

AGGRAND[®]

Crop Guide

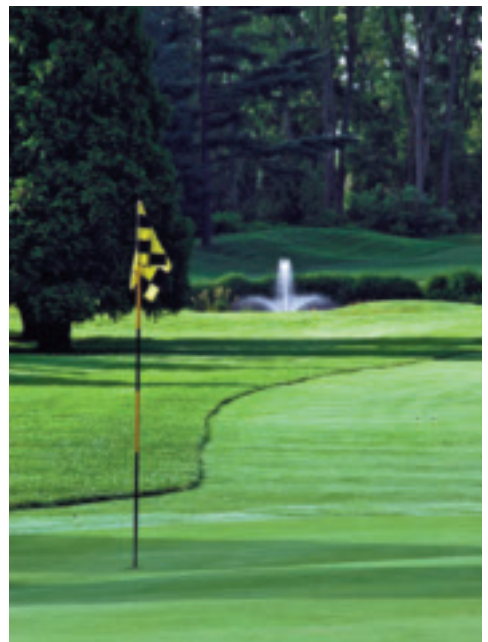
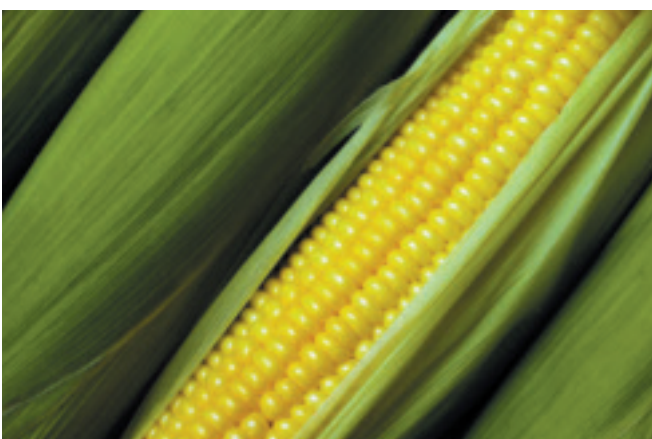


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The AGGRAND Crop Guide provides *general guidelines* for the application of AGGRAND fertilizers on a variety of crops. Each growing scenario is unique and there is no way to account for different soil types, regional weather patterns, crop varieties or other factors specific to individual situations, so a one-size-fits-all recommendation does not ensure maximum results. To obtain the most comprehensive understanding of the nutrient levels and crop requirements of a particular soil, AGGRAND recommends conducting a soil analysis before determining a fertilization program. Soil Analysis Kits (G1374) are available from AGGRAND at a nominal cost. Samples are analyzed at an independent laboratory and the results are shared with the AGGRAND Technical Department. AGGRAND staff will analyze the results and contact the customer to provide custom fertilization program recommendations.

General Field Application Tips

AGGRAND products should be diluted with water prior to application. Once diluted, the mixed product should be applied immediately. Do not store diluted fertilizer for more than 48 hours. All AGGRAND products are filtered at the point of manufacture; however, AGGRAND products are liquid suspensions and some settling will occur. Agitation prior to addition to the spray tank and any in-tank agitation are beneficial. Routine maintenance is required with most spray nozzles, whether they are commercial-grade or designed for homeowners, due to clogging caused by the products applied, contaminants in the water, mineral buildup, sand, sediment and other debris.

For best performance, select nozzles that deliver coarse to extra-coarse droplet size. Coarse droplets lend themselves well to AGGRAND products and reduce the tendency for product applications to drift into unintended areas. To reduce spray nozzle clogging in field, backpack or handheld sprayers, remove the screen(s) from just before the end of the nozzle. AGGRAND recommends the following TeeJet® Technologies spray nozzles for field sprayers: XR TeeJet; Turbo FloodJet and StreamJet Series 7.5, 5 and 4. Always consult the manufacturer's recommendations in the unit's owner's manual.

In foliar applications, the addition of a biodegradable surfactant can improve results by increasing adhesion to the leaf surface. For best results apply AGGRAND fertilizers out of direct sun in early morning or late evening. Do not apply before or after rainfall or irrigation.

APPLES

Apples respond well to foliar and soil applications of AGGRAND fertilizers. Peak foliar responses are obtained on perennial crops, including apples, by applying AGGRAND fertilizers after the leaves open during pre-bloom, during post-bloom and during fruit set. While nitrogen is an important nutrient in apple production, apple trees store nitrogen from season to season and too much nitrogen affects fruit quality and shelf-life. On the other hand, nitrogen deficiency may limit production. One symptom of nitrogen deficiency is when a tree's leaves are chlorotic after they open in spring. Find the right balance of nitrogen in apple trees by adjusting the foliar spray and soil application rates, type of fertilizer applied and the number of applications.

Foliar Applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 50 gallons of water (depending on tree density, spray equipment and canopy volume). Apply after the leaves open. Repeat after bloom if the trees require more nitrogen.

2 quarts AGGRAND Natural Kelp and Sulfate of Potash and 50 gallons of water. Apply after fruit set. Repeat 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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 quart AGGRAND Natural Kelp and Sulfate of Potash and 50 gallons of water when signs of infestation become apparent.

Soil Applications

Per-acre mix ratio:

3 gallons AGGRAND Natural Fertilizer and 30 gallons of water. Apply in spring and fall if soil is hard and low in organic matter. If bitter pit is a problem, add 1 gallon of AGGRAND Natural Liquid Lime to the spray tank to supply additional calcium.



BEANS

Annual leguminous crops such as soybeans and green beans respond to light pre-plant soil and foliar fertilizer applications. Beans may not respond to additions of nitrogen, phosphorus and potassium, especially in certain 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, legumes respond to low soil nitrogen levels by increasing root nodulation. Symbiotic bacteria in the nodules fix nitrogen from the atmosphere, so increased nodulation supplies the nitrogen necessary for plant growth and development. Make sure the soil has been inoculated with the correct Rhizobium bacteria to maximize nitrogen fixation. Under most soil conditions a pre-plant application of AGGRAND Natural Fertilizer in combination with one or two foliar applications of either AGGRAND Natural Fertilizer or AGGRAND Natural Kelp and Sulfate of Potash is an adequate supplement. A banded application of AGGRAND Natural Liquid Bonemeal or AGGRAND Natural Fertilizer may be beneficial on cold, wet soils or soils that are low in nitrogen, phosphorus or potassium.

Root applications

Per-acre mix ratio:

1 quart AGGRAND Natural Kelp and Sulfate of Potash, 1 gallon AGGRAND Natural Liquid Bonemeal and 25 gallons of water. Apply once a month.

Foliar applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 40 gallons 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), substitute 1 quart AGGRAND Kelp and Sulfate of Potash and 20 gallons of water. Perform first application when plants are 3-5" in height.

Repeat two to three weeks before first bloom when tiny hairs on the terminal leaves give plants a shiny appearance.

A third application to fresh-market green beans 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, do not exceed a 3 percent dilution rate (3 gallons of AGGRAND fertilizers to 97 gallons of water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 quart AGGRAND Natural Kelp and Sulfate of Potash and 20 gallons of water when signs of infestation become apparent.

Soil applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 40 gallons of water. Apply solution in spring or fall. Apply in spring and fall if soil is hard and low in organic matter, otherwise one pre-plant application is sufficient. Optimize results by adding 2 gallons AGGRAND Natural Liquid Bonemeal, 2 quarts AGGRAND Kelp and Sulfate of Potash and another 40-50 gallons of water to the mix.



BERRIES

Peak foliar responses can be obtained on perennial crops such as raspberries by applying AGGRAND Natural Fertilizer after the leaves open, after bloom and during the period from fruit fill-up to three weeks before final harvest.

Root Applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 50 gallons of water. Apply once a month during growing season. Optimize results by adding 1 quart AGGRAND Kelp and Sulfate of Potash to the mix.

Foliar Applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 50 gallons of water. Apply as a fine mist after leaves open and again after first bloom.

2 quarts AGGRAND Natural Kelp and Sulfate of Potash and 50 gallons of water. Apply during fruit formation up to three 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, do not exceed a 3 percent dilution rate (3 gallons of AGGRAND fertilizers to 97 Gallons of water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer and 50 gallons of water when signs of infestation become apparent. Substitute 1 quart AGGRAND Kelp and Sulfate of Potash for the Natural Fertilizer late in the season when the additional nitrogen and phosphorus are not needed.

Soil Applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 50 gallons of water. Apply in spring or fall. Apply in spring and fall if soil is hard and low in organic matter. Optimize results by adding 2 gallons AGGRAND Liquid Bonemeal, 1 quart AGGRAND Kelp and Sulfate of Potash and 25 gallons of water to the mix.



CITRUS

Nitrogen is typically the limiting macronutrient in citrus production. One-quarter to one-half pound of nitrogen per tree, per year is recommended when using chemical fertilizers. However, when growing citrus organically only a fraction (5-10 percent) of that amount is required 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 products. Minor nutrient deficiencies are normally the only other disorders necessitating corrective measures and they are usually corrected with proper fertilization.

Foliar Applications

Foliar application of AGGRAND fertilizers can correct many micronutrient deficiencies and increase citrus crops' tolerance of drought, heat and cold. When done as a part of the early bloom, summer and fall spray programs, foliar application of AGGRAND fertilizers is often effective in reducing the number of insect pests.

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 40 gallons of water. Apply as a fine mist with enough solution to thoroughly cover the leaves. Apply with pre-bloom, post-bloom and summer sprays. Optimize results by adding 1 quart AGGRAND Kelp and Sulfate of Potash to the mix.

To increase the shelf-life of fruit, apply a per-acre mixture of 1 quart AGGRAND Kelp and Sulfate of Potash and 25 gallons of water one to two months before harvest.

To increase penetration of the leaf cuticle, add 1 pint fulvic acid to the spray tank along with the fertilizer and Kelp and Sulfate of Potash.

Rates vary according to soil fertility, cropping history 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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons of water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon of AGGRAND Natural Fertilizer and 20 gallons of water when signs of infestation become apparent.

Soil Applications

Per-acre mix ratio:

2-3 gallons AGGRAND Natural Fertilizer and 50-75 gallons of water. Apply in spring and fall.

Root Applications

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



General Applications

Apply 0.5-1.5 quarts per tree, per year or 12-45 gallons per acre, per year (rates depend on tree population, soil fertility and the use of cover crops and application of compost or manure). The total amount includes soil and foliar applications.

The application of compost and composted manure and the incorporation of green manure crops improves soil structure and nutrient- and water-holding capacity of desert soils. Annual medics (medicago spp) such as barrel medic (medicago truncatula), 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 and 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.

CORN

Corn is a heavy feeder and requires large amounts of nutrients, especially nitrogen and phosphorus. Nitrogen is usually the limiting factor in corn production throughout the season while phosphorus and potassium are important during early plant growth and development when soil conditions limit uptake. Corn responds best to AGGRAND fertilizers when they are applied in banded applications at planting and as foliar applications after emergence.

Banded Applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 50 gallons of water. Apply at planting. The addition of 1 gallon AGGRAND Liquid Bonemeal may be beneficial, especially when soil phosphorus levels are below 30 ppm.

Foliar Applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 30 gallons of water. Apply as a fine mist with enough solution to thoroughly cover leaves. Increase spray volume as crop develops to ensure thorough coverage. Perform first application when plants are 4-6" tall.

Repeat when plants are 18-24" tall. Increase the application rate if leaves are chlorotic. A third application could be performed 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 Natural Fertilizer when plants are 4-6" tall, 10-12" tall and before the crop is too tall to enter the field (18-24"). Space the applications at least 10 days apart.

Rates vary according to soil fertility, cropping history 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, do not exceed a 4 percent dilution rate (4 gallons AGGRAND fertilizers to 96 gallons of water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon of AGGRAND Natural Fertilizer and 25 gallons of water when signs of infestation become apparent.

Soil Applications

Per-acre mix ratio:

3 gallons AGGRAND Natural Fertilizer and 75-100 gallons of water. Apply in spring and fall.



COTTON

Cotton is a heavy feeder and requires large amounts of nutrients, especially phosphorus. Phosphorus is usually the limiting factor in cotton production through early boll formation, but nitrogen and potassium are important during early plant growth and development when soil conditions limit their uptake. The addition of nitrogen along with phosphorus applications optimizes crop response, but too much nitrogen during late vegetative growth may inhibit and delay boll formation. The addition of potassium increases disease tolerance and produces higher-quality lint. Cotton responds best to AGGRAND fertilizers when they are applied in pre-plant broadcast applications, banded applications at planting and as foliar and root applications after emergence.

Broadcast Applications

Per-acre mix ratio:

3 gallons AGGRAND Natural Fertilizer and 40 gallons of water. Apply in spring or fall. Apply in spring and fall if soil is hard and low in organic matter.

Banded Applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer, 1 gallon AGGRAND Natural Bonemeal, 1 quart AGGRAND Natural Kelp and Sulfate of Potash and 30 gallons of water.

Foliar Applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer, 2 gallons Aggrand Natural Bonemeal, 1 quart AGGRAND Natural Kelp and Sulfate of Potash and 100 gallons of water. At 4-6" in height, apply as a fine mist with enough solution to thoroughly cover leaves (increase spray volume as crop develops to ensure thorough coverage).

If more nitrogen is needed at pre-bloom, apply 1 gallon AGGRAND Natural Fertilizer, 2 gallons AGGRAND Liquid Bone-meal, 1 quart AGGRAND Kelp and Sulfate of Potash and 100 gallons of water.

If less Nitrogen is needed at pre-bloom, apply 2-3 gallons AGGRAND Liquid Bonemeal, 1 quart Kelp and Sulfate of Potash and 75 gallons of water. If irrigation is available, foliar applications can be applied through the irrigation system whether it is a center pivot, wheeled, gun or drip system.

Rates vary according to soil fertility, cropping history 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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizer to 97 gallons of water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer and 35 gallons of water when signs of infestation become apparent.



CUCUMBERS

AGGRAND fertilizers are most effective when applied to cucurbits at planting or transplanting, when they are 3-4" tall or during runnering, during first bloom and several weeks before final harvest. If AGGRAND products are being used in conjunction with a standard fertilizer program, apply after emergence and at runnering for best results. If not following a standard fertilizer program, apply AGGRAND fertilizers at all of the developmental stages listed below.

Root applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer, 1 gallon AGGRAND Liquid Bonemeal, 1 quart AGGRAND Kelp and Sulfate of Potash and 60 gallons of water. Apply as a pre-plant application.

1 gallon AGGRAND Natural Fertilizer and 20 gallons of water. Apply once a month.

Foliar applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 35 gallons of water. Apply as a fine mist with enough solution to thoroughly cover leaves (increase spray volume as crop develops to ensure thorough coverage). Perform first application when plants are 3-5" tall.

Repeat when plants begin to run. Increase rate if leaves are chlorotic. Plants may respond to another application of AGGRAND Natural Fertilizer at first bloom, depending on other inputs.

To extend the season for fresh-market cucumbers, apply AGGRAND Kelp and Sulfate of Potash late in the season and up to 3 weeks before final harvest. Use a per-acre mixture of 1 quart AGGRAND Kelp and Sulfate of Potash and 20 gallons of water. Apply as a fine mist with enough solution to cover leaves.

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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and Sulfate of Potash and 20 gallons of water when signs of infestation become apparent.

Soil Applications

Per-acre mix ratio:

2-3 gallons AGGRAND Natural Fertilizer and 20-30 gallons of water. Apply in spring or fall. Apply in spring and fall if soil is hard and low in organic matter. Optimize results by adding 2-3 gallons AGGRAND Liquid Bonemeal and 1-2 quarts AGGRAND Kelp and Sulfate of Potash to the mix.



GARLIC

Garlic responds best to a banded pre-plant 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 conditions call for extra calcium.

Banded applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer, 2 gallons AGGRAND Liquid Bonemeal, 1 gallon AGGRAND Kelp and Sulfate of Potash and 20 gallons of water. Apply in a band near the row prior to planting in the fall.

Soil applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 50 gallons of water. Apply at emergence.

2 gallons AGGRAND Natural Fertilizer, 1 gallon AGGRAND Kelp and Sulfate of Potash, 1 gallon AGGRAND Liquid Lime and 100 gallons of water. Apply just prior to bulbing.

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.

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and Sulfate of Potash and 20 gallons of water when signs of infestation become apparent.



GOLF COURSES

Natural fertilizer products have become a desirable and cost-effective alternative to synthetic turf-care products for golf courses. Naturally fertilized turf exhibits higher tolerance to environmental stress, increased soil microbial activity and recycling of nutrients, as well as better moisture retention and increased root development.

Bentgrass Tees and Greens

1 quart AGGRAND Natural Fertilizer and 6 gallons of water per 2,000 square feet once per month. Double rate on problem greens with no ill effects.

Add 1 pint AGGRAND Natural Kelp and Sulfate of Potash to reduce susceptibility to disease and drought during spring, late spring, late summer and early fall applications.

Add 1 quart AGGRAND Natural Liquid Bonemeal per 2,000 square feet in the fall to aid root development.

Seeding Greens and Tees

1 quart AGGRAND Natural Fertilizer, 1 pint AGGRAND Kelp and Sulfate of Potash and 9 gallons of water per 2,000 square feet along with 1 quart AGGRAND Liquid Lime and 6 gallons of water per 1,000 square feet.

Fairways

1 quart AGGRAND Natural Fertilizer and 6 gallons of water per 3,000 square feet; 1 pint AGGRAND Kelp and Sulfate of Potash and 3 gallons of water per 4,000 square feet and 1 quart AGGRAND Liquid Lime and 6 gallons of water per 2,000 square feet every 3-4 weeks.

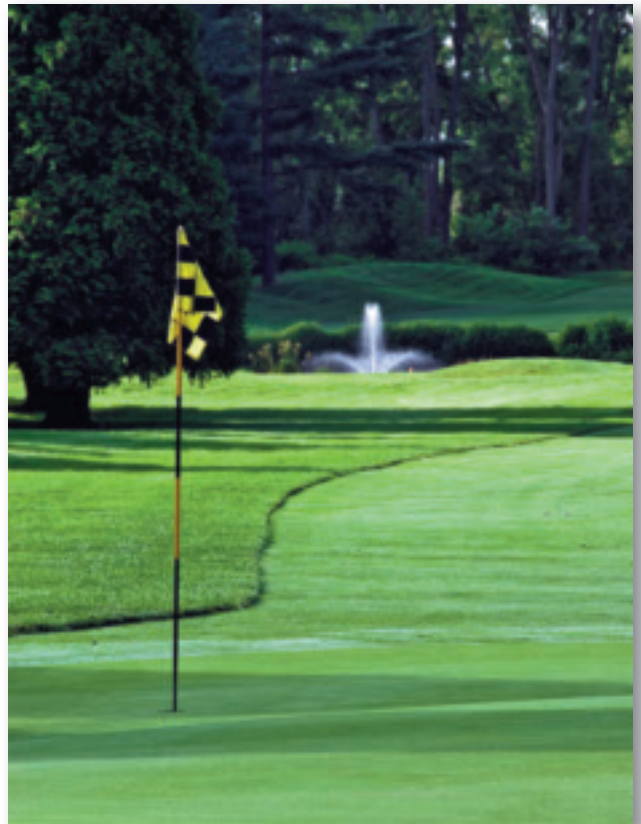
Nursery Stock

1 quart AGGRAND Natural Fertilizer, 1 pint AGGRAND Kelp and Sulfate of Potash and 10 gallons of water poured around the root ball at planting decreases the likelihood of transplant shock.

Trees Showing Signs of Stress

1 quart AGGRAND Natural Fertilizer, 1 pint AGGRAND Kelp and Sulfate of Potash and 10 gallons of water applied to the root zone stimulates feeder-root formation and nutrient uptake.

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and Sulfate of Potash and 20 gallons of water when signs of infestation become apparent.



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 and low to deficient amounts of calcium. The percentages of magnesium and calcium 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-calcium lime applied per acre during field renovation can 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 magnesium from the soil before applying lime. Some farmers have reported that the soil chemistry stays in balance with very little change over long periods when AGGRAND fertilizers are used in conjunction with the balancing of soil chemistry.

Foliar applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer, 1 gallon AGGRAND Liquid Bonemeal, 1 quart AGGRAND Kelp and Sulfate of Potash and 75 gallons of water. Apply as a fine mist with enough solution to thoroughly cover leaves. Perform first application in spring when plants are 4-6" in height. Adjust solution according to soil fertility.

Repeat application when crop begins to regrow (4-6" in height) and after each cutting or grazing (on rotationally grazed pastures). Perform 2-3 applications per year. If soil testing indicates moderate to high phosphorus levels or low calcium levels, substitute AGGRAND Liquid Lime for AGGRAND Liquid Bonemeal.

Rates vary according to soil fertility, cropping history, 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 or two heavier applications. If other constraints allow only one trip over the field, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1-2 gallons AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and Sulfate of Potash and 35 gallons of water when signs of infestation become apparent.

Pre-plant soil applications

Per-acre mix ratio:

3-6 gallons AGGRAND Natural Fertilizer and 50-100 gallons of water. Apply after seedbed preparation. Drag lightly after application



POTATOES

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

Banded Applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 20 gallons of water. Apply near the seed at planting. The addition of 1 gallon AGGRAND Liquid Bonemeal may be beneficial; especially when soil phosphorus levels are below 40 ppm.

Foliar Applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 25 gallons of water. Apply as a fine mist with enough solution to thoroughly cover the leaves. Increase spray volume as canopy develops to ensure thorough coverage. Perform foliar applications at 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, do not exceed a 4 percent dilution rate (4 gallons AGGRAND fertilizers to 96 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer and 25 gallons of water when signs of infestation become apparent. Substitute 2 quarts AGGRAND Kelp and Sulfate of Potash for AGGRAND Natural Fertilizer late in the season when additional nitrogen is not necessary.

Soil applications

Per-acre mix ratio:

3 gallons AGGRAND Natural Fertilizer and 30 gallons of water. Apply in spring or fall. Apply in spring and fall if soil is hard and low in organic matter.



TOBACCO

Tobacco responds well to AGGRAND fertilizer applications in the greenhouse, at transplanting and at lay-by. Nitrogen is a critical nutrient in tobacco production. Too much nitrogen late in the season causes suckering, which produces tobacco of non-uniform quality, while too little nitrogen causes reductions in yield. Nitrogen levels must be adjusted to maximize yield and crop quality.

Foliar Applications

Mix ratio:

2.5 ounces AGGRAND Natural Fertilizer and 1 gallon of water. Apply as a foliar spray to starts in the greenhouse when the tobacco reaches 3-5" in height. Apply enough solution to wet the foliage. Some farmers have better results by splitting the fertilization into two applications. When performing two applications use a mixture of 1.25 ounces AGGRAND Natural Fertilizer and 1 gallon of water. Make second application 10 days after the first. Plants must be set out in the field before they become root bound.

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; however, on tobacco which is picked selectively, the additional suckering may not be problematic. Mix 1 gallon AGGRAND Natural Fertilizer and 35 gallons of water. Apply as a fine mist with enough solution to thoroughly cover leaves (increase spray volume as crop develops to ensure thorough coverage). Substitute 1 quart AGGRAND Kelp and Sulfate of Potash after lay-by, when the additional nitrogen could be detrimental.

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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer and 35 gallons of water when signs of infestation become apparent.

Root Applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 100 gallons of water. Rates vary according to soil fertility and other inputs used. Apply when transplanting into the field. Do not exceed a 2 percent dilution rate when applying fertilizer to bare roots.

Soil Applications

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer and 20 gallons of water. Apply in spring or fall. Apply in spring and fall if soil is hard and low in organic matter. Optimize results by adding 2 gallons AGGRAND Liquid Bonemeal, 1 quart AGGRAND Kelp and Sulfate of Potash and 50 gallons of water to the mix.



TOMATOES - FIELD TOMATO PRODUCTION

Field tomatoes require sufficient levels of macro- and micronutrients to set fruit. Calcium, potassium and nitrogen are especially critical. Insufficient levels of these nutrients produce diseased plants and poor-quality fruit.

Soil Applications

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

Per-acre mix ratio:

2 gallons AGGRAND Natural Fertilizer, 2 gallons AGGRAND Liquid Bonemeal, 1 quart AGGRAND Kelp and Sulfate of Potash and at least 100 gallons of water. Keep well-watered between fertilizations.

Banded Soil Applications

Per-acre mix ratio:

3 gallons AGGRAND Natural Fertilizer and 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. The addition of 1 gallon AGGRAND Liquid Bonemeal and 2 quarts AGGRAND Kelp and Sulfate of Potash may also be beneficial, especially when soil phosphorus levels are below 40 ppm and soil potassium levels are below 150 ppm.

Pre-Plant Soil Applications

Per-acre mix ratio:

3 gallons AGGRAND Natural Fertilizer and 30 gallons of water. Apply in spring or fall. Apply in spring and fall if soil is hard and low in organic matter.

Foliar Applications

AGGRAND Natural Fertilizer can be applied to the leaves of tomatoes to supply additional nutrients.

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 50 gallons of water. 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 used. 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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and Sulfate of Potash and 35 gallons of water when signs of infestation become apparent.



TOMATOES - GREENHOUSE TOMATO PRODUCTION

Greenhouse tomato production requires sufficient levels of macro- and micronutrients to set fruit; calcium and potassium are especially critical. Insufficient levels of these nutrients result in diseased plants and poor-quality fruit.

Development of an organic growing system that stimulates rapid early growth and development is critical. The addition of aerobically composted (or other) material, worm castings or used potting mix, inoculates the media with micro-organisms. The microorganisms convert the 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 at a 2:1:1 ratio.
2. Substitute sandy loam, pumice, compost, castings etc. for part or all of the vermiculite.
3. Add 5 pounds high-calcium lime and 2.5 pounds of dolomite lime to 1 cubic yard of mix.
4. Soak the media with enough water to thoroughly wet the peat moss. Mix 1 gallon AGGRAND Liquid Lime, 1 quart AGGRAND Natural Fertilizer and 20 gallons of water. Add to 1 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 may be 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

Begin fertilizing the soil once seedlings have emerged and have developed 2-3 true leaves. AGGRAND products 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.

Mix 1.5 ounces AGGRAND Natural Fertilizer, 1 ounce AGGRAND Liquid Bonemeal, 0.5 ounces AGGRAND Kelp and Sulfate of Potash and 1gallon of water. Apply 1 cup of solution to each gallon of media. 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 Natural Fertilizer can be applied to the leaves of greenhouse tomatoes to supply additional nutrients. Mix 1 ounce AGGRAND Natural Fertilizer and 1 gallon of water. 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 after the development of 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, do not exceed a 3 percent dilution rate (4 ounces AGGRAND fertilizers to 1 gallon water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a mixture of 2 ounces AGGRAND Natural Fertilizer or 1 ounce AGGRAND Kelp and Sulfate of Potash and 1 gallon of water when signs of infestation become apparent.



WETLAND RICE

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

Too much nitrogen in a single application can cause lodging and reduce grain quality. Rice responds to the gradual release of nitrogen through the decomposition of organic matter. The use of green manures, or composted manure, and AGGRAND fertilizers supplies nitrogen slowly as the rice crop needs it. The addition of another source of nitrogen (up to 50 lbs. per acre) will increase yields, especially when there is an insufficient supply of organic matter.

Root Applications

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer, 1 gallon AGGRAND Liquid Bonemeal, 2 quarts AGGRAND Kelp and Sulfate of Potash and 30 gallons of water. Apply during transplanting.

If the field is drained between tillering and panicle formation, apply another per-acre mixture of 1 gallon AGGRAND Natural Fertilizer and 30 gallons of water.

Soil Applications

Per-acre mix ratio:

3 gallons AGGRAND Natural Fertilizer and 20 gallons of water. Till fertilizer into the soil by itself or spray onto compost, manure or green manure and incorporate into the soil. Apply in spring or fall. Apply in spring and fall if soil is hard and low in organic matter.

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.

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and Sulfate of Potash and 35 gallons of water when signs of infestation become apparent.



WHEAT AND SMALL GRAINS

The most significant factor in achieving a high yield of grain and/or forage in wheat is stand establishment. Planting high-quality seed of an adapted wheat variety in a fertile, well-prepared seedbed with enough moisture to achieve a rapid, uniform stand is an important step in attaining acceptable yields.

Post-Harvest (if desired)

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer and 35 gallons of water. Till in with stubble or crop residue in late summer.

Pre-Harvest

Per-acre mix ratio:

1 gallon AGGRAND Natural Fertilizer, 1 gallon AGGRAND Liquid Lime and 75 gallons of water. Apply as a fine mist to thoroughly cover foliage. Apply in spring, after green-up and at tillering.

2 gallons AGGRAND Natural Fertilizer and 75 gallons of water. Applied as a foliar application at flag leaf, before heading (boot-up). Add 0.5 gallons AGGRAND Kelp and Sulfate of Potash to the mix to enhance grain quality.

Low organic matter levels in soils can be gradually improved by incorporating crop residues into the soil.

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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and Sulfate of Potash and 35 gallons of water when signs of infestation become apparent.



WILDLIFE FOOD PLOTS

The key to attracting game with food plots is providing a food source that offers higher nutrients than the natural forage can deliver. AGGRAND Wildlife Food Plot Formula helps boost nutrient levels by enhancing natural soil microbial activity while providing the primary, secondary and micro-nutrients plants need to flourish.

Soil Applications

Per-acre mix ratio:

1 gallon AGGRAND Wildlife Food Plot Formula, 1 gallon AGGRAND Liquid Lime and 30 gallons of water. Apply at planting.

If soil analysis indicates nutrient deficiencies, supplement or replace AGGRAND Liquid Lime with 1 gallon AGGRAND Liquid Bonemeal and 2 quarts AGGRAND Natural Kelp and Sulfate of Potash.

Foliar Applications

Per-acre mix ratio:

1 gallon AGGRAND Wildlife Food Plot Formula, 1 gallon AGGRAND Liquid Lime and 75 gallons of water. Apply when seedlings are 4-6 inches high.

If soil analysis indicates nutrient deficiencies, supplement or replace AGGRAND Liquid Lime with 1 gallon AGGRAND Liquid Bonemeal and 1 quart AGGRAND Kelp and sulfate of potash.

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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).



WINE GRAPES

Wine grapes (*Vitis vinifera*, *Vitis labrusca*, *Vitis rotundifolia* spp.) do best on rather poor, but fairly deep (2-3 feet), gravelly and well-drained soils with a south to south-east exposure. Proper nitrogen fertilization of grapes can generally be achieved with regular applications of compost worked into the top 2-3 inches of soil around the vines, 2-3 weeks before bud burst. Supplemental nitrogen should only be applied when annual vine growth is inadequate, or leaves are a lighter green.

Per-acre mix ratio:

1st application: 2 gallons AGGRAND Natural Fertilizer, 1 gallon AGGRAND Kelp and Sulfate of Potash and 100 gallons of water. Root zone irrigate in early spring.

2nd application: 1 gallon AGGRAND Natural Fertilizer, 0.5 gallons AGGRAND Kelp and Sulfate of Potash and 50 gallons of water. Foliar feed in spring at pre-bloom stage (2-5 days prior to bloom).

3rd application: 0.5 gallons AGGRAND Kelp and Sulfate of Potash and 20 gallons of water. Foliar feed at berry set.

4th application: 0.5 gallons AGGRAND Kelp and Sulfate of Potash and 20 gallons of water. Foliar feed at beginning of ripening (veraison).

5th application: (Optional) Repeat first application in fall after harvest. Till into soil with organic matter or legume cover crop.

New planting: Use same rates given under 1st application, working into soil in planting zone, along with well-rotted manure or compost.

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, do not exceed a 3 percent dilution rate (3 gallons AGGRAND fertilizers to 97 gallons water).

To reduce susceptibility to attack of insects and disease-causing organisms, apply a per-acre mixture of 1 gallon AGGRAND Natural Fertilizer or 1 quart AGGRAND Kelp and sulfate of Potash and 35 gallons of water when signs of infestation become apparent.



