rules and Regulations should be inserted after AAPFCO Uniform State Fertilizer Bill, Rules and Regulations – Fertilizer 2(i).

Bulk compost claiming to contain nutrients must be registered as fertilizers.

Packaged composts are regulated under the Uniform Soil Amendment Bill.

Compost registered as a fertilizer is exempt from registration under the Soil Amendment Bill.

6.1 DEFINITIONS

Annual Production means the quantity of compost produced by a composting facility. [AAPFCO Rules and Regulations–Bulk Compost 1(a)]

Batch means a specified volume or quantity of compost. The term "batch" may mean:

1. The volume of a windrow or stockpile, or
2. The compost produced within a certain period of time, determined by the testing frequency. This frequency is determined by the production volume of the facility.
    a. For facilities with an annual production of 1-6,250 tons of compost, testing frequency must be no less than once per quarter.
    b. For facilities with an annual production of 6,251-17,500 tons of compost, testing frequency must be no less than once per two (2) months.
    c. For facilities with an annual production of more than 17,501 tons of compost, testing frequency must be at least once per month.

[AAPFCO Rules and Regulations–Bulk Compost, Section 1(b)]

Bulk compost is unpackaged compost. [AAPFCO Rules and Regulations–Bulk Compost 1(c)]

Compost is a biologically stable material derived from the composting process. [AAPFCO Rules and Regulations– Bulk Compost 1(d)]

Composting is the biological decomposition of organic matter by mixing and piling in such a way to promote aerobic and/or anaerobic decay. The process inhibits pathogens, viable weed seeds and odors. [AAPFCO Rules and Regulations–Bulk Compost 1(e)]

Feedstock is source material used to produce a compost. [AAPFCO Rules and Regulations–Bulk Compost 1(f)]

Lot means an identifiable quantity of compost that can be sampled officially up to and including a freight car load or 50 tons maximum, or that amount contained in a single vehicle, or that amount delivered under a single invoice. [AAPFCO Rules and Regulations–Bulk Compost 1(g)]

Quantity Statement means net weight or net volume. [AAPFCO Rules and Regulations–Bulk Compost 1(h)]

6.2 LABEL REQUIREMENTS

When a bulk compost product is registered under the Uniform State Fertilizer Bill the product label must include:

- net weight
- a list of the feedstocks used to make the product,
- nutrient guarantees, and
- a list of the sources of the nutrients.

6.2.1 Net Weight

The label of a bulk compost must include a statement of the net weight. Quantity statements based on volume may be used only if:
A weight conversion is provided elsewhere on the product label (e.g., 2 cubic yards = 1 ton); or
A weight scale ticket accompanies delivery and is supplied to the purchaser at time of delivery. [AAPFCO Rules and Regulations–Bulk Compost 2]

6.2.2 List of Feedstocks

The label must contain a list of feedstock from which the compost was derived. [AAPFCO Rules and Regulations–Bulk Compost 5]

6.2.3 Nutrient Guarantees

Bulk compost registered as a fertilizer must include nutrient guarantees. These guarantees must be made on a wet ("as is") basis. However, for compost stored in environmental conditions that may result in variable moisture content in the compost, guarantees may be determined and guaranteed at a specific moisture level, provided that the moisture value shall be stated on the label. Provided that the _____ (lab) determines the moisture level to be in excess of the stated value, the nutrient guarantees shall be adjusted accordingly.

Each batch of bulk compost may be tested for nutrient content and such test results may constitute a guarantee:

1. Except that Total Phosphate (P_2O5) may be guaranteed in addition to Available Phosphate (P_2O_5) and Total Potash (K_2O) may be guaranteed in addition to Soluble Potash (K_2O);
2. And such test results shall accompany each batch of bulk compost.

Guarantees for Total Nitrogen (N), Available Phosphate (P_2O_5), Total Phosphate (P_2O_5), Soluble Potash (K_2O) and Total Potash (K_2O) may be guaranteed in fractional units of less than one percent, regardless of whether the compost is sold as a specialty or agricultural fertilizer. [AAPFCO Rules and Regulations–Bulk Compost 4]

6.2.4 Sources of Nutrients

When shown on the label, the sources of nutrients shall be listed below the completed guaranteed analysis statement. The statement shall include any additional sources of nutrients that have been added to the compost. [AAPFCO Rules and Regulations–Bulk Compost 6]

6.3 PRODUCT CLAIMS

Compost labels and labeling may state the product is intended solely for use of one or more of the following purposes without registration as a fertilizer:

- Improves soil structure and porosity – creating a better plant root environment;
- Increase moisture infiltration and permeability, and reduces bulk density of heavy soils – improving moisture infiltration rates and reducing erosion and runoff;
- Improves the moisture holding capacity of light soils – reducing water loss and nutrient leaching, and improving moisture retention;
- Improves the cation exchange capacity (CEC) of soils;
- Supplies organic matter;
- Aids the proliferation of soil microorganisms;
- Supplies beneficial microorganisms to soils and growing media;
- Encourages vigorous root growth;
- Allows plants to more effectively utilize nutrients, while reducing nutrient loss by leaching;
- Enables soils to retain nutrients longer;
- Contains humus – assisting in soil aggregation and making nutrients more available for plant uptake;
- Buffers soil pH.

[AAPFCO Rules and Regulations–Bulk Compost 3]

Figure 4 – Basic Elements of a Bulk Compost Label

Grower's Bulk Compost
0.2-0.2-0.3

GUARANTEED ANALYSIS

Total Nitrogen (N)	0.2%
Available Phosphate (P_2O_5)	0.2%
Total Phosphate (P_2O_5)	0.6%
Soluble Potash (K_2O)	0.3%
Total Potash (K_2O)	0.5%

Nutrients from composted poultry litter, wheat straw, and sulfate of potash.

Compost feedstock of poultry litter and wheat straw.

This product improves soil structure and porosity and aids the proliferation of soil microorganisms.

Farm Co-op
Hwy 1, Box 7
Centerville, Any State Zip Code

Net Weight – 5 ton or See bulk scale ticket

7 HORTICULTURAL GROWING MEDIA

Rules and Regulations for horticultural growing media (HGM) are an addition to the Uniform State Fertilizer Bill. States may choose to add the Rules and Regulations for HGM to their State Fertilizer Bill. If added, these Rules and Regulations should be inserted after AAPFCO Uniform State Fertilizer Bill, Rules and Regulations.

Horticultural Growing Media products claiming to contain nutrients may need registered as fertilizers.

7.1 DEFINITIONS

Aged means exposed to weathering and/or natural decay.

Brand or **Product Name** is a specific designation applied to an individual horticultural growing medium.

Horticultural Growing Media means any substance or mixture of substances which it promoted as or is intended to function as a commercial or consumer growing medium for the managed growth of horticultural crops in containers.

Processed means deliberately treated or manipulated to modify or transform physical, chemical or biological characteristics of the natural state of the substance.

Raw means in the natural state, and not prepared, modified or manipulated for use.

Registration Document is the information required by the _____ for registering a horticultural growing medium for distribution into or with (State). The Registration Document may be made available by the registrant to the purchaser upon request, but shall not be part of the product label or labeling.

7.2 LABEL REQUIREMENTS

A horticultural growing media product label must include:

- The brand or product name as registered.
- The volume of the product in quarts, cubic feet, yards, and metric volumes, or the weight of the product in ounces, pounds, and metric weights, as registered.
- A list of all physical components, whether organic or inorganic, must be listed in order of decreasing amount by volume if they comprise at least 3% or more of total volume of the product.
- Intended use statements such as general recommendations for product use. If cautionary warnings or uses not recommended are made, they should be stated in this section of the label.
- General fertilization recommendations for use with the product. An acceptable minimum recommendation would indicate at what time after planting the product required the addition of fertilizer, whether the product required the addition of fertilizer, or recognize product as not being a fertilizer and contains minimum nutrients to sustain initial plant growth.
- An address where further product information may be obtained and a telephone number available during normal business hours for further product information.
- For products intended for use by commercial growers, the date of manufacture, or the month and year of manufacture, stated at any location on the bag. If the date or month and year of manufacture is coded, sufficient information must be provided to determine the date or month and year of manufacture from the code.

7.3 Description of the Physical Components

Bark Products shall be described as raw, aged, processed, or composted. Bark should also be specified as pine or softwood or hardwood, and may include no more than 15% wood by volume.

Peat Products shall be described in accordance with ASTM standards as to whether they are sphagnum, hypnum, reed-sedge, humus, or other peat.

Wood Products shall be described as raw, aged, processed, or composted.

Readily degradable organic substances shall be listed and described as raw, aged, processed or composted. The **base material(s)** for any other composted product shall be described or listed.

7.4 Exemptions

- HGM planted with live plant material
- Custom media prepared for a single end user
- HGM containing less than 3% plant nutrients

7.5 HGM Verification of Label Claims Document

The first time a product is registered, a verification of label claims document must be provided by the registrant for each named horticulture growing medium. This document is to be submitted along with the registration.

Subsequent registrations of the same approved medium do not require the re-submission of the label claim verification document. The purpose of the document is to show, in a practical as opposed to a theoretical way, the verification of label claims.

Figure 5 – Basic Elements of a Horticultural Growing Media Label

SuperGo
Horticultural Growing Media
All-Purpose Potting Soil

Components: 45-55% sphagnum peat moss, processed forest products, coco coir, perlite, earthworm castings and limestone.

Directions for use: Place soil in pots or containers. Plant seeds or live plants at recommended depth. Add supplemental fertilizer as needed. Refer to plant tag or seed packet for further directions.

October 2020

Farm Co-op
Hwy 1, Box 7
Centerville, Any State
Phone Number

Net Contents 2 CU FT (56.6 L)

8 SOIL AND PLANT AMENDMENTS

Both soil amendments and plant amendments are now incorporated into the AAPFCO Uniform Beneficial Substances Bill.

9 Beneficial Substances

Beneficial substances encompass plant biostimulants, soil amendments as well as other chemical or biological substances beneficial to plants and/or their growing environment, but excluding primary, secondary, and micro plant nutrients (fertilizers) and pesticides. (Uniform Beneficial Substances Bill, Sec. 5 Scope)

Efficacy data may be required to support beneficial substance ingredient claims if the ingredient is not presently defined by the Association of American Plant Food Control Officials' Official Publication for the particular claim.

Any material that also makes pesticidal or plant regulator claims may be required to register with the Environmental Protection Agency and/or related state departments.

9.1 DEFINITIONS

Beneficial substances - any substance or compound, other than primary, secondary, and micro plant nutrients, and excluding pesticides, that can be demonstrated by scientific research to be beneficial to one or more species of plants, soil or media.

Plant biostimulant - a substance(s), microorganism(s), or mixtures thereof, that, when applied to seeds, plants, the rhizosphere, soil or other growth media, act to support a plant's natural nutrition processes independently of the biostimulant's nutrient content. The plant biostimulant thereby improves nutrient availability, uptake, or use efficiency, tolerance to abiotic stress, and consequent growth, development, quality or yield.

9.2 LABEL REQUIREMENTS

All beneficial substance labels must have the following six elements:

- Brand – Provide a product name
- Net Weight or Net Volume – Provide both US and metric measurements
- Name and Address of Guarantor, Registrant, and/or Manufacturer – Shall include an address for the responsible party
- Purpose Statement – Statement identifying the purpose of the product
- Directions for Use
- Statement of composition showing the amount of each non-nutritive ingredient, which is the agent in a product primarily responsible for the intended effects using the following format:

CONTAINS BENEFICIAL SUBSTANCE(S)
Name of beneficial substance __% (or acceptable units)
Genus and species of microorganism __ viable CFU/cm^3, /mL, /g, or other acceptable units

(Identify and list all beneficial substances. Substances shall include ingredient source, if applicable. Ex. "humic acid from leonardite or saponin from Yucca schidigera")
For products that claim microorganisms, labels shall also include: the expiration date for use and storage conditions.

- Note: If plant nutrients are guaranteed in the product, the heading would be revised to "ALSO CONTAINS BENEFICIAL SUBSTANCE(S)".

[Uniform Beneficial Substance Bill, Section 6] For an example of how a beneficial substance label might appear, please see Figures 7, 9, & 10.

For bulk shipments, this information must accompany the delivery as a written or printed form and shall be supplied to the purchaser at the time of delivery. [Uniform Beneficial Substance Bill, Section 6a(7)]

Each beneficial substance product shall be registered in the name of that person whose name appears upon the label before being distributed in this state. [Uniform Beneficial Substance Bill, Section 8(a)]

Each brand shall refer to a specific formulation. Different brands may refer to the same specific formulation. Products for which formulations change, such as changes in the "Contains Beneficial Substances" analysis, statement of composition, or anything that implies a different product, must obtain a new registration with a brand which distinguishes it from the previous formulation. [Uniform Beneficial Substance Bill, Section 8(c)]

9.3 Exemptions

The following soil amending materials are exempt from labeling requirements of this act. The following single ingredient soil amendments when clearly and conspicuously identified as such on the label are exempt from the statement of composition as required in Section 5, Number 6 of the Uniform Beneficial Substance Bill: Hay, Straw, Peat, Leaf Mold, Sand, Perlite, Vermiculite, Gypsum, and Vermicompost.

In lieu of a statement of composition as required in Section 5, Number 6 of the Uniform Beneficial Substance Bill, the label of the following soil amendments when clearly and conspicuously identified as such on the label shall include an ingredient statement, unless specific beneficial substance claims are made: Compost, Garden Soil, Landscaping Soil or Topsoil, Mulch or Wood Products, Planting Mix, Potting Mix, and Soilless Growing Media.

In addition to those soil amendments listed above, other products may be exempt with the permission of the state in which registration is sought.

[Uniform Beneficial Substance Bill, Section 10]

9.4 Labeling and Misbranding

Labeling means any advertising, promotional, or promotion of any beneficial substance including but not limited to all written, printed, graphic, or electronic communication used in promoting the sale of a beneficial substance. [Uniform Beneficial Substance Bill, Section 4(h)]

It can be attached to the product, accompany the product, or be entirely separate from the product.

If labeling is false or misleading in any particular way, the product is considered as misbranded. If the product is distributed under the name of another beneficial substance, it is considered as misbranded. If the product is not labeled as required, it is considered misbranded. *If the contents, ingredients, name, or claims on a product label do not match the registered label, the product is misbranded.* [Uniform Beneficial Substance Bill, Section 14]

No person shall distribute a misbranded beneficial substance. [Uniform Beneficial Substance Bill, Section 14]

Additional Notes—The Federal Trade Commission (FTC) requires that any claims made in product advertising must:

- be truthful and non-deceptive, and
- have evidence to back up any claims, prior to making the claim. The simple rule to avoid misbranding:

IF YOU CLAIM IT, YOU MUST GUARANTEE IT.

9.5 ADULTERATION

No person shall distribute an adulterated beneficial substance. A beneficial substance is deemed to be adulterated:

- If it contains any deleterious or harmful substance in sufficient amount to render it injurious to beneficial plant life, animals, humans, aquatic life, soil, or water when applied in accordance with directions for use on the label; or if adequate warning statements and directions for use, which may be necessary to protect plant life, animals, humans, aquatic life, soil, or water are not shown upon the label;
- If its composition falls below or differs from that which it is purported to possess by its label or any labeling which describes the composition of the beneficial substance;
- If it contains unwanted crop or weed seed, or primary noxious or secondary noxious weed seed.

[Uniform Beneficial Substance Bill, Section 15]

Figure 6 – Evaluation Framework for Products Containing Viable Microorganisms

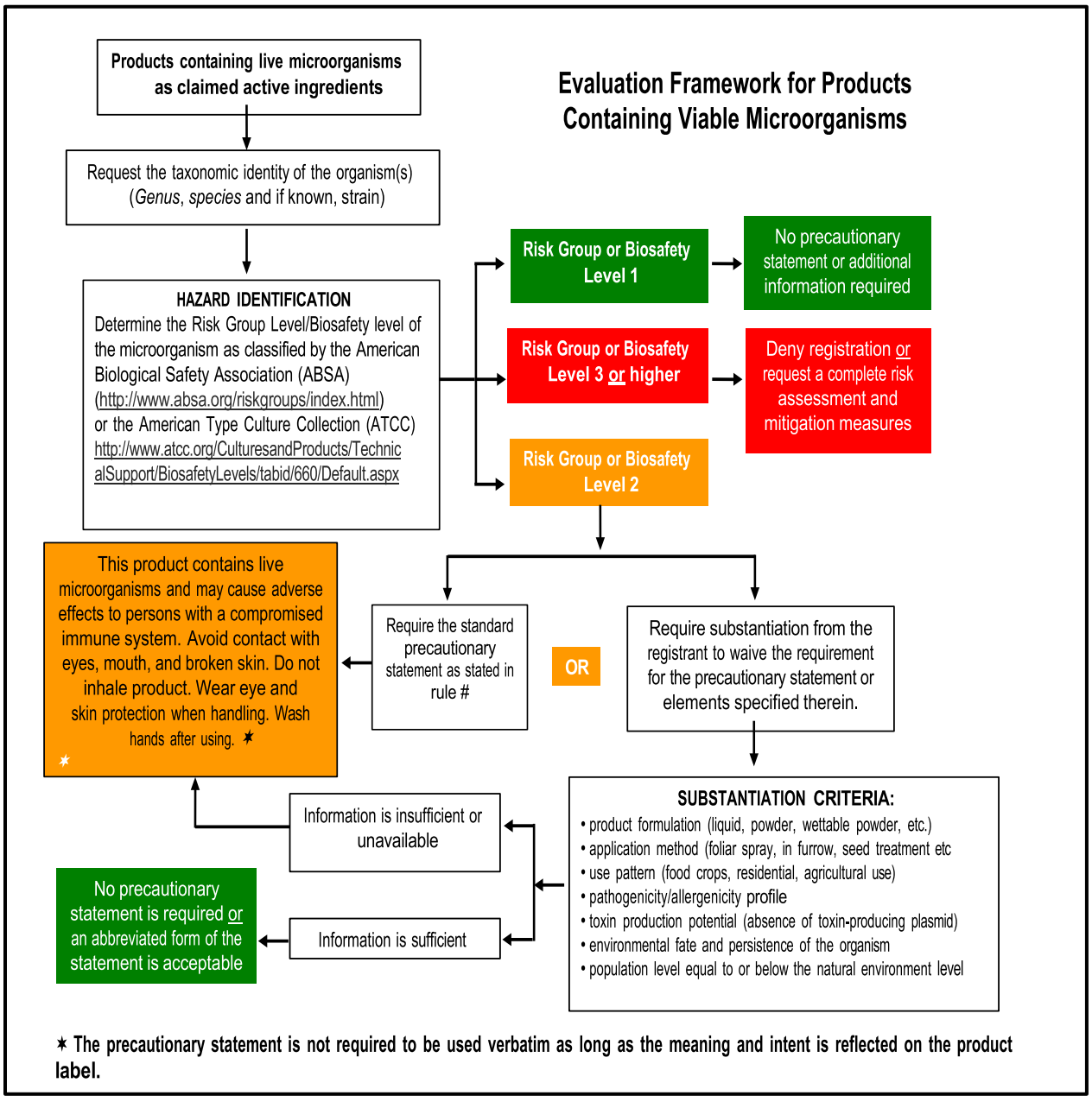


Figure 7 – Basic Elements of a Beneficial Substance Label

SuperGro
Perfector

CONTAINS BENEFICIAL SUBSTANCE(S)
Name of beneficial substance __%
(or acceptable units)

(Identify and list all beneficial substances. Substances shall include ingredient source, if applicable. Ex. "humic acid from leonardite or saponin from Yucca schidigera")

Purpose statement: This product is intended to _____.

Directions for use: XXXX

Farm Co-op
Hwy 1, Box 7
Centerville, Any State Zip Code

Net Contents – 25 lb / 2 Gal (11.33 kg / 7.57 L)

Figure 8 – Basic Elements of a Horticultural Growing Media Label

SuperGro
Garden Soil

Ingredients:

Name of ingredient, Name of ingredient 2, Name of Ingredient 3, Name of ingredient 4, etc. (in descending order of volume or weight)

Purpose statement: This product is intended to _____.

Directions for use: XXXX

Farm Co-op
Hwy 1, Box 7
Centerville, Any State Zip Code

Net Contents – 25 lb / 2 Gal (11.33 kg / 7.57 L)

Figure 9 – Basic Elements of a Beneficial Substance (Single Ingredient) Label

SuperGro
Perlite

Purpose statement: This product is intended to _____.

Directions for use: …….

Farm Co-op
Hwy 1, Box 7
Centerville, Any State Zip Code

Net Contents – 25 lb / 2 Gal (11.33 kg / 7.57 L)

Figure 10 – Basic Elements of a Microbial Beneficial Substance

SuperGro
Microbe Perfector

CONTAINS BENEFICIAL SUBSTANCE(S)
Genus and species of microorganism __ viable CFU/cm^3, /mL, /g, or other acceptable units

Purpose statement: This product is intended to _____.

Expiration date: MM/DD/YYYY

Directions for use: XXXX

Storage and handling instructions: XXXX

Farm Co-op
Hwy 1, Box 7
Centerville, Any State Zip Code

Net Contents – 25 lb / 2 Gal (11.33 kg / 7.57 L)

Figure 11 – A Complete Fertilizer Label

Super
Green
17-17-17
GUARANTEED ANALYSIS

Total Nitrogen (N)	17.00%
6.66% Ammoniacal Nitrogen	
10.34% Urea Nitrogen*	
Available Phosphate (P_2O_5)	17.00%
Soluble Potash (K_2O)	17.00%
Calcium (Ca)	1.00%
Magnesium (Mg)	0.50%
0.50% Water Soluble Magnesium (Mg)	
Sulfur (S)	1.00%
1.00% Combined Sulfur (S)	
Boron (B)	0.02%
Chlorine (Cl)	0.10%
Cobalt (Co)	0.0005%
Copper (Cu)	0.05%
0.05% Water Soluble Copper (Cu)	
Iron (Fe)	0.10%
0.05% Chelated Iron (Fe)	
0.05% Water Soluble Iron (Fe)	
Manganese (Mn)	0.05%
0.04% Water Soluble Manganese (Mn)	
Molybdenum (Mo)	0.0005%
Nickel (Ni)	0.0010%
Sodium (Na)	0.10%
Zinc (Zn)	0.05%
0.05% Chelated Zinc (Zn)	

Derived from: Diammonium Phosphate, Urea, Sulfur Coated Urea, Muriate of Potash, Calcium Carbonate, Magnesium Sulfate, Ammonium Sulfate, Borax, Copper Amino Acid Complex, Cobalt Sulfate, Iron Citrate, Ferrous Sulfate, Manganese Sulfate, Sodium Molybdate, Nickel Sulfate, and Zinc EDTA.
*3.4% Slowly available nitrogen from sulfur coated urea

CAUTION: This fertilizer is to be used only on soil which responds to Molybdenum (Mo). Crops high in Molybdenum (Mo) are toxic to grazing animals (ruminants).

Directions For Use: Apply to the soil in the spring, summer, and fall at a rate of 5 pounds per 1,000 sqft.

Registrant, Manufacturer, or Distributor
Name Mailing Address
Net Weight – 10 lb (4.5 Kg) City, State Zip Code

10 "APPENDIX A" – GLOBALLY HARMONIZED SYSTEM LABELING

Products which must meet the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals requirements in accordance with the Occupational Safety & Health Administration's (OSHA) Hazard Communication Standards, may include the information required by OSHA on the fertilizer label. (AAPFCO Statements of Uniform Interpretation and Policy 33)

11 "APPENDIX B" – FREQUENTLY ASKED QUESTIONS AND ANSWERS

Q: **I'm only going to sell my products via the internet. Does all of this labeling, licensing, and registration stuff still apply?**
All products, regardless of how products are distributed, must meet the licensing, registration, and labeling requirements of the state where the product is being distributed.

Q: **My product is organic (or "listed with WSDA or OMRI or registered with CDFA," or "only has GRAS ingredients," or "is USDA Bio-based," etc.), so I don't need to register it, do I?**
A: Yes, you do. Each of these programs have different requirements for organic input material labeling and registration. Products must also be registered in each state where they will be distributed.

Q: **Can products be "Certified Organic"?**
A: No, products are not certified organic but the individual farms are certified organic and it is up to the producer to use approved products for their certified farms. Fertilizers can be registered or listed as organic input materials

Q: **If my labels meet the guidelines in AAPFCO's Uniform Fertilizer Bill are they ready for sale in all states?** ***A:*** No. AAPFCO guidelines are the basis for most state requirements, but individual states may have additional requirements. It's a good idea to have labels reviewed by each state where you plan to sell the product before you print labels.

Q: **Will you accept chelated instead of water soluble?**
A: Some states require water soluble guarantees, so check with individual states for their specific requirements.

Q: **How are products registered?**
A: Each state has specific rules for registration, renewals, and fees, so check with each individual state for their specific registration process.

12"APPENDIX C" – AAPFCO EFFICACY DATA GUIDELINES

AAPFCO Guidelines for Efficacy Data Submission

This document provides general guidance on the submission of efficacy data to support product efficacy claims to ensure consistency and scientific validity.

The substantiation of efficacy claims shall be done in one of three ways:

1. Association with relevant published literature (Appendix A).
2. Research test results using scientifically recognized principles and methods.
3. A combination of research test results with relevant published literature.

Research tests may be conducted using the product's target market and growing system (Appendix B) in replicated "plot" research, or an alternative growing system (Appendix C) that mimics or predicts performance in the target market. Research typically measures specific outcomes, and many times measures differences in plant growth, quality or yield compared to an appropriate experimental control.

Provide Key Product Background Information Based on Claim:

1. Novel Product Composition or Ingredients:
   a) Plant Nutrients - provide guaranteed analysis, derivation statement, and laboratory test method/results to support the guaranteed analysis.
   b) Microbial Products - provide genus, species, and strains (if applicable), and test methodology/results to support identification of species and the number of variable units per cubic centimeter, milliliter, or gram.
2. Crop/Plant Efficacy Claims:
   a) Provide a list of crop(s) or group(s) for which the product is recommended with corresponding product and application rates.
3. Plant Biostimulants:
   a) Refer to the EPA's Draft Guidance for Plant Regulator Products and Claims, Including Plant Biostimulants for "non-pesticidal" claim information and examples.

Scientific Principles for Efficacy Data and Research

1. **Experimental Design:**
   Use generally accepted experimental methodology that includes appropriate experimental layout, replications, randomization, control treatments and response measures that directly support the product efficacy claim. The appropriate number of replicates will depend on the amount of experimental variation, number of treatments and the size of the treatment difference to be detected.

2. **Proper Control Treatments for Valid Comparisons:**
   a) Must include an appropriate untreated (negative) control that enables clear distinction of the claimed treatment effect without confounding factors. For example, a research test to support an efficacy claim specific to a beneficial substance in a fertilizer product must include a negative control of fertilizer alone to clearly assess the beneficial substance efficacy claim.

b) May include positive controls, such as a comparative standard product, which exhibits known effects like those being claimed.
c) When possible, for experimental designs where a challenge condition is used, control data should be generated in the absence of the challenge condition (e.g., drought, heat, reduction of input).

3. Location of Research Trials:

a) Select relevant test locations based on the 1) proposed claim, 2) target markets and growing systems and 3) sensitivity of the material and claim to soil and environmental conditions.
b) Research tests to support efficacy claims for improved crop yield or quality should be conducted using the target market growing system (Appendix B). Other efficacy claims may be supported by tests conducted in alternate growing systems (Appendix C).
c) Research data generated outside the US will be acceptable provided it is applicable to the target growing system, efficacy claims, and meets applicable efficacy data guideline criteria within this document.

4. Selection of Test Crops:

Use specific crop(s) and/or crop groupings (i.e. Fabaceae/legumes, Poaceae/cereal, etc.) that are appropriate to the product efficacy claim and target market.

5. Number of Research Tests (Locations, Seasons):

Identify and substantiate the number of trials, locations and seasons depending on the product efficacy claims, target growing systems, and expected product performance in various soil and environmental conditions.

6. Statistical Analysis:

The Association recognizes that not all label claims require submission of supporting data, such as those well accepted and consistent with the scientific community or scientific literature. Rather, AAPFCO recommends submission of efficacy data for claims or compositions that are novel or unique. Alternative statistical analysis or research standards may be considered if they are statistically valid and clearly demonstrate the intended effects or claims.

a) Research tests and data must include statistical analysis appropriate to the experimental design and test objectives. Consultation with a statistician on design and analysis is highly recommended.
b) A common objective of data analysis is to determine whether a treatment is statistically different than an appropriate control. Null Hypothesis Significant Testing and the P-value (significance level) is a widely used standard to measure evidence of a treatment effect and must typically fall below 0.05% ($P<0.05$) for statistical significance.
c) While the P-value is a commonly recognized standard, the Association may recognize statistical methods other than Null Hypothesis Statistical Testing and P-values, such as regression, Bayesian analysis, nonparametric tests, confidence intervals, etc., if the method validates the test objectives, experimental design and data.

EFFICACY CLAIM APPENDICES

APPENDIX A.

Substantiation of product efficacy claims using scientific literature

1. Identify product claims using the exact wording that appears on the product label.
2. Identify ingredients relevant to the efficacy claim.
3. Identify recommended rates of application on the label.
4. Provide substantiation for the efficacy claim(s) by providing literature that is appropriate based on product composition, application rates, target market growing system, etc. Literature includes peer-reviewed scientific literature and research reports. Other substantiated literature may also be considered.
5. Scientific literature does not include testimonials, abstracts or marketing materials.

APPENDIX B.

Examples of target markets and growing systems

1. Field-grown agriculture
2. Production greenhouse
3. Indoor commercial farming
4. Consumer turfgrass
5. Consumer gardens (flowers, vegetables, potted plants)
6. Professional turf (golf, sports fields)
7. Professional container-grown nurseries
8. Other (define)

APPENDIX C.

Examples of alternate growing systems

1. Research greenhouses
2. Growth chambers
3. Rain-out shelters / Lysimeters
4. Laboratories
5. Other (define)

Researchers using alternative growing systems may need to justify that the results are applicable to the target market growing system(s) and/or demonstrate that results can be replicated in real-world growing conditions (soil type, pH, climate, etc.).

APPENDIX D.

Descriptive statistics

1. A full and complete reporting of statistics that are relevant to the study question is a fundamental component of reporting any data set.
2. The descriptive statistics should fully disclose the magnitude of treatment effects and variability.
3. Examples of descriptive statistics include:
    a. A measure of central tendency:
        i. Mean, median, mode
        ii. Weighted mean (e.g., across soil types)
        iii. Mean adjusted for other factors or covariates (e.g., rainfall, temperature, etc.).
    b. A measure of variation: range, variance, standard deviation, coefficient of variation, or quartiles.

4. The environmental conditions and plant species involved in the estimate will strongly affect the descriptive statistics and should be clearly stated to understand the limitations of the estimates.