

# **Turf and Landscape Fertilizer**

## **A Biotic Revolution**





## Why Turf Experts Choose Perfect Blend Biotic Fertilizers

Turf experts who choose Perfect Blend biotic fertilizers appreciate the value of natural fertility. Perfect Blend biotic fertilizers are designed to mimic nature and efficiently accelerate the build of natural fertility in topsoil. Perfect Blend biotic fertilizers are at least 30 times more efficient than nature itself, with the ability to grow turf to its full genetic potential while sustaining and amending the topsoil.

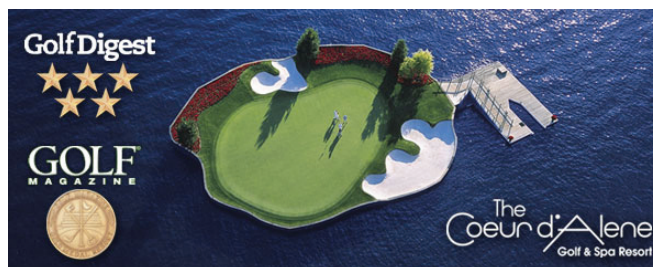
Naturally fertile soils grow stronger, healthier and greener turf without as much water as conventionally fertilized grass. Grass grown in these soils remains green longer in the fall and greens up faster in the spring. Due to its more robust topsoil mineral values, turf grass grown in naturally fertile soil is less susceptible to disease, insect attack and fungus. Turf experts who use Perfect Blend realize that in order to grow superior turf they must actually grow two different crops. The first is healthy soil microbes, while the second is the actual turf grass. Soil microbes are the basis of all natural fertility. This knowledge – and knowing how to tune a fertilizer to work in a biotic manner – is what enabled Perfect Blend to seek United States Patent protection for its innovations. Perfect Blend is the global leader in the development and manufacture of biotic fertilizers, developing the first patents in biotic fertility.

Every bag of Perfect Blend biotic fertilizer delivers the optimum nutrition levels for healthy topsoils that are rich in natural fertility. During manufacturing, Perfect Blend is carefully formulated to provide soil microbes with a full range of primary, secondary and trace minerals at the most advantageous pH level. Perfect Blend contains high levels of ionic forms of chelated minerals. As a result, the nutritional components of Perfect Blend biotic fertilizers are delivered in a form that is immediately usable by both plants and microbes. These unique features make Perfect Blend a breakthrough concept in soil fertility.

Perfect Blend biotic fertilizers have an amazing ability to accelerate the reproduction of topsoil microbes. Our fertilizers provide topsoil microbes with nutrition formulated to build very large microbial populations through protein synthesis. After only a brief life span, topsoil microorganisms die and leave their remains in the soil in the form of soil acids, which are stable forms of nutrients that give the soil its dark color. Topsoil microorganisms are mostly protein, and they

contain about 14% nitrogen and a full range of the nutrients needed to grow healthy turf. Perfect Blend biotic fertilizers bring Mother Nature's best fertility to you – in a way that's even more efficient than nature.

## Testimonial



Coeur d'Alene Resort Golf Course was elected as a Gold Medal Resort by Golf Magazine in 2008 as one of only 25 resorts to receive this distinguished honor. Also, they received a 5-Star designation from Golf Digest – one of only 16 out of 6,200 courses rated to receive the top designation.

*"We have used Perfect Blend the past two years, their product line has become the cornerstone of our fertility program."*

**Kevin Hicks, Superintendent**  
Coeur d'Alene Resort Golf Course



## The Biotic Revolution

From the PBO laboratories, the world leader in organic fertilizer research and development, comes the world's first patent for a biotic fertilizer™. Biotic fertilizers are carefully designed to provide high-quality complex nutrients directly to topsoil microorganisms. Topsoil microorganisms – and their ability to convert organic matter into nutrients easily usable by plants – are the basis of all soil fertility.

With an understanding of natural soil fertility that is unsurpassed in the organic fertilizer industry, PBO has developed a fertilizer that actually surpasses the speed and effectiveness of naturally occurring fertility. Nature can take 30 years to rebuild a single inch of topsoil. PBO biotic fertilizer can rebuild topsoil at a much faster rate while at the same time providing a level of fertility that allows all turf varieties to reach their full genetic potential.

Through the new process-manufacturing techniques developed by PBO, the organic feedstock is carefully processed, augmented, reacted and dried. The molecular structure of the original feedstock in PBO fertilizer is changed into a highly soluble nutrient food for topsoil microbes. Not only is the carbon structure altered, but so are the structures of the other complex elements. One of the patented advantages of biotic fertilizers™ are the high level of chelated elements that are already in a form that plants can use.

Most organic nutrients, whether manure, compost or other organic material, must first undergo physical decomposition before seeping into the structure of the topsoil in the form of liquid nutrients. This decomposition requires bacterial and fungal action and results in the volatilization of important nutrients in the form of methane, ammonia, CO<sub>2</sub> and hydrogen sulfide. The act of decomposition itself draws heavily on the nutrient resources of the organic material – leaving less nutrition for use by soil microbes.

Biotic fertilizers™ manufactured only by PBO, are highly water-soluble. A large percentage of the material does not need to undergo the decomposition phase that devalues organic nutrients. Instead, due to its water-soluble nature our fertilizer bypasses the need for decomposition of microbes and seeps directly into the topsoil. Then our specialized fertility microorganisms use the nutrients to increase soil fertility by building usable soluble soil acids and creating the pigmented polymers that add dark color to the soils.

It is this ability to bypass decomposition microorganisms and go directly into the topsoil, where topsoil microorganisms can immediately use it to expand their populations, that makes Perfect Blend Organics Biotic Fertilizers™ so effective.

## The Biotic Fertilizer™ Advantage

**How does a biotic fertilizer™ work?** It works as a biological fuel. For about 150 years turf management agriculture has been mired in the mistaken belief that the soil is mostly a chemical medium. Now we know that soil fertility is the result of biological activity. Chemicals can affect this activity, in both a positive and a negative manner. The very best soils are and always will be the result of topsoil microorganisms storing nutrients from decomposed organic matter in the soil, in the form of stable carbon-structured nutrients. The very best of nature's soils do not require any fertilizer. Biotic fertilizers™ are designed to mimic and surpass nature's ability to build soil fertility. Biotic fertilizer™ nutrients transform into stable fertility nutrients far more efficiently and quickly than nature's own cycle of annual nutrient replenishment and fertility build.

Soil scientists believe that an acre of healthy topsoil contains about one ton of bacteria, one ton of fungus and two to three tons of other living microorganisms. These living microorganisms are the source of soil fertility as a result of their actions and populations. Topsoil bacteria are the first responders to a flood of new organic nutrition into the topsoil. When organic nutrients are provided to the topsoil, bacteria go to work to devour the food, and their population "blooms." With an increase in food comes an increase in the population of beneficial soil bacteria.

Bacteria can double their population within to an hour. They live only a short time before they divide and then die. The waste materials from this process are the materials that stay in the soil in the form of stable soil acids.

Soil acids are the complex pigmented polymers that contain all the nutrients in the bodies of the bacteria and, in turn, are available to provide soluble ionic forms of nutrients to plants and turf. Eventually, as the nutrition is used, the entire mass of the bloom is left and incorporated into the topsoil.

By building large populations of microbes in soil, a turf manager can increase soil fertility naturally. By providing adequate amounts of Biotic Fertility™ to soils, nutrients in soil can be efficiently increased on a cost-effective basis. Providing sufficient nutrients to allow the turf to reach its full genetic potential. At the same time, the usable nutrient levels in the soils are being amended and made sustainable.



## What is Perfect Blend

We are a leading manufacturer of organic plant food, highly regarded for excellent quality and service. Perfect Blend is dedicated to using the latest in scientific research and technology to create and manufacture organic products that incorporate a complete philosophy of advanced soil nutrition. Perfect Blend has undertaken independent research and development aimed at advancing our ability to offer the finest soil nutrition products in the world.



## A Complex Nutrition Enabling Fertilizer

Perfect Blend fertilizer is a Complex Nutrition-Enabling Fertilizer (CNEF) – a totally new concept in organic fertilizers, supplemented with a rich, balanced combination of secondary and mineral nutrients. The process that transforms Perfect Blend from an unpredictable, unreliable, labile feedstock into a slow release fertilizer is acid-driven hydrolysis. This patented, controlled-conversion manufacturing process actually alters the molecular structure of the chicken waste to render it into a predictable, slow-release material. This manure base, with added secondary mineral nutrients, provides a complete blend designed to provide turf, plants and microbes with a complete and complex nutritional fertilizer. Our formulation provides a total available nutrition program for soil microbes.

## The Unique Advantages of Perfect Blend Biotic Fertilizers

### Complete Biotic Nutrition

Perfect Blend biotic formulations are nutritionally complete and balanced. Perfect Blend formulations are complete with a balanced formulation of the primary, secondary and trace mineral nutrients necessary to achieve the highest level of microbial growth. As a result, Perfect Blend avoids the problems that occur when soil microbes receive only partial nutrition, which results in a slower pattern of stop-and-start growth of microbial populations.

### pH-Balanced Formulations

Perfect Blend biotic fertilizers are made using proprietary stepped algorithms to lower the pH of the manure feedstock from a mid-seven range to the low-six range that is ideal for use by soil microbes. This process provides a pH-balanced formulation that soil microbes find much more favorable than unbalanced blended compost or mono-ingredient formulations.

### Homogenized Formulations

Fertilizers that are simply blended are not necessarily homogenized. Perfect Blend biotic fertilizers are homogenized, maximizing the efficiency of transformation from a solid state into forms that are microbial accessible.

### Chelated Nutrients

Mineral nutrients in Perfect Blend biotic fertilizers are chelated during manufacturing. This allows the mineral nutrients in Perfect Blend biotic fertilizers to be immediately available in proper ionic form for use by plants and soil microbes. Perfect Blend biotic fertilizers avoid the need for in-ground chelation, which is a process required of other fertilizers and soil amendments.





## Nature's Supreme Recyclers: Fulvic and Humic Acids

Soluble fulvic and humic acids are the true engines of the soil. For organic growers, they are the single most essential aspect of the soil, as they are the foundational nutrition source for all plants and soil microbes. Soil acids are nature's supreme recyclers. Taking nutrients from decomposing organic matter, they store the nutrients in the form of chelated structures within complex molecular structures. Scientists describe these soil acids as pigmented polymers, because soil acids have a distinct brown or golden color that imparts color to the soil. Very large amounts of soil acids will, over time, turn soils black. These stable storage structures form as a result of bacterial action in much the same manner as wine. Within their complex structures, nature stores nitrogen, phosphate, potash, sulfur, calcium and all the trace minerals in forms that can wait for years until needed by plants or viable bacteria, fungus or other microbes. Only nature can make living soil acids, and the only place nature does so is in the air-breathing sections of the earth known as topsoil.



## The Benefits of Soil Acids

### THE BENEFITS OF SOIL ACIDS

*These powerful humic substances are the foundation of all good soils. Soil acids – and their moisture-rich forms, soil acid gels – are universally found in healthy topsoil all over the world, in all climates and in all soil types.*

### Soil Acids Store Nutrients from Decomposed Organic Matter

All elemental nutrients from decomposed organic matter are stored in the form of soil acids until needed by plants or soil organisms.

### Soil Acids Feed Plants Directly

Fulvic acid is trans-cellular, meaning it can easily pass into turf roots, carrying with it the stored primary, secondary and trace mineral nutrients critical to a plant's health.

### Soil Acids Feed Plants Indirectly

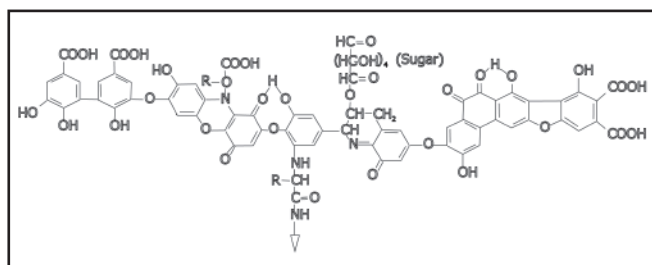
Soil acids are a primary source of food for soil microbes. As they reproduce and die, the microbes leave behind their protein-rich bodies, which contain 14% nitrogen as well as secondary nutrients.

### Soil Acids Enrich and Protect the Soil

Soil acids collect and hold moisture in their structures up to 98% of their volume, forming gels that separate soil particles and create aggregation. In heavy rainfall, these gels protect soil from erosion.

### Soil Acids are a Primary Chelation Mechanism

Soil acids act as a primary chelating agent to render elemental minerals into a chelated carbon molecular form that plants and microbes can easily use.



Molecule Structure

# Conversion of Organic Materials into Soil Acids

## ALL ORGANIC MATERIALS APPLIED TO THE SOIL CONVERT FROM A SOLID FORM INTO SOLUBLE SOIL ACIDS FORMED BY SOIL BACTERIA

When any organic material is applied to soil, its effectiveness is measured by the amount of soil acids it generates. All organic materials will eventually decompose into soil acids. Microbes are most efficient at decomposing organic materials when both pH and digestive ability are favorable. What varies is the amount and quality of soil acids that result from the decomposition. In soils with large quantities of soil acids containing high levels of chelated minor nutrients, soil structures will be superior. Turf grasses grown on soils high in soluble soil acids require less water and are more resistant to drought.

**Biological Fertilizers (CNEF)** - The way to measure the efficiency of organic materials is by their volume of conversion into soil acids. Perfect Blend fertilizers are uniquely manufactured to achieve the highest rate of efficient conversion:

- *CNEF-type fertilizer is pH-balanced.*
- *It is nutritionally balanced and stable.*
- *It offers the correct carbon/nitrogen balance.*
- *Perfect Blend Organics have a homogenous texture, and it contains the correct bacteria/fungus balance.*
- *CNEF is nutritionally packed with high levels of chelated minerals.*

**Blended Mono-Ingredients** – Most blended mono-ingredient organic fertilizers are not reacted to reach a uniform pH that is ideal for microbial conversion. While an analysis of the product may seem to be similar to a biological fertilizer, these products offer soil microbes with a range and variety of pH values that may or may not provide microbes with maximum efficiency.

**Manure** – Manure's poor transformation efficiency is mainly due to high levels of bacteria, which accelerates the volatilization of nutrients into the atmosphere – leaving fewer nutrients for conversion into soil acids. As a biologically active nutrient, it converts organic material into soluble soil acids poorly. If the manure contains shavings, litter or sawdust, its carbon/nitrogen balance can easily be skewed, causing nitrogen immobilization.

**Protein-Based Products** – These products have a low solubility factor and thus a lower conversion factor.

## INDEPENDENT LABORATORY TESTS SHOW A 500% INCREASE IN SOIL ACIDS WITH PERFECT BLEND CNEF BIOLOGICAL FERTILIZERS

### It's all about the conversion of organics into soil acids.

Conversion of organics into soil acids starts with the properties of the organic material. All organic material will, sooner or later, convert into soil acids. The question is one of efficiency in the process: ***How efficient is the organic material being applied?*** Tests have proved that Perfect Blend is extremely efficient in the conversion from a dried state into soluble soil acids – which is attributable to the research and technology that has gone into every ton of Perfect Blend Organics fertilizer. At Perfect Blend we know that soils are a biological root zone rather than a strictly chemical medium. Our fertilizers are built to feed soil microbes; we know the growth of these microbes will work in a synergistic manner to increase overall soil nutrition. Independent-laboratory biological tests (Soil Foodweb, Inc.) show that a massive and balanced increase in soil microbes occurs within 72 hours of application of Perfect Blend Organics. The soil microbial increase is balanced between active bacterial biomass and active fungal biomass. Given the short life-cycle of soil microbes, it is only a matter of days before they die and lend their high-protein bodies to the soil. When this occurs, the 14% nitrogen content of protein, along with the other natural nutrients, is left in the soil to be combined into the soil acid matrix for a slow natural-release feed to your turf.





# The Benefits of Mycorrhizal Fungi

## What are mycorrhizal fungi?

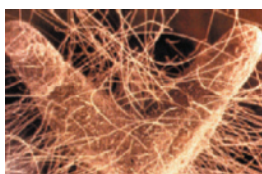
Mycorrhizae is a root fungus, often thought of as the biological cornerstone of plant life on earth, dating back to the beginning of time. More than 90% of plants in nature have established a highly beneficial, symbiotic relationship with this unique group of soil organisms. Mycorrhizal fungus colonies grow in and around plant roots, sending out thousands of tiny tubes into the surrounding soils to find and uptake plant nutrients. These hollow tubes, known as hyphae, are primary conduits of minerals, soil-contained amino acids, phytochemicals, moisture and a multitude of other nutrients. The mycorrhizal fungus feeds the plants, and in return the plants provide CO<sub>2</sub> and other nutrients to the fungus. The fungus also stores any excess, unneeded nutrients for future plant use in the form of glomalin, a high-grade nutrient source. The tiny mycorrhizal hyphae are vital in forming high-grade organic soils, as is glomalin, which becomes an important component of soil organic matter. Vital mycorrhizal colonies can vanish due to over-fertilization, compaction or previous misuse. Perfect Blend fertilizers reinforce existing colonies and re-start new mycorrhizal colonies in soils where natural colonies have been lost. The high-quality nutrients provided by Perfect Blend fertilizers are formulated at the right pH and nutrient balance for optimum mycorrhizae growth.

## Should you use mycorrhizae in your turf program?

Perfect Blend has documented higher-quality turf grasses from mycorrhiza-inoculated fertilizers. To find out whether your golf course would benefit from mycorrhizae, give us a call today and ask for a technical consultant who will help you make that determination.

## What are the other benefits of mycorrhizal fungi?

Increased drought protection, better moisture management in root zone profiles, increased soil values and more robust plants are all benefits derived from mycorrhizal fungi. Mycorrhiza is not a silver bullet that will immediately correct abused soils or poorly cultivated turf. It is, however, a valuable tool for superintendents who want to maximize the genetic potential of their courses.



Electromicrograph of two mycorrhizal root tips on pine.



## Perfect Blend vs. Other Organic Fertilizer

At Perfect Blend, our high-quality fertilizers are manufactured with careful attention to every aspect of the ingredients and process, toward the final goal of providing a complete, balanced formulation for use by soil microbes. We understand that the “mineralization” of organic fertilizers is in reality a transformation of nutrients from their original form into a form that is usable by the plant. A transformation must occur in the digestive system of the microbes, and in microbially induced biochemical reactions. All Perfect Blend formulations are oriented toward the goal of feeding soil microbes. Soil microbes always eat first.

A highly efficient organic fertilizer must provide complex nutrition and be carefully homogenized, hydrolyzed, pH-balanced and agglomerated into fully nutritional granules in order to become a “perfect food” for soil microbes. Not all organic fertilizers or materials efficiently convert into the fulvic and humic substances that soil microbes require. Some, such as blood meal and dehydrated manures, are labile forms that release too quickly. Feather meal- and bone meal-based products are stubborn release forms that release too slowly to provide plants with nutrients when required.

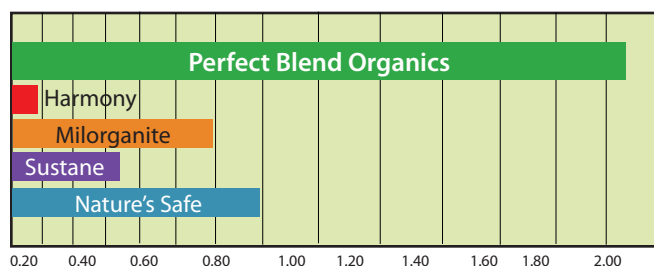
**In order to provide a high efficiency organic fertilizer must be:**

- **Fully nutritional** – In order for an organic fertilizer to be effective, it must enter the soil as a homogenized, uniform, soluble tea that contains all 15 nutritive elements plants require. Fertilizers that lack all the essential nutrients only provide weakened and incomplete fulvic and humic molecular structures.
- **Homogenized** – Soil mineral reactions require a homogenized mix of complete primary, secondary and trace nutrients in order to build the complex molecular structures of fulvic and humic acids. Without a homogenized food source, the fulvic/humic acid molecular builds are fragmented and lacking in critical elements.
- **Hydrolyzed** – A highly efficient organic fertilizer must be hydrolyzed in order to stabilize the nutrients and pH and, on a molecular level, convert the nutrients into an efficient, stable, slow-release product. Hydrolyzed products are very efficient in converting to fulvic and humic acids.

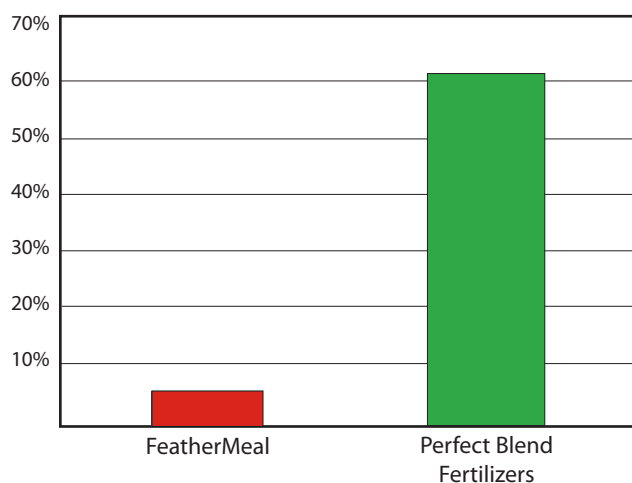
- **pH-balanced** – Soil microbes prefer slightly acidic foods in the 6.1 – 6.5 pH range. Organic plant foods within this pH range convert into usable forms more efficiently than higher or lower pH-range nutrients.

- **Agglomerated** – During the agglomeration process used by Perfect Blend, internal moisture is forced to the surface, where it can be easily removed with a minimum of heat.

**AMINO ACIDS / UNITS OF PROTEIN**



**SOLUBILITY INDEX**



- **Solubility** – The most important factor in the transformation of a solid organic fertilizer into stable soil nutrients. A higher solubility index indicates a faster entry into the soil by organic nutrients.



# Perfect Blend Outperforms Nature Safe in University of Florida Trials

## TURFGRASS RESPONSES TO ORGANIC FERTILIZERS

### RESEARCH REPORT:

April 26, 2005

### PRINCIPAL INVESTIGATOR:

Dr. John Cisar

### OBJECTIVE:

To determine the efficacy of several organic fertilizers on greens height bermudagrass in south Florida.

### TREATMENTS:

1. Perfect Blend 4-4-4 at 2.0lb N/1000 ft<sup>2</sup>
2. Nature Safe 5-6-6 at 2.0lb N/1000 ft<sup>2</sup>

### MATERIALS AND METHODS:

The above treatments were applied to a Tifdwarf USGA spec green on January 27, 2005. A second treatment application was made on March 14, 2005. The experiment was set up as a randomized complete block with four replications of 3ft x 6ft plots. Treatments were applied once for this 2 month study and were watered in immediately after application with 0.25 inches irrigation. For the duration of the study, quality and color ratings (scale of 1-10 with 10=dark green turf, 1 =dead/brown turf, and 6=minimally acceptable) were taken and clipping samples for tissue dry weight were taken throughout the experiment. All data was subject to statistical analysis and significant means were identified.

### RESULTS AND DISCUSSION:

Turfgrass quality and color were improved by increasing N rate (Tables 1a and 1b and 2a-2b). On one date (3/26), the 4-4-4 product had better turf quality and turf color than the 5-6-6 product following a second application of products (Tables 1b and 2b). On most dates, the lower N rate was near or below acceptable turf quality and color. Turfgrass clipping dry weights were improved by N rate (Table 3).

**Table 1a. Turfgrass quality ratings for Perfect Blend Test**  
PB=Perfect Blend, NS=Nature Safe / +, ns, and \*\* =P<0.10, P>0.10 and P<0.01 respectively.

SOURCE	Lbs N/M	1/27	2/7	2/25	3/7	3/10
PB 4-4-4	2.0	6.4ab	6.6	6.6a	7.3a	7.4a
NS 5-6-6	2.0	6.1b	6.5	6.4a	6.9a	7.0ab
SIGNIF	- - -	+	ns	**	**	*

**Table 1b. Turfgrass quality ratings for Perfect Blend Test**  
PB=Perfect Blend, NS=Nature Safe \*\* =P<0.01

SOURCE	Lbs N/M	3/12	3/26	4/4	4/22
PB 4-4-4	2.0	7.6a	7.9a	6.6a	7.1a
NS 5-6-6	2.0	7.0a	6.8b	6.3a	6.9a
SIGNIF	- - -	**	**	**	**

**Table 2a. Turfgrass quality ratings for Perfect Blend Test**  
PB=Perfect Blend, NS=Nature Safe / ns and \*\* =P<0.10, P>0.10 respectively.

SOURCE	Lbs N/M	1/27	2/7	2/25	3/7	3/10
PB 4-4-4	2.0	6.5b	7.3a	7.3a	7.6a	7.6
NS 5-6-6	2.0	7.0a	6.9a	6.9a	7.3a	7.3a
SIGNIF	- - -	**	**	**	**	ns

**Table 2b. Turfgrass quality ratings for Perfect Blend Test**  
PB=Perfect Blend, NS=Nature Safe / \* and \*\* =P<0.10, P>0.05 respectively.

SOURCE	Lbs N/M	3/26	4/4
PB 4-4-4	2.0	7.6a	7.0
NS 5-6-6	2.0	6.9c	6.8a
SIGNIF	- - -	**	*

**Table 3. Turfgrass quality ratings for Perfect Blend Test**  
PB=Perfect Blend, NS=Nature Safe / ns, \* and \*\* =P<0.10, P>0.05 and P<0.01 respectively.

SOURCE	Lbs N/M	1/27	2/7	3/7	4/5
PB 4-4-4	2.0	4.5	8.3a	6.0a	3.7a
NS 5-6-6	2.0	5.2	7.5a	5.4a	3.5a
SIGNIF	- - -	ns	*	**	*

Turfgrass quality ratings based on a 1-10 scale with 10 = dense green turf, 1=dead turf and 6=minimally acceptable turf  
Means with the same letter within a column are not significantly different according to Duncan's Multiple Range Test.

# Introducing Perfect Blend's Family of Advanced Technology

## 100 % ORGANIC AND ORGANIC BASED FERTILIZERS

### Perfect Greens™ 4-4-4 SGN100

- Balanced Granulation
- 100% Organic Balanced 15 Nutrient Complex Nutrition
- Fertilizer with slow release base

### Perfect Soluble™ 4-4-4 / 8-4-5

- 40 Micron Minus Soluble Powder
- Organic Base and Stabilized; slow Release; Hydrolyzed Urea
- Balanced 15 Nutrient Complex Nutrition slow release base

### Perfect Greens™ 8-4-5 SGN100

- Balanced Granulation
- Organic Base and Stabilized; Slow Release; Hydrolyzed Urea
- Balanced 15 Nutrient Complex Nutrition slow release base

### Perfect Fairways™ 8-4-5 SGN150

- Balanced Granulation
- Organic Base and Stabilized; Slow Release; Hydrolyzed Urea
- Balanced 15 Nutrient Complex Nutrition slow release base

### Perfect Greens 10-3-7 SGN100

- Balanced Granulation
- Organic Base and Stabilized; Slow Release; Hydrolyzed Urea
- Balanced 15 Nutrient Complex Nutrition slow release base

### Perfect Fairways 10-3-7 SGN150

- Balanced Granulation
- Organic Base and Stabilized; Slow Release; Hydrolyzed Urea
- Balanced 15 Nutrient Complex Nutrition slow release base

### Perfect Fairways 16-3-7 UFLEXX SGN150

- Balanced Granulation
- Organic Base and Stabilized; Slow Release; Hydrolyzed Urea
- Balanced 15 Nutrient Complex Nutrition slow release base

## MYCORRHIZAL INOCULANTS

Mycorrhizal inoculants are optional for all Perfect Blend fertilizers. Typical additive is a blend of three dormant Mycorrhizal spore species, Glomus intradices, G. aggregatum, and G. mosseae at approximately .125 propagules per cc. Perfect Blend Fertilizers feature a stabilized, slow release organic base and are fortified with the 15 nutrients your soil requires for peak performance. Ask your distributor for informational sheets with full guaranteed analysis for different products.



Sprayable Micronized Soluble Powder



SGN 100 Greens Grade



SGN 150 Fairways Grade



Uflexx™ and other Custom Blends available upon request



## Advanced Technology

### PBO CAN BE SAFELY USED ON BOTH COOL- AND WARM-SEASON GRASSES

**Advanced Technology** – The homogenous formulation of odor-neutralized Complex Nutrition-Enabling Fertilizer™ fuels the powerful microbial soil engines that increase turf nutrition in both warm-weather and cool-season grasses.

**Slow Tea Release** – Perfect Blend Organics builds condensed, high-soluble nutrient fulvic and humic acids in soils that will provide a predictable, long-term slow-release nutrition for turf.

#### Increased Concentrated Soil Organic Acids

PBO will help sustain grasses through drought conditions, and provide a faster green after cold temperatures.

**Perfect Blend Fortified Fertilizers** – These blends are made with stabilized slow-release hydrolyzed urea that slowly meters nitrogen into the soil. This allows full utilization of the organic base.

**Formed / Not Blended** – Our uniform granulation process means each granule is a complete homogenous blend of Complex Nutrition Enabling Fertilizer™ with a formulation of 15 minor element nutrients.

**Environmentally Safe** – PBO has a very low leach factor; it will not over-nutrient ponds, creeks or lakes. It meets EPA standards for low-leach products.

#### Complete Secondary and Trace Mineral Formulation

– PBO formulations feature high calcium, balanced sulfur and complete trace minerals.



### Organic Food Program Registered Material

In accordance with chapter 15.86 Revised Code of Washington and rules as set forth in chapter 16-160 WAC, the following material has been verified to comply with 7 CFR, Part 205 United States Department of Agriculture National Organic Program.

### Perfect Blend 100% Natural Organic Fertilizer Enhanced 4-4-4

**Material Type:** Fertilizer & Soil Amendment

**Material Sub-Type:** Blended Fertilizer

**Restrictions on Use:** Soil deficiency must be documented by testing

**Registered by:** Perfect Blend LLC  
dba Perfect Blend Organics  
188 106th Avenue, NE  
Suite 401  
Bellevue, WA 98004

Miles McEvoy  
**Organic Program Manager**

AGR 2291 (R/9/06)

A handwritten signature in black ink, appearing to read "Miles McEvoy".





# BIOTIC 4-4-4 SGN100

Perfect Blend 4-4-4 is designed, when applied correctly, to meet your fertilizer needs for turf and landscape.

## Proprietary Process!

Perfect Blend fertilizers are made using a proprietary process that produces a high quality nutrition to soil microbes that are responsible for breaking down minerals for plants while helping to maintain a balanced pH in your soil.

## Mycorrhizal Spore Inoculants

Mycorrhizal fungi are not hazardous to humans and provide great benefits to most turf grasses, plant, shrubs, and trees. Perfect Blend fertilizer is inoculated with a blend of three dormant mycorrhizal spore species, Glomus intraradices, G. aggregatum and G. mosseae at approximately 2.58 propagules per gram total. 100% mycorrhizal strength guaranteed for two years after bag crimp date if product is kept in a dry location at less than 110° F. Fertilizer nutrient values expire after seven years.

## APPLICATION DIRECTION:

**Established Turf grass:** Apply as a top dressing for fairways, rough, lawns, greens, landscapes, or on any established grass. Apply 12.5 lbs to 25 lbs per 1,000 square feet for application of 0.5 lb. to 1lb. of actual nitrogen per 1,000 square feet. The maximum value of these fertilizers is obtained when applied during aeration.

## Ornamentals and Flower Beds:

Apply 1 lb. (Approximately 4 cups) per 25 sq ft. Work into the soil prior to placing flowers or ornamentals. Repeat application when buds bloom and in the late fall before frost.

## Starter or Grow-Ins:

Apply 25 lbs of fertilizer per 1,000 sq. ft. for 1 lbs. of nitrogen. Till or rake into the top 2"-4" after surface spreading.

## Bulk Applications:

Apply 1,250 lbs of fertilizer for each 50 lbs. of nitrogen required. Apply 2,500 lbs. of fertilizer for each 100 lbs. of nitrogen required. Apply 5,000 lbs. of fertilizer for every 200 lbs. of nitrogen required.

SPREADER SETTINGS					
	1/2 Lbs. N	1 Lbs. N		1/2 Lbs. N	1 Lbs. N
LELY	7-25'	7.5'-25'*2	SCOTTS 2000	U	U*2
LESCO	0	0*2	SCOTTS R8	S	S*2
PRIZELAWN	0	S	VICON	43-25'	45-25'*2

## Guaranteed Analysis

Total Nitrogen (N).....	4.00%
0.40% Ammoniacal Nitrogen	
0.03% Nitrate Nitrogen	
1.50% Water Soluble Nitrogen	
2.07% Water Insoluble Nitrogen *	
Available Phosphate (P <sub>2</sub> O <sub>5</sub> ) .....	4.00%
Soluble Potash (K <sub>2</sub> O) .....	4.00%
Calcium (Ca) .....	7.0000%
Magnesium (Mg) .....	0.7000%
0.70% Water Soluble Magnesium (Mg)	
Sulfur (S) .....	3.0000%
3.00% Combined Sulfur (S)	
Boron (B) .....	0.0200%
Cobalt (Co) .....	0.0005%
Copper (Cu) .....	0.0500%
Iron (Fe) .....	0.1000%
0.10% Water Soluble Iron (Fe)	
Manganese (Mn) .....	0.0500%
Molybdenum (Mo) .....	0.0005%
Sodium (Na) .....	0.1000%
Zinc (Zn) .....	0.0500%

## Derived From:

Chicken Manure, Elemental Sulfur, Manganese Sulfate, Ferrous Sulfate, Copper Sulfate, Cobalt Sulfate, Molybdenum Oxide, Boric Acid & Sulfate of Potash.

\* Slow Release Nitrogen from Chicken Manure

## ALSO CONTAINS NONPLANT FOOD INGREDIENTS

## Mycorrhizal spore species:

Glomus intraradices 0.86 propagules per gram  
Glomus aggregatum 0.86 propagules per gram  
Glomus mosseae 0.86 propagules per gram

Chlorine (Cl) not more than .....0.1000%

F1542

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.htm>

## Perfect Blend, LLC

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**BIOTIC**  
**8-4-5 SGN100 / SGN150**

## Perfect Blend Fertilizer with 14 Essential Elements

Perfect Blend 8-4-5 is designed, when applied correctly, to meet your fertilizer needs.

### Proprietary Process!

Perfect Blend fertilizers are made using a proprietary process that produces a high quality nutrition to soil microbes that are responsible for breaking down minerals for plants while helping to maintain a balanced pH in your soil.

### Mycorrhizal Spore Inoculants

Mycorrhizal fungi are not hazardous to humans and provide great benefits to most turf grasses, plant, shrubs, and trees. Perfect Blend fertilizer is inoculated with a blend of three dormant mycorrhizal spore species, Glomus intraradices, G. aggregatum and G. mosseae at approximately 2.58 propagules per gram total. 100% mycorrhizal strength guaranteed for two years after bag crimp date if product is kept in a dry location at less than 110° F. Fertilizer nutrient values expire after seven years.

### APPLICATION DIRECTIONS

**Established Turfgrass:** Apply as a top dressing for fairways, rough, lawns, greens, landscapes, or on any established grass. Apply 6.25 lbs to 12.5 lbs per 1,000 square feet for application of .5 lb. to 1 lb. of actual nitrogen per 1,000 square feet. The maximum value of these fertilizers is obtained when applied during aeration.

**Ornamentals and Flower Beds:** Apply 1 lb. (Approximately 2 cups) per 25 sq ft. Work into the soil prior to placing flowers or ornamentals. Repeat application when buds bloom and in the late fall before first frost.

**Starter or Grow-Ins:** Apply 12.5 lbs of fertilizer per 1,000 sq. ft. for 1 lb. of nitrogen. Till or rake into the top 2"-4" after surface spreading.

**Bulk Applications:** Apply 625 lbs of fertilizer for each 50 lbs. of nitrogen required. Apply 1,250 lbs. of fertilizer for each 100 lbs. of nitrogen required. Apply 2,500 lbs. of fertilizer for every 200 lbs. of nitrogen required.

#### SPREADER SETTINGS FOR 8-4-5 SGN100

	1/2 LB N	1 LB. N		1/2 LB N	1 LB N
LELY	5-25'	8'-25'	SCOTTS 2000	P/Q	W
LESCO	K/L	0	SCOTTS R8	N/O	U
PRIZELAWN	N	R	VICON	35-25'	48-25'

#### SPREADER SETTINGS FOR 8-4-5 SGN150

	1/2 LB N	1 LB. N		1/2 LB N	1 LB N
LELY	5-25'	8'-25'	SCOTTS 2000	P/Q	W
LESCO	K/L	0	SCOTTS R8	N/O	U
PRIZELAWN	N	R	VICON	35-25'	48-25'

### Guaranteed Analysis

Total Nitrogen (N)	8.00%
1.76% Ammoniacal Nitrogen	
0.04% Nitrate Nitrogen	
3.20% Water Soluble Nitrogen	
3.00% Water Insoluble Nitrogen*	
Available Phosphate (P <sub>2</sub> O <sub>5</sub> )	4.00%
Soluble Potash (K <sub>2</sub> O)	5.00%
Calcium (Ca)	7.0000%
Magnesium (Mg)	0.7000%
0.70% Water Soluble Magnesium (Mg)	
Sulfur (S)	3.0000%
3.00% Combined Sulfur (S)	
Boron (B)	0.0200%
Cobalt (Co)	0.0005%
Copper (Cu)	0.0500%
Iron (Fe)	0.1000%
0.10% Water Soluble Iron (Fe)	
Manganese (Mn)	0.0500%
Molybdenum (Mo)	0.0005%
Sodium (Na)	0.1000%
Zinc (Zn)	0.0500%

#### Derived From:

Chicken Manure, Urea, Anhydrous Ammonia, Cobalt Sulfate, Copper Sulfate, Ferrous Sulfate, Manganese Sulfate, Molybdenum Oxide, Sulfate of Potash, Potassium Chloride, Sulfuric Acid, Boric Acid and Zinc Sulfate.

\* Slow Release Nitrogen from Chicken Manure

#### ALSO CONTAINS NONPLANT FOOD INGREDIENTS

##### Mycorrhizal spore species:

Glomus intraradices 0.86 propagules per gram  
Glomus aggregatum 0.86 propagules per gram  
Glomus mosseae 0.86 propagules per gram

Chlorine (Cl) not more than 0.1000%

F1542

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.htm>

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**BIOTIC**  
**10-3-7 SGN100 / SGN150**

## Perfect Blend Fertilizer with 14 Essential Elements

Perfect Blend 10-3-7 is designed, when applied correctly, to meet your fertilizer needs.

### Proprietary Process!

Perfect Blend fertilizers are made using a proprietary process that produces a high quality nutrition to soil microbes that are responsible for breaking down minerals for plants while helping to maintain a balanced pH in your soil.

### Mycorrhizal Spore Inoculants

Mycorrhizal fungi are not hazardous to humans and provide great benefits to most turf grasses, plant, shrubs, and trees. Perfect Blend fertilizer is inoculated with a blend of three dormant mycorrhizal spore species, Glomus intraradices, G. aggregatum and G. mosseae at approximately 2.58 propagules per gram total. 100% mycorrhizal strength guaranteed for two years after bag crimp date if product is kept in a dry location at less than 110° F. Fertilizer nutrient values expire after seven years.

### APPLICATION DIRECTIONS

**Established Turfgrass:** Apply as a top dressing for fairways, rough, lawns, greens, landscapes, or on any established grass. Apply 5 lbs to 10 lbs per 1,000 square feet for application of .5 lb. to 1 lb. of actual nitrogen per 1,000 square feet. The maximum value of these fertilizers is obtained when applied during aeration.

**Ornamentals and Flower Beds:** Apply 1 lb. (Approximately 2 cups) per 25 sq ft. Work into the soil prior to placing flowers or ornamentals. Repeat application when buds bloom and in the late fall before first frost.

**Starter or Grow-Ins:** Apply 10 lbs of fertilizer per 1,000 sq. ft. for 1 lb. of nitrogen. Till or rake into the top 2"-4" after surface spreading.

**Bulk Applications:** Apply 500 lbs of fertilizer for each 50 lbs. of nitrogen required. Apply 1,000 lbs. of fertilizer for each 100 lbs. of nitrogen required. Apply 2,000 lbs. of fertilizer for every 200 lbs. of nitrogen required.

#### SPREADER SETTINGS FOR 10-3-7 SGN100

	1/2 LB N	1 LB. N		1/2 LB N	1 LB N
LELY	4.5-25'	7-25'	SCOTTS 2000	O/P	U
LESCO	J/K	N/O	SCOTTS R8	M/N	S
PRIZELAWN	K	N	VICON	30-25'	44-25'

#### SPREADER SETTINGS FOR 10-3-7 SGN150

	1/2 LB N	1 LB. N		1/2 LB N	1 LB N
LELY	5-25'	7.75'-25'	SCOTTS 2000	Q/R	X
LESCO	K/L	P/Q	SCOTTS R8	O/P	V
PRIZELAWN	N	L*2	VICON	35-25'	46-25'

### Guaranteed Analysis

Total Nitrogen (N)	10.00%
1.76% Ammoniacal Nitrogen	
0.04% Nitrate Nitrogen	
5.20% Water Soluble Nitrogen	
3.00% Water Insoluble Nitrogen *	
Available Phosphate (P <sub>2</sub> O <sub>5</sub> )	3.00%
Soluble Potash (K <sub>2</sub> O)	7.00%
Calcium (Ca)	7.0000%
Magnesium (Mg)	0.7000%
0.70% Water Soluble Magnesium (Mg)	
Sulfur (S)	3.0000%
3.00% Combined Sulfur (S)	
Boron (B)	0.0200%
Cobalt (Co)	0.0005%
Copper (Cu)	0.0500%
Iron (Fe)	0.1000%
0.10% Water Soluble Iron (Fe)	
Manganese (Mn)	0.0500%
Molybdenum (Mo)	0.0005%
Sodium (Na)	0.1000%
Zinc (Zn)	0.0500%

#### Derived From:

Chicken Manure, Cobalt Sulfate, Copper Sulfate Ferrous Sulfate, Urea, Manganese Sulfate, Molybdenum Oxide, Sulfate of Potash, Potassium Chloride, Sulfuric Acid, Boric Acid & Zinc Sulfate.

\* Slow Release Nitrogen from Chicken Manure

#### ALSO CONTAINS NONPLANT FOOD INGREDIENTS

#### Mycorrhizal spore species:

Glomus intraradices	0.86 propagules per gram
Glomus aggregatum	0.86 propagules per gram
Glomus mosseae	0.86 propagules per gram

Chlorine (Cl) not more than 0.1000%

F1542

Information regarding the contents and levels of metals in this product is available on the internet at <http://www.aapfco.org/metals.htm>

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**BIOTIC**  
**16-3-7 SGN150**

## Perfect Blend Fertilizer with 13 Essential Elements

Perfect Blend 16-3-7 is designed, when applied correctly, to meet your fertilizer needs.

### Proprietary Process!

Perfect Blend fertilizers are made using a proprietary process that produces a high quality nutrition to soil microbes that are responsible for breaking down minerals for plants while helping to maintain a balanced pH in your soil.

### APPLICATION DIRECTIONS

**Established Turfgrass:** Apply as a top dressing for fairways, rough, lawns, greens, landscapes, or on any established grass. Apply 5 lbs to 10 lbs per 1,000 square feet for application of .8 lb. to 1.6 lb. of actual nitrogen per 1,000 square feet. The maximum value of these fertilizers is obtained when applied during aeration.

**Ornamentals and Flower Beds:** Apply .8 lb. (Approximately 2 cups) per 25 sq ft. Work into the soil prior to placing flowers or ornamentals. Repeat application when buds bloom and in the late fall before first frost. Starter or Grow-Ins: Apply 8 lbs of fertilizer per 1,000 sq. ft. for 1 lb. of nitrogen. Till or rake into the top 2"-4" after surface spreading.

**Bulk Applications:** Apply 313lbs of fertilizer for each 50 lbs. of nitrogen required. Apply 626 lbs. of fertilizer for each 100 lbs. of nitrogen required. Apply 1,252 lbs. of fertilizer for every 200 lbs. of nitrogen required.

NITROGEN (lbs)				
0.8 lbs (N)	1.6 lbs (N)	50 lbs (N)	100 lbs (N)	200 lbs (N)
5 lbs	10 lbs	313 lbs	626 lbs	1,252 lbs
Granular Material	Granular Material	Granular Material	Granular Material	Granular Material

SPREADER SETTINGS					
	1/2 LB N	1 LB. N		1/2 LB N	1 LB N
LELY	5-25'	6.75-25'	SCOTTS 2000	N/O	T
LESCO	J/K	O/P	SCOTTS R8	L/M	R
			VICON	26-25'	38-25'

### Guaranteed Analysis

Total Nitrogen (N).....	16.00%
1.76% Ammoniacal Nitrogen	
0.04% Nitrate Nitrogen	
11.20% Urea **	
3.00% Water Insoluble Organic Nitrogen *	
Available Phosphate (P <sub>2</sub> O <sub>5</sub> ).....	3.00%
Soluble Potash (K <sub>2</sub> O).....	7.00%
Calcium (Ca).....	5.0000%
Magnesium (Mg).....	0.5000%
0.50% Water Soluble Magnesium (Mg)	
Sulfur (S).....	1.5000%
1.50% Combined Sulfur (S)	
Boron (B).....	0.0200%
Cobalt (Co).....	0.0005%
Copper (Cu).....	0.0500%
Iron (Fe).....	0.1000%
0.10% Water Soluble Iron (Fe)	
Manganese (Mn).....	0.0500%
Molybdenum (Mo).....	0.0005%
Zinc (Zn).....	0.0500%

### Derived From:

Hydrolyzed Chicken Manure, Urea , Potassium Chloride, Sulfuric Acid, Anhydrous Ammonia, Elemental Sulfur, Ferrous Sulfate, Copper Sulfate, Manganese Sulfate, Zinc Sulfate, Molybdenum Oxide, Boric Acid, Cobalt Sulfate.

\*3.00% Slowly Available Nitrogen from Chicken Manure

\*\*6.00% Nitrogen stabilized with dicyanamide and N-(n-butyl) thiophosphoric triamide (Uflexx \*)

Chlorine (Cl) not more than .....0.1000%

**F1542**

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# Proven Benefits of the Most Advanced, Science-Driven Biotic Fertilizers in the World!

## Provides Soil Microbes the Nutrient Basis to Sustain Soils

The pH-balanced, chelated mineral nutrient base increases protein synthesis and polysaccharides, decreasing disease, destructive fungus and predatory insects.

## Pathogen-Free: All Human Pathogens Eliminated in Three-Step Process

Our unique process uses kinetic, chemical and infrared treatment to eliminate any possibility of human pathogens such as E. coli. Our products are completely free of weed seeds, insect eggs, and insect casements.

## NOP Approved Formulations – Growing Turf to its Full Genetic Potential

### Primary Nutrients

Nitrogen  
Phosphate  
Potash

### Secondary Nutrients

Calcium  
Sulfur  
Magnesium

### Trace Minerals

Boron  
Chlorine  
Cobalt  
Copper  
Iron  
Manganese  
Molybdenum  
Sodium  
Zinc

### Amino Acids

Aspartic Acid  
Theronine  
Serine  
Glutamic Acid  
Proline  
Glycine  
Alanine  
Cystine  
Valine  
Methionine  
Isoleucine  
Leucine  
Tyrosine  
Phenylalanine  
Histidine  
Lysine  
Arginine  
Tryptophan

### Vitamins

B-6  
B-12  
Biotin  
Folic Acid  
Niacin  
Pantothenic Acid  
Riboflavin  
Thiamine  
Vitamin E

### Enzymes

Auxin Group  
Zeatin

### Fish Oils

Omega 3  
Omega 6  
Omega 9  
Eeicosapentaenoic acid (EPA)  
Docosahexaenoic acid (DHA)

## Designed for Maximum Efficiency of Transformation into Soil Acids

6.0–6.1 pH formulation promotes rapid soil microbe growth  
Altered molecular structure of manure base increases efficiency  
Homogenous granules for high-efficiency transformation  
Mycorrhizal inoculants to replenish depleted colonies  
High in amino acids for direct uptake by plants  
High in chelated minerals for direct uptake by plants

