

AGGRAND®

Natural Organic Products
Lawn • Garden • Agriculture

APPLES

Apples respond to foliar and soil applications of AGGRAND fertilizers. Peak foliar responses are obtained on perennial crops such as apples by applying AGGRAND fertilizers after (the leaves open during pre-bloom, post-bloom, and during fruit set. Too much N affects fruit quality and shelf life. While nitrogen (N) is an important nutrient in apple production, apple trees store N from season to season. If leaves are chlorotic after they open in spring then this condition is a symptom of an N deficiency, which may limit production. By changing the foliar spray and soil application rates, type of fertilizer applied and the number of applications the N status of this crop is adjusted.

Foliar Applications;

- 1.) Mix 1-2 gallons of AGGRAND 4-3-3 Natural Fertilizer in 50-100 gallons of water (depending on tree density, spray equipment, and canopy volume). Spray on one acre after the leaves open. After bloom, repeat the AGGRAND 4-3-3 application if the trees require more N.
- 2.) Mix 2-4 qts of AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash with the same volume of water and apply after fruit set
- 3.) Repeat the second application 3-4 weeks before final harvest,

Rates vary according to soil fertility and other inputs used. Lower dilution rates are more effective than higher dilution rates. Two or three applications may be more effective than one heavy application. If other constraints only allow one trip over the field, then do not exceed a 3% dilution rate (3 gallons of AGGRAND to 100 gallons of water)

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in the early morning or late evening. Do not apply before or after rainfall or irrigation. On standard field sprayers, use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

If bitter pit is a problem then add 1-2 gallons of AGGRAND Natural Liquid Lime to the spray tank to supply additional calcium.

To reduce susceptibility to attack of insects and disease causing organisms, apply 1-2 qts of AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash when signs of infestation begin to become apparent. AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/3 to 1/2. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications when they are applied at the same time as pesticides.

Soil Applications:

Mix 3 gallons of AGGRAND 4-3-3 in 20-30 gallons of water. Apply solution to one acre (apply in spring and fall if soil is hard and low in organic matter).

BEANS

Annual leguminous crops such as soybeans and green beans, respond in light preplant soil and foliar applications of fertilizer. Beans may not respond to additions of nitrogen (N), phosphorus (P) and potassium (K), especially under the right soil conditions. Beans are able to modify their own root environment to maximize nutrient uptake especially when the soil pH is 6.0-6.5 and microbes are active in the soil. In addition to these facts, legumes respond to low soil N levels by increasing root nodulation. Symbiotic bacteria in the nodules fix N from the atmosphere so increased nodulation supplies the N necessary for plant growth and development. Make sure that the soil has been inoculated with the correct *Rhizobium* bacteria to maximize nitrogen fixation. Under most soil conditions a preplant application of AGGRAND 4-3-1 Natural Fertilizer in combination with one or two foliar applications of either AGGRAND 4-3-1 or AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash are an adequate supplement. A banded application of AGGRAND 0-12-0 Natural Bonemeal and AGGRAND 4-3-3 may be beneficial on cold wet soils or soil that is low in N, P, or K

Foliar applications;

- 1.) Apply 1-2 gals/acre of AGGRAND 4-3-3 mixed with 30-75 gals. of water as a fine mist with enough solution to thoroughly cover leaves (increase spray volume as crop develops to ensure thorough coverage) If sufficient nitrogen is present (indicated by dark green leaves), then substitute 1-2 qts. of AGGRAND 0-0-8 mixed with 25-50 gals. of water. Apply first application when plants are 3-5" in height.
- 2.) Repeat application 2 to 3 weeks before first bloom when tiny hairs on the terminal leaves give plants a shiny appearance.

On fresh market green beans a third application before the second flush of blooms stimulates the development of pods during late summer and early fall

Rates vary according to soil fertility and other inputs used. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications can be more effective than one heavy application. If other constraints only allow one trip over the field, then do not exceed a 3% dilution rate (3 gals. of AGGRAND to 100 gals. of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard field sprayers use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

To reduce susceptibility to attack of insect and disease causing organisms apply 1 gal of AGGRAND 4-3-3/acre when signs of infestation begin to become apparent. Substitute 2 qts. of AGGRAND 0-0-8 for the 4-3-3 late in the season when the additional nitrogen and phosphorus are not needed or when sufficient nitrogen is present. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications when they are applied at the same times as pesticides

AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/3 to 1/2.

Soil Applications:

Mix 3 gals of AGGRAND 4-3-3 in 20-30 gals. of water. Apply solution to one acre (apply spring and fall if soil is hard and low in organic matter) otherwise one preplant application is sufficient.

BERRIES

Peak foliar responses are obtained on perennial crops such as raspberries and blackberries by applying AGGRAND fertilizer after the leaves open, after bloom, and during fruit fill up to 3 weeks before final harvest.

Root applications: Mix 2-3 gals, of AGGRAND 4-3-3 with 25-50 gals of water and apply to one acre once a month during growing season. Optimize results by adding 1 -2 qts. of 0-0-8 to the mix.

Foliar applications:

- I.) Mix 1 -2 gals. of AGGRAND 4-3-3 with 50-100 gals. of water and apply as a fine mist to one acre after leaves open and again after first bloom.
- 2.) Mix 2-4 qts. of AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash with the same volume of water and apply during fruit formation up to 3 weeks before final harvest.

Rates vary according to soil fertility and other inputs used. Higher dilution rates are more effective than lower dilution rates. Two or three lighter applications may be more effective than one heavy application. If other constraints only allow one trip over the field, then do not exceed a 3% dilution rate (3 gals, of AGGRAND to 100 gals. of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard sprayers use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

To reduce susceptibility to attack of insect and disease causing organisms apply 1 gal. of AGGRAND 4-3-3/acre when signs of infestation begin to become apparent. Substitute 1 qt of AGGRAND 0-0-8 for the 4-3-3 late in the season when the additional nitrogen and phosphorus are not needed. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications on certain pests when they are applied at the same times as pesticides. AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/4 to 1/2.

Soil applications

Mix 2-3 gal. of AGGRAND 4-3-3 in 20-30 gals. of water. Apply solution to one acre in spring or fall (apply spring and fall if soil is hard and low in organic matter). Optimize results by adding 2-3 gals-of AGGRAND 0-12-0 and 1-2 qts. of AGGRAND 0-0-8 to the mix.

CITRUS

Nitrogen is typically the limiting macronutrient in citrus production. One quarter to one-half pound of actual nitrogen per tree per year is recommended when using chemical fertilizers. However, when growing citrus organically only a fraction (5-10%) of that amount needs to be applied because biological activity in the soil fixes nitrogen from the atmosphere and releases nitrogen from organic matter that is applied as compost, cover crops, and AGGRAND fish and kelp products.

Minor nutrient deficiencies are normally the only other disorders necessitating the application of corrective measures. In the majority of cases the application of AGGRAND fertilizers corrects any deficiencies.

Applications of AGGRAND fertilizers stimulate soil biological activity, supply macro and micronutrients, and release nutrients from the soil. When AGGRAND products are applied along with organic matter plant cell structure and soil water holding capacity are improved.

Foliar applications:

The foliar application of AGGRAND fish and kelp fertilizers corrects many micronutrient deficiencies and increases drought, heat, and cold tolerance of citrus. Foliar applications of AGGRAND fertilizers reduce pest problems in citrus production. The foliar application of AGGRAND products as a part of the early bloom, summer and fall spray programs is effective in reducing the number of insect pests.

- 1.) Mix 1-2 gallons AGGRAND 4-3-3 with 50-100 gals. of water. Apply as a fine mist with enough solution to thoroughly cover leaves. Apply with pre-bloom, post-bloom, and summer sprays. Optimize results by adding 1-2qts. of AGGRAND 0-0-8 to the mix.
- 2.) Mix 1-2 qts. of AGGRAND 0-0-8 in 50-100 gals, of water. Apply with fall spray and 1-2 months before harvest (pit-harvest application increases the shell-life of fruit).

The addition of fulvic acid increases penetration of the leaf cuticle. Add 1-2 pints to the spray tank along with the fertilizer. Use 1 pint when applying AGGRAND 4-3-3 and 0-0-8 products together.

Rates vary according to soil fertility and other inputs used. Higher dilution rates are more effective than lower dilution rates. Do not exceed a 3% dilution rate (3 gals. of AGGRAND to 100 gals. of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard sprayers use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

Soil applications:

Apply 2-3 gals. AGGRAND Natural fertilizer 4-3-3 diluted in 20-30 gals. of water. Apply to 1 acre with a field sprayer in spring and fall.

The addition of a biological activator increases soil biological activity. Add activator to The spray tank or irrigation water along with the fertilizer

Root applications:

Apply with irrigation water 2-4 times per month between pre-bloom period to one month after harvest (apply more often on lighter soils with low organic matter content). When applying AGGRAND with irrigation water use a dilution rate that results in 6-20 gals./acre/year.

Central applications:

- 1.) Apply ½ - 1 ½ quarts per tree per year or 12-45 gals./acre/year (rates depend on tree population, soil fertility, and the use of cover crops and/or application of compost or manure). The total amount includes soil and foliar applications.

The application of compost, composted manure, and incorporation of green manure crops improves soil structure, nutrient, and water holding capacity of desert soils. Annual medics (*medicago spp*) such as barrel medic (*medicago tuncatula*) strand medic (*m. littoralis*) and snail medic (*m. scutellata*) are low growing and adapted to neutral to alkaline soils. These species will grow during the cool season and go to seed before summer. They add organic matter and nitrogen to the soil. They must be kept short by mowing to 3-5" in height.

Organic Citrus Production in Desert Climates

Soil Factors:

Coarser textured soils with good drainage produce the highest yields, but citrus production is also possible with finer textured soils with good drainage.

If there is irrigation available, foliar applications can be applied through the irrigation system whether it is

- 1) center pivot 2) wheeled 3) gun or 4) drip.

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf

surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard field sprayers use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

To reduce susceptibility to attack of insect and disease causing organisms apply 1 gal. of AGGRAND 4-3-3/acre when signs of infestation begin to become apparent. AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/3 to 1/2. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications when they are applied at the same times as pesticides.

CORN

Corn is a heavy feeder and requires large amounts of nutrients, especially Nitrogen (N) and Phosphorus (P). N is usually the limiting factor in corn production throughout the season and P and Potassium (K) are important during early plant growth, and development when soil conditions limit their uptake, All types of com respond to AGGRAND fertilizers when they are applied in banded applications at planting and as foliar applications after emergence.

Banded Applications;

Apply 2-3 gallons/acre of AGGRAND 4-3-3 Natural Fertilizer at planting. The addition of 1-2 gallons/acre of AGGRAND 0-12-0 Liquid Bonemeal along with the 4-3-3 may also be beneficial especially when phosphorus soil test levels are below 30 ppm.

Foliar Applications:

- 1) Apply 1-3 gallons/acre of AGGRAND 4-3-3 mixed with 30-75 gallons of water as a fine mist with enough solution to thoroughly cover leaves (increase spray volume as crop develops to ensure thorough coverage.) Apply first application when plants are 4-6" in height.
- 2) Repeat application when plants are; 18-24" tall Increase the application rate if leaves are chlorotic.
- 3.) A third application is applied when a few tassels are just starting to show, but this application can only be applied by aircraft, a high-boy, or through an irrigation system. Another option is to apply AGGRAND when plants are 4-6" tall. 10-12" tall, and before the crop is too tall to enter the field (18-24" tall). Space the applications at least 10 days apart.

Rates vary according to soil fertility, cropping history, and other inputs that are available. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications may be more effective than one heavy application. If other constraints only allow one trip over the field, then do not exceed 4% dilution rate (4 gallons of AGGRAND to 100 gallons of water).

CUCUMBERS

For cucurbbers AGGRAND fertilizer is most effective when applied at planting or transplanting, 3-4" in height, runnering, 1st bloom, and several weeks before final harvest. If it is being used in conjunction with a standard fertilizer program, apply after emergence and at runnering to increase yield, and drought, heat, and cold tolerance of the crop. Otherwise apply AGGRAND at all of the developmental stages mentioned above

Foliar applications:

- 1.) Apply 1-3 gals, per acre mixed in 30-50 gals, of water as a line mist with enough solution to cover leaves (increase spray volume as crop develops to ensure thorough coverage). Apply first application when plants are 3-5" in height.
- 2.) Repeat application when plants begin to run. Increase the application rate if leaves are chlorotic
- 3.) Depending on other inputs used plants may respond to another AGGRAND 4-3-3 application at first bloom
- 4.) To extend the season for fresh market encumbers apply AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash late in the season up to 3 weeks before final harvest. Mix 2-4 qts of AGGRAND 0-0-8 in 30-50 gals of water. Apply as a fine mist with enough solution to cover leaves.

Rates vary according to soil fertility and other inputs used. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications may be more effective than one heavy application. If other constraints only allow one trip over the field, then do not exceed a 4% a dilution rate (4 gals. of AGGRAND to 100 gals. of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard field sprayers use turbo Hood jet nozzles when applying ACGRAND to reduce clogging.

To reduce susceptibility to attack of insect and disease causing organisms apply 1 gal. of AGGRAND 4-3-3/acre when signs of infestation begin to become apparent. AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/3 to 1/2. Some growers are finding trial AGGRAND applications alone eliminate the need for pesticide applications when they are applied at the same times as pesticides.

Apply 2-3 gals. AGGRAND Natural fertilizer 4-3-3 diluted in 20-30 gals. of water. Apply solution to one acre (apply spring and fall if soil is hard and low in organic matter).

GARLIC

Garlic responds to a banded preplant application of AGGRAND fertilizers, with regular subsequent applications at the two critical stages of growth: emergence and just prior to bulbing. Once bulbing has begun additional fertilizer has no significant effect. AGGRAND Natural Liquid Lime can be amended to the final application when renditions call for extra calcium.

Handed applications:

Mix 2-3 gals, of AGGRAND 4-3-3 Natural Fertilizer, 2-3 gals, of AGGRAND 0-12-0 Natural Liquid Bonemeal, and 1 gal. of AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash in 20-40 gallons of water. Apply to one acre in a band near the row prior to planting in the fall

Soil applications:

1. At emergence mix 3-6 gals, of AGGRAND 4-3-3 in 20-40 gals, of water and apply to the soil on one acre.
2. Just prior to bulbing (about 1 month after emergence) mix together 2-3 gals, AGGRAND 4-3-3, 1 gal. of AGGRAND 0-0-8, and if needed, 1-3 gals. of AGGRAND Natural Liquid Lime in 20-40 gals. of water and apply to one acre.

Apply AGGRAND in early morning or late evening Do not apply before rainfall or irrigation. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications on certain pests when they are applied at the same time as pesticides.

HAY AND PASTURE

Mixed grass-legume production as it relates to permanent cultures on acid clay soils in the eastern U.S. and Pacific Northwest has special fertility requirements. These soils tend to contain high to excessive amounts of magnesium (Mg) and low to deficient amounts of calcium (Ca), The percentages of Mg and Ca must be adjusted to increase soil aeration allowing higher levels of biological activity to increase and sustain high productivity levels (the biology follows the chemistry).

In general, one ton of gypsum and one ton of high Ca lime applied per acre during field renovation increase aeration and improve drainage on clay soils for several years. After gypsum is tilled into the soil, irrigate or allow several inches of rain to fall to leach the Mg from the soil before applying lime. Some farmers are finding out that the soil chemistry stays in balance with very little change over longer periods (10 years or more) when AGGRAND fertilizers are used in conjunction with the balancing of soil chemistry.

Foliar applications:

- 1.) Mix 1-3 gals. AGGRAND 4-3-3 Natural fertilizer, 1-2 gals. AGGRAND Natural Liquid Bonemeal and 1-2 qts. AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash with 50-75 gal. of water. Apply as a fine mist with enough solution to thoroughly cover leaves. Apply first application in spring when plants are 4-6" in height.
- 2.) Repeat application when crop begins to regrow (4-6" in height) after each culling or grazing (on rotationally grazed pastures).
- 3.) Apply 2-3 applications per year.

Rates vary according to soil fertility, cropping history, and other inputs that are applied. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications may be more effective than one or two heavier applications. If other constraints allow only one trip over the field, then do not exceed a 3% dilution rate (3 gals. AGGRAND to 100 gals, of water).

The addition of a biodegradable surfactant increases uptake by promoting adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard field sprayers use turbo flood jet or flood jet nozzles when applying AGGRAND to reduce clogging and increase atomization.

To reduce susceptibility to attack of insects and disease causing organisms, apply 1-2 gals. of 4-3-3 or 1-2 qts. Of 0-0-8/acre when signs of infestation begin to become apparent. When AGGRAND is added to the spray tank it reduces the pesticide needed to obtain effective control by 1/3 to 1/2. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications when they are applied at the same times as pesticides.

Preplant soil applications:

Mix 3-6 gals. AGGRAND 4-3-3 with 20-30 gals. of water. Apply solution after seedbed preparation. Drag lightly after application.

TOBACCO

Tobacco responds to AGGRAND applications in the greenhouse, at transplanting, and at lay-by. Nitrogen (N) is a critical nutrient in tobacco production. Too much N late in the season causes suckering which produces tobacco of unequal quality. Too little N causes reductions in yield. N levels need to be adjusted to control yield and crop quality

Foliar Applications

- 1.) Apply AGGRAND 4-3-3 Natural Fertilizer to tobacco as a foliar spray to starts in the greenhouse when the tobacco reaches 3-5" in height with a 2% solution (2.5 oz fertilizer/gal of water). Apply enough fertilizer tea to wet the foliage. Better results may be obtained by repeating the application in 10 days while in the greenhouse, use a 1% solution (1.25 oz fertilizer/gal of water) when splitting the application into two treatments. Plants need to be set out in the field before they become rootbound.
- 2.) If the crop appears to be chlorotic by the time of lay-by (2 ft. tall), it may be beneficial to apply a field application at the same rate onto the foliage. The field application may not be beneficial on some tobacco when it is harvested all at once because some suckering can occur, but on tobacco which is picked selectively the additional suckering may not be problematic. Apply 1-3 gals/acre of AGGRAND 4-3-3 in 25-75 gals of water as a fine mist with enough solution to thoroughly cover leaves (increase spray volume as crop develops to ensure thorough coverage).

Rates vary according to soil fertility and other inputs used. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications can be more effective than one heavy application. If other constraints only allow one nip over the field, then do not exceed 4% a dilution rate (4 gals of AGGRAND to 100gals. of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On Standard field sprayers, use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

To reduce susceptibility to attack of insect and disease causing organisms apply 1 gal. of AGGRAND 4-3-3/acre when signs of infestation begin to become apparent. Substitute 2 qts. Of AGGRAND 0-0-8 Natural Kelp sulfate of Potash for the AGGRAND 4-3-3 after lay-by when the additional nitrogen could be detrimental. AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/3 to 1/2. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications when they are applied at the same times as pesticides

Root Applications:

When transplanting into the field apply AGGRAND 4-3-3 at 2-3 gals /acre Mix the fertilizer with 100 to 150 gallons of water. Rates vary according to soil fertility and other inputs used. When applying fertilizer to bare roots do not exceed 2% dilution

Soil Applications:

Mix 3 gals of AGGRAND 4-3-3 in 20-30 gals. of water. Apply solution to one acre (apply spring and fall if soil is hard and low in organic matter).

POTATOES

Potatoes respond to AGGRAND fertilizers when they are applied in banded applications at planting and as foliar applications after emergence

Banded Applications:

Apply 2-3 gallons/acre of AGGRAND 4-3-3 Natural Fertilizer Near the seed at planting. The addition of 1-2 gallons of AGGRAND 0-12-0 Liquid Bonemeal along with the 4-3-3 may also be beneficial especially when phosphorus soil test levels are below 40 ppm.

Foliar Applications:

Apply 1-3 gallons/acre of AGGRAND 4-3-3 mixed with 30-50 gallons of water as a fine mist with enough solution to thoroughly cover the leaves (increase spray volume as canopy develops to ensure thorough coverage). Apply foliar applications in 10, 40, and 60 days after emergence.

Rates vary according to soil fertility and other inputs used. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications may be more effective than one heavy application. If other constraints allow only one trip over the field, then do not exceed a 4% dilution rate (4 gallons of AGGRAND to 100 gallons of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening do not apply before or after rainfall or irrigation. On standard field sprayers, use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

To reduce susceptibility from the attack of insects and disease causing organisms, apply 1 gallon of AGGRAND 4-3-3/acre when signs of infestation begin to become apparent. Substitute 2 qts of AGGRAND 0-0-8 Kelp and Sulfate of Potash for the 4-3-3 late in the season when the additional nitrogen is not needed. AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/3 to 1/2. Sonic growers are finding that AGGRAND applications alone eliminate the need for pesticide applications when they are applied at the same time as pesticides.

Soil applications:

Mix 3 gals. of AGGRAND 4-3-3 in 20-30 gals, water. Apply solution to one acre (apply in spring and fall if soil is hard and low in organic matter).

SOYBEANS

Annual leguminous crops such as soybeans and green beans respond to light preplant soil and foliar applications of fertilizer. Beans may not respond to additions of nitrogen (N), phosphorus (P) and potassium (K.), especially under the right soil conditions. Beans are able to modify their own root environment to maximize nutrient uptake, especially when the soil pH is 6.0-6.5 and microbes are active in the soil. In addition to these facts, legumes respond to low- soil M levels by increasing root nodulation. Symbiotic bacteria in the nodules fix N from the atmosphere so increased nodulation supplies the N necessary for plant growth and development. Make sure that the soil has been inoculated with the correct *Rhizobium* bacteria to maximize nitrogen fixation. Under most soil conditions a preplant application of AGGRAND 4-3-3 in combination with one or two foliar applications of either AGGRAND 4-3-3 OR AGGRAND 0-0-8 are an adequate supplement. A banded application of AGGRAND 0-12-0 and/or AGGRAND 4-3-3 may be beneficial on cold wet soils or soils that are low in N, P, or K.

Root applications: Mix 1-2 qts of AGGRAND 0-0-8 and 1-2 gals of AGGRAND 0-12-0 with 25-50 gals, of water and apply to one acre once a month.

Foliar applications:

- 1.) Mix 1-2 gals. of AGGRAND 4-3-3 with 40-80 gals. of water. Apply as a fine mist with enough solution to thoroughly cover leaves (increase spray volume as crop develops to ensure thorough coverage). If sufficient nitrogen is present (indicated by dark green leaves), then substitute 1-2 qts. of AGGRAND 0-0-8 mixed with 20-40 gals, of water. Apply first application when plants are 3-5" in height.
- 2.) Repeat application 2 to 3 weeks before first bloom when tiny hairs on the terminal leaves give plants a shiny appearance.
- 3.) On fresh market green beans a third application before the second flush of blooms stimulates the development of pods during late summer and early fall.

Rates vary according to soil fertility and other inputs used. Higher dilution rates are more effective than lower dilution rates. Two or three lighter applications may be more effective than one heavy application. If other constraints only allow one trip over the field, then do not exceed a 3% dilution rate (3 gals, of AGGRAND to 100 gal. of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard field sprayers use turbo flood jet nozzles when applying AGGRAND to reduce clogging.

To reduce susceptibility to attack of insect and disease causing organisms apply 1 qt of AGGRAND 0-0-8/acre when signs of infestation begin to become apparent. Some growers are finding that AGGRAND applications alone eliminate the need for pesticide applications on certain pests when they are applied at the same times as pesticides

AGGRAND added to the spray tank reduces the pesticide needed to obtain effective control by 1/4 to 1/2.

Soil applications:

Mix 2-3 gals, of AGGRAND 4-3-3 in 20-30 gals, of water. Apply solution to one acre in spring or fall (apply spring and fall if soil is hard and low in organic matter) otherwise one preplant application is sufficient. Optimize results by adding 2-3 gals, of AGGRAND 0-12-0 and 1-2 qts. of AGGRAND 0-0-8 to the mix.

GREENHOUSE TOMATO PRODUCTION

Greenhouse tomato production requires sufficient levels of macro and micronutrients to set fruit. Calcium (Ca) and potassium (K) are especially critical. Insufficient levels of these nutrients produce diseased plants and poor quality fruit.

Development of an organic system that stimulates rapid early growth and development is critical. The addition of a biological activator, aerobically composted (or other material), worm castings, or used potting mix inoculate the media with microorganisms. The microbes convert natural fertilizer nutrients and fix atmospheric nitrogen into plant available nutrients which speeds plant growth and development.

Planting Mix:

- 1.) Mix peat moss, perlite, and coarse vermiculite in a 2:1:1 ratio.
- 2.) Substitute sandy loam, pumice, compost, castings, and etc. for part or all of the vermiculite.
- 3.) Add 5 lbs of high calcium lime and 2.5 lbs of dolomite lime to one cubic yard of mix.
- 4.) Soak the media with enough water to thoroughly wet the peat moss. Mix 1 gallon of AGGRAND Natural Liquid Lime, and 1 qt. of AGGRAND 4-3-3 Natural Fertilizer with the water and add to one cubic yard of mix. Use a wetting agent to aid in wetting the mix. Add a biological activator to further stimulate biological activity.
- 5.) Up to 1/3 used mix maybe substituted for new mix. Blend them together after steps 1-4 are complete. Allow the mix to sit for several weeks before planting.

Soil Applications: Once seedlings have emerged and have developed 2-3 true leaves then begin fertilizing the soil. AGGRAND can be applied through greenhouse injection or mixed in a bucket and applied with a watering can. Rates are given for weekly applications. Adjust rates accordingly when applying more or less often.

- 1.) Mix 1.5 oz. AGGRAND 4-3-3, 1 oz. AGGRAND 0-12-0 Natural Liquid Bonemeal, and 0.5 oz. AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash with 1 gallon of water. Apply 1 cup of solution to each gallon of media.
- 2.) Keep well watered between fertilizations. Leach the media with plenty of fresh water every 8 weeks or at least once during the growing cycle.

Foliar Applications:

AGGRAND 4-3-3 can be applied to the leaves of greenhouse tomatoes to supply additional nutrients. Mix 1-2 oz. AGGRAND 4-3-3 with 1 gallon of water and apply as a fine mist to the tops and bottoms of the leaves. Apply enough solution to wet the leaf surfaces. Apply in 14-21 day intervals after the plants reach 2-3 true leaves. The critical stages for foliar applications are: 2-3 true leaves, pre-bloom, and early cluster formation.

Rates vary according to other inputs that are applied. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications may be more effective than one or two heavier applications. If other constraints only allow one application then do not exceed a 3% dilution rate (3 oz. of AGGRAND to 1 gal. of water).

The addition of a biodegradable surfactant increases uptake by promoting adhesion to the leaf surface. Apply AGGRAND in the early morning or late evening.

To reduce susceptibility to attack of insects and disease causing organisms foliar, apply 2 oz. of AGGRAND 4-3-3 or 1 oz. of AGGRAND 0-0-8 mixed in 1 gal. of water when signs of infestation begin to become apparent.

FIELD TOMATO PRODUCTION

Field tomatoes require sufficient levels of macro and micronutrients to set fruit. Calcium (Ca), and potassium (K), and nitrogen (N) are especially critical. Insufficient levels of these nutrients produce diseased plants and poor quality fruit. The application of AGGRAND products, biological activators, and/or aerobically composted manure (or other material), inoculates the soil with microorganisms. The microbes convert natural fertilizer nutrients and fix atmospheric nitrogen into plant available nutrients which speeds plant growth and development.

Soil Applicants:

Once seedlings have emerged and have developed 2-3 true leaves, begin fertilizing the soil. When planting transplants, water the plants with fertilizer solution. Rates are given for monthly applications. Adjust rates accordingly when applying more or less often.

- 1.) Mix 2-3 gallons AGGRAND 4-3-3 Natural Fertilizer, 2-3 gallons AGGRAND 0-12-0 Natural Liquid Bonemeal, and 1-2 qts. AGGRAND 0-0-8 Natural Kelp and Sulfate of Potash with at least 100 gallons of water. Apply solution to one acre.

- 2.) Keep well watered between fertilizations.

Banded Soil Applications:

Mix 3-4 gallons AGGRAND 4-3-3 with 6-10 gallons of water (use enough water to allow correct flow rate through the micro tubing). Apply below and to the side of the seed or transplants at planting. Apply solution to one acre. The addition of 1-2 gallons of AGGRAND 0-12-0 and 2-4 qts of AGGRAND 0-0-8 along with 4-3-3 may also be beneficial especially when phosphorus soil test levels are below 40 ppm and potassium soil test levels are below 150 ppm.

Pre-Plant Soil Applications:

Mix 3-6 gallons of AGGRAND 4-3-3 in 20-30 gallons of water. Apply solution to one acre (apply spring and fall if soil is hard and low in organic matter).

Foliar Applications:

AGGRAND 4-3-3 can be applied to the leaves of tomatoes to supply additional nutrients. Mix 1-3 gallons of AGGRAND 4-3-3 with 50-100 gallons of water and apply as a fine mist to the tops and bottoms of leaves. Apply enough solution to wet the leaf surfaces. Apply in 14-21 day intervals after the plants reach 2-3 true leaves. The critical stages for foliar applications are 2-3 true leaves; pre-bloom, and early cluster formation.

Rates vary according to other inputs that are applied. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications may be more effective than one or two heavier applications. If other constraints allow only one application, then do not exceed a 3% dilution rate (3 gallons of AGGRAND to 100 gallons of water).

The addition of a biodegradable surfactant increases uptake by increasing adhesion to the leaf surface. Apply AGGRAND in early morning or late evening. Do not apply before or after rainfall or irrigation. On standard field sprayers, use turbo flood jet nozzles when applying AG GRAND to reduce clogging.

WETLAND RICE

Rice requires Adequate amounts of N, P, and K to produce acceptable yields. The basal application of all three nutrients at transplanting ensures crop establishment. In addition to this initial application, N should be applied during tillering and panicle primordia formation through panicle emergence (boot stage into heading).

Too much N at one time can cause lodging and reduce grain quality. Rice responds to the gradual release of N through the decomposition of organic matter. The use of green manures, or composted manure, and AGGRAND supply N slowly as the rice crop needs then. The addition of another N source (up to 50 lbs.) will increase yields especially when there isn't enough organic matter.

Root applications:

1. Apply 1-2 gals. of AGGRAND 4-3-3. 1-1.5 gals. of AGGRAND 0-12-0. and 2-4 qts. of AGGRAND 0-0-8 per acre mixed in 30-60 gals. of water during transplanting.
2. If the field is drained between tillering and panicle formation, apply another 1-2 gals of AGGRAND 4-3-3 per acre mixed in 30-60 gals of water with spray equipment.

Rates vary according to soil fertility find other inputs used. Lower dilution rates are more effective than higher dilution rates. Two or three lighter applications may be more effective than one heavy application. If other constraints only allow one trip over the field, then do not exceed a 4% dilution rate (4 gals. of AGGRAND to 100 gals of water) when applying AGGRAND to the foliage.

Soil applications

Mix 3 gals. of AGGRAND 4-3-3 in 70-30 gals. of water. Apply solution to one acre. Till fertilizer into the soil by itself or spray onto compost, manure, or green manure and incorporate into the soil. Apply in spring and fall if soil is hard and low in organic matter.