



**Application Methods updated for 2013**  
**Methods can vary due to soil Health**

**With continuing field trials every year we work to improve**  
**An already great product for anything with a root system**



**SumaGreen 28 Tradition Circle, Egg Harbor Township, NJ 08234**  
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The following application guidelines are offered as a tool for anyone making application recommendations. Many factors are considered when making application recommendations including:

- Soil nutrient levels
- Soil type
- Percentage of organic matter
- Crop to be grown
- Stage of plant growth
- Cropping history
- Environmental conditions

The application timing and rates may be changed to fit a particular situation that is impacted by one or more of the above mentioned factors.

In organic operations, it is recommended that all application rates be increased 100% of traditional applications for conventionally grown crops (conventional rate of 1 gallon per acre will increase to 2 gallons per acre). This increase is recommended because the build-up of residual soil nutrients in organic fields is typically less than that found in conventionally fertilized fields. Additionally, organic fertilizer products tend to have a slow release of nutrients compared to that of chemical fertilizers. Number and frequency of applications may also have to be increased for the same reasons.

We do recommend consulting a current soil report when making application decisions. Additionally, as a general rule, we recommend a 50% reduction of the normal N-P-K rate.

#### **NOTICE – FOR OPTIMAL RESULTS**

- The standard application rate is 1 gallon per acre in sufficient water to apply the desired rate
- **If already using N-P-K products:** It is recommended that N-P-K application rates be reduced by 50% when using products containing SumaGreen
- If Soil Organic Matter (OM) is low (i.e. heavy sand or heavy clay soils, increase the initial application rate by ½ gallon for all applications.
- Avoid extreme temperatures. Store at 40°F – 80°F.
- Always properly calibrate your sprayer prior to application to assure recommended application rate per acre is achieved.
- Apply in late afternoon or at sundown to ensure optimal absorption.
- For second application: Foliar application is suggested.
- If foliar application of SumaGreen is recommended, the droplet/particle size should be very fine. Large droplets will roll off the leaf surface.
- The entire spray tank and system should be rinsed and flushed thoroughly before and after the application of SumaGreen.

#### **CO-APPLICATION:**

- Products containing SumaGreen can be co-applied with your irrigation water through a metered irrigation system.
- Product can also be co-applied with some liquid fertilizers and herbicides. A jar compatibility test is always recommended before application is made.
- **DO NOT CO-APPLY** SumaGreen with fungicides or fumigants.

**Agitation:**

- The product should be gently agitated prior to application. In smaller containers, simply shake the container prior to loading into sprayer.
- With bulk carrels and totes, agitate prior to transferring to sprayer (can use air wand or paddle agitator).
- If product has been stored for a period of time, agitate the product and pour through 50 mesh screen. If there is no clogging of the screen, the product will pass through most spray systems with no problems.

**Note:** Loosen caps on containers upon receipt of product so that microbes can receive oxygen. Leave caps loose until product is applied.

**AREA:**

1 hectare = 2.5 acres

1 acre = 0.4 hectares

**WEIGHT & VOLUME:**

1 ounce = 28 grams

1 gram = 0.035 ounces

1 pound = 0.45 kilograms

1 kilogram = 2.2 pounds

1 fluid ounce = 30 milliliters

1 milliliter = 0.03 fluid ounces

1 gallon = 3.8 liters

1 liter = 0.26 gallons

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Cereals	
Wheat	
Corn	Rice*
Sorghum	Barley
Rye	Oats
Millets	Other Cereals

Cereals:

1. Apply ½ gallon per acre at planting.
2. Apply ½ gallon per acre 3-4 weeks after crop emergence.

Rice\*:

Sprouted seeds

1. At planting (drill or broadcast), treat seed prior to planting at the rate of ½ gallon per 100 lbs. of seed.
2. Apply 1 gallon per acre at 30 days
3. Apply ½ gallon per acre at flag leaf/boot leaf/pre-flowering stage.

Seedlings → Transplant

1. At transplantation, dip the roots in a solution of 6 oz. SumaGreen per gallon of water.
2. Apply ½ gallon per acre after 30 days.
3. Apply ½ gallon per acre at flag leaf/boot leaf/pre-flowering stage.

Single Treatment per Season

1. Sprout seed in 1 gallon/40-80 lb seed
2. Pre-soak seeds in 6 oz. SumaGreen product per gallon of water.
3. Soak for 24-36 hours, drain, place seed in wet cloth sack.
4. Over the next 24 hours, turn sack occasionally keeping the sack moist and in a warm, shady area.
5. Seed can be broadcast/drilled after 24 hours.

Vegetables and Melons	
Leafy or Stem Vegetables	
Artichokes	Lettuce
Asparagus	Spinach
Cabbages	Chicory
Cauliflowers & Broccoli	Other Leafy or Stem Vegetables
Fruit-bearing Vegetables	
Cucumbers	Cantaloupes and Other Melons
Eggplants	Pumpkin, Squash, and Gourds
Tomatoes	Other Fruit-bearing Vegetables
Watermelons	Okra
Root, Bulb, or Tuberous Vegetables	
Carrots	Onions (including Shallots)*
Turnips	Leeks & Other Alliaceous Vegetables
Garlic	Other Root, Bulb, or Tuberous Vegetables
Home Vegetable Garden	

Home Vegetable Garden:

1. To transplant: Dip roots in 3 oz SumaGreen per gallon of water. Add ½ cup to planting hole.
2. Apply every 2 weeks to soil around plants using 3 oz. per gallon of water.
3. Seed Crops: Apply to row at planting using 3 oz. SumaGreen per gallon of water.
4. Apply every 2 weeks to soil around plant using 3 oz. per gallon of water.

Leafy or Stem Vegetables:

1. Transplants – Dip roots using 3 oz. SumaGreen per gallon of water. Use remaining product to water the transplants.
2. Apply ½ gallon per acre after planting/sowing
3. Apply ½ gallon per acre 3-4 weeks later.

Fruit-Bearing Vegetables:

1. Transplants – Dip roots using 3 oz. SumaGreen per gallon of water. Use the remaining product to water the transplants.
2. Apply ½ gallon per acre after planting/sowing
3. Apply ½ gallon per acre 3-4 weeks later.

Root, Bulb or Tuberous Vegetables:

1. Apply ½ gallon per acre at planting.
2. Apply 1 quart per acre 2 weeks later.
3. Apply 1 quart per acre 2 weeks after last application.

Onions\*

1. Apply ½ gallon per acre in furrow or directly over the row at planting.
2. Apply ¼ gallon per acre two weeks after planting followed by the same application two weeks later as a sidedress.
3. Apply ½ gallon per acre as a sidedress when the tops begin active growth in late winter.

Fruit and Nuts	
Tropical and Subtropical Fruits	
Avocados	Mangoes
Bananas and Plantains*	Papayas
Dates	Pineapples*
Figs	Other Tropical and Subtropical Fruits
Citrus Fruits	
Grapefruit and Pomelo	Tangerines, Mandarins, Clementines
Lemons and Limes	Other Citrus Fruits
Oranges	
Grapes	
Berries	
Currants	Strawberries*
Gooseberries	Blueberries
Kiwi Fruit	Other Berries
Raspberries	
Pome Fruits and Stone Fruits	
Apples	Pears & Quinces
Apricots	Plums & Sloes
Cherries & Sour Cherries	Other Pome Fruits and Stone Fruits
Peaches & Nectarines	
Nuts	
Almonds	Pistachios
Cashew Nuts	Walnuts
Chestnuts	Other Nuts
Hazelnuts	
Other Fruits	

Tropical and Subtropical Fruits:

1. Apply 1 pint per tree in planting hole.
2. Apply 1 gallon per tree each year in split applications (new growth, flowering, fruiting).

Pineapple\*

1. Apply ½ gallon per acre at planting.
2. Apply ½ gallon per acre 3 weeks later.
3. Apply ½ gallon per acre at 4, 6, and 12 months of growth.
4. After each harvest, apply ½ gallon per acre to ratoon crop and repeat treatment at 3 weeks, 4 months, 6 months, and 12 months.

Banana\*:

**For Nematode Infested Soil**

1. Use nematode-free materials for planting on uninfested land.
2. Select healthy, disease-free plants; dip then in solution for no more than 10 minutes then place in ground.
3. For diseased plants: trim the corm tissue until all black or discolored spots have been removed, leaving only clean, white tissue; wash corms in running water and allow them to dry before planting; submerge trimmed plants for 20-25 minutes in hot water at 127° - 129°.
4. In more healthy areas, apply 2 gallons per acre in split applications at 2 month intervals.
5. In more infested areas, apply 3 gallons in two split applications:
  - a. 2 gallons per acre in 4 split applications 2 weeks apart.
  - b. Remaining gallon as a soil treatment just before flowering.

**For Healthy Plants (all are soil-based applications):**

1. Apply 1 gallon per acre immediately.
2. Apply ½ gallon per acre 4 weeks after initial application.
3. Apply ½ gallon per acre just before flowering. m

**Citrus Fruits:**

1. Apply ½ quart per tree in the planting hole.
2. Apply 1 gallon per tree each year in split applications (ex: start of new growth, flowering, fruiting).

**Grapes:**

1. Apply ½ quart per plant in planting hole.
2. Apply 1 gallon per acre each year in 3 split applications (early growth, flowering, fruit set).

**Berries:**

1. Apply ½ quart per tree in planting hole.
2. Apply ½ gallon per acre at early bud break.
3. Apply ½ gallon per acre at “early fruit set”.

**Strawberries\*:**

1. Apply 1 gallon per acre at planting.
2. Apply 1 quart per acre at 4 leaf stage.
3. Apply 1 quart per acre at first bloom and every 7 days throughout peak harvest.

**Pome Fruits and Stone Fruits:**

1. Apply ½ quart per tree in planting hole.
2. Apply 1 gallon per tree each year in 3 split applications (bud break, bloom set, fruit set)

**Nuts:**

1. Apply ½ quart per tree in planting hole.
2. Apply ½ gallon per tree each year until tree starts bearing fruit.
3. Apply 1 gallon per tree each year to mature tree.

Oilseed Crops	
Soybeans	
Groundnuts (Peanuts)	
Other Temporary Oilseed Crops	
Castor Bean	Safflower
Linseed	Sesame
Mustard	Sunflower
Niger Seed	Other Temporary Oilseed Crops
Rapeseed	
Permanent Oilseed Crops	
Coconuts	Oil Palms*
Olives*	Other Oleaginous Fruits

**Soybeans:**

1. Apply ½ gallon per acre at planting.
2. Apply ½ gallon per acre 3-4 weeks after crop emergence.

**Peanuts:**

1. Apply 1 gallon per acre at planting.
2. Apply ½ gallon per acre at “pegging”.
3. Apply ½ gallon per acre at “bloom stage”.

**Other Temporary Oilseed Crops:**

1. Apply ½ gallon per acre at planting.
2. Apply ½ gallon per acre 3-4 weeks after crop emergence.

**Permanent Oilseed Crops:**

**Olive\*:**

**Dilution for Root Dip and Planting:**

1. Remove the tree from its container and examine the roots. Give a root dip in SumaGreen before planting using 1 gallon per acre for 120-180 trees.
2. Apply 2 gallons in 4 split applications. First application at 15 days after planting followed by 2 applications at 15 day intervals.
3. The 4<sup>th</sup> application will be given 15 days before the flowering period (3-4 years if grown from seed, 2 years if started as transplants).

**Seed Treatment:**

For growing olives from seed, a seed treatment with SumaGreen is recommended before planting them in containers. Soak seed in a SumaGreen slurry for 10 minutes, pour over a screen, and allow seed to dry.

**Mature Trees:**

For large trees, the recommendation will vary according to the age of the tree and the canopy. A general recommendation would be ½ gallon per acre applied 6 times during the growing season.

Oil Palm\*, Coconuts, Other Oleaginous Fruits:

**Nursery Stage:**

Apply 1 gallon per acre (depending on the number of plants per acre) as a soil treatment at the time of raising the nursery.

**1-3 Years of Growth:**

Apply 1 gallon per acre in split applications of ½ gallon at 6 monthly intervals every year.

**Mature Plants (3+):**

Apply 1 gallon per acre before flowering each year.

Root/Tuber Crops With High Inulin Content
Potatoes
Sweet Potatoes
Cassava
Yams
Other Roots & Tubers

Root/Tuber Crops with High Starch or Inulin Content:

1. Transplants – Dip roots using 3 oz. SumaGreen per gallon of water.
2. Apply ½ gallon per acre at planting
3. Apply ½ gallon per acre 4 weeks after planting.

Beverage & Spice Crops	
Beverage Crops	
Coffee*	Cocoa
Tea*	Other Beverage Crops
Maté	
Spice Crops	
Temporary Spice Crops	
Chilies & Peppers (Capsicum spp.)	Other Temporary Spice Crops
Anise, Bandian, and Fennel	
Permanent Spice Crops	
Pepper (Piper spp.)	Ginger
Nutmeg, Mace, Cardamoms	Vanilla
Cinnamon	Black Pepper*
Cloves	Other Permanent Spice Crops

**Beverage Crops:**

Follow the application guidelines for coffee as applicable for crop, stage of growth, and production.

**Coffee\*:**

**For Coffee Bean Germination Process:**

Apply ½ gallon per number of seeds intended to cover one acre of land.

**Coffee Seeds in Nursery Beds:**

When seedlings reach approx. 30-40cm tall, the plant’s roots should be dipped in SumaGreen for 2 minutes prior to transplanting.

Apply the remainder of the product to the soil.

**Application Interval:**

1. Apply ½ gallon per acre one month after transplanting and every 4 months until pre-flowering (approx. 4 years).
2. Apply ½ gallon per acre after flowers are fertilized and forming pods.
3. Apply 1 gallon per acre at harvesting, pruning, flowering, and at pod formation.

**Note:**

Judge the size of your coffee plant. If the tree is tall with an open canopy, applications should be at the drip line to feed the feeder roots.

**Tea\*:**

3 gallons per acre in split applications per year depending on the number of pluckings and the time interval between each plucking for an estimated 3500 bushels per acre. The 3 gallons can be split into 6 parts – ½ gallon each time after the plucking of the top leaves and buds.

**Temporary Spice Crops:**

1. Apply ½ gallon per acre at planting.

2. Apply ½ gallon per acre when plants are 3-4 inches tall and first true leaves present.

Permanent Spice Crops:

**Establishment:**

Apply ½ quart of SumaGreen mix per plant in hole.

**Maintenance:**

1. Apply 1 gallon per 100 plants.
2. Apply ½ gallon per 100 plants 4 weeks later.
3. Apply ½ gallon prior to flowering.

Black Pepper\* (per 100 vines):

1. 1 gallon per 100 vines focusing on the root zones.
2. ½ gallon per 100 vines one month after the first application.
3. ½ gallon before flowering (at the time of spike formation).

## Leguminous Crops

Beans
Broad Beans
Chick Peas
Cow Peas
Lentils
Lupins
Peas
Pigeon Peas
Other Leguminous Crops

### Leguminous Crops:

1. Apply  $\frac{1}{2}$  gallon per acre at planting.
2. Apply  $\frac{1}{2}$  gallon per acre 3 weeks after planting.

## Sugar Crops

Sugar Beet
Sugarcane*
Sweet Sorghum
Other Sugar Crops

### Sugar Crops:

1. Apply  $\frac{1}{2}$  gallon per acre at planting.
2. Apply  $\frac{1}{2}$  gallon per acre 4 weeks after plant emergence.

### Sugarcane\*:

1. Dip cuttings in SumaGreen for 5 minutes. Plant and apply 1 gallon per acre.
2. Apply 1 gallon per acre at green up each year beginning with year 2.
3. Apply  $\frac{1}{2}$  gallon per acre 4 weeks later.

Other Crops	
Tobacco	
Grasses and Other Fodder Crops	
Temporary Grass Crops	Permanent Grass Crops
Fiber Crops	
Temporary Fiber Crops	
Jute, Kenaf, and Other Similar Crops	Cotton
Flax, Hemp, and Other Similar Products	Other Temporary Fiber Crops
Permanent Fibre Crops	
Eucalyptus*	
Rubber	
Flower Crops	
Temporary Flower Crops	
Permanent Flower Crops	
Daylilly*	
Other Crops	
Temporary Crops	
Permanent Crops	
Forest Trees	Pine/Christmas Trees*
Nursery Crops	Hydroponic Crops

**Tobacco:**

1. Apply ½ gallon per acre at planting.
2. Apply ½ gallon per acre 3-4 weeks after crop emergence.

**Temporary/Permanent Grass Crops:**

**Establishment:**

1. Apply ½ gallon per acre at seeding/sprigging.
2. Apply ½ gallon per acre after stand establishment

**Maintenance:**

1. Apply ½ gallon per acre at green-up.
2. Apply ½ gallon per acre 4-6 weeks later.

**Hay Fields:**

1. Apply ½ gallon per acre at green-up.
2. Apply ½ gallon per acre every 60 days during harvest season or after every-other cutting of hay.

**Turf Farms:**

1. Apply 1 gallon per acre at spring green-up.
2. Apply ½ gallon per acre two more times during the growing season.

**Athletic Fields:**

1. Apply 1 gallon per acre at spring green-up.
2. Apply ½ gallon per acre every-other month during growing season.

**Golf Courses:**

1. Apply 2 gallons per acre (or 6 oz. per 1,000 sq./ft.) for first application. This application should be as close to spring green-up as possible for greens and fairways.
2. Apply 1 gallon per acre every-other month on fairways. Greens will need 3 oz. per 1,000 sq./ft. every month. This can be split into two applications. n

Temporary Fiber Crops:

1. Apply ½ gallon per acre at planting.
2. Apply ½ gallon per acre 3-4 weeks after crop emergence.

Permanent Fiber Crops:

Eucalyptus\* (Usual density is 218-311 trees per acre):

1. Add 1 tbsp. SumaGreen to 6 oz. cup and fill with water. Dip plant for no more than 1 minute then set plant in hole.
2. Apply 3 gallons per acre in 3 split applications per year for the first 3 years.
3. Apply 1 ½ gallons per acre to mature trees in 3 split applications per year.

Rubber Trees:

Temporary Flower Crops:

**Indoor/Outdoor Potted Plants:**

Apply 1 cup of SumaGreen mixture (3 oz/ per gallon of water) once per month. Water plants normally as required.

Permanent Flower Crops:

Daylily\*:

**Dilution for root dip and planting:**

1. Add 1 tbsp. SumaGreen to a 6 oz. cup and fill with water. Dip plant in cup for 5 seconds and set plant in hole.
2. Add remaining mixture to planting hole.

**For Established Plants:**

1. Mix 6 oz. in 2 or more gallons of water and apply to 1,000 sq./ft. First applications should be made in February.
2. Apply a second application in May.

Other Permanent Crops:

Pine/Christmas Trees:

1. Select healthy pine seedlings with 6"-8" taproot and good lateral root development – remove dead ones before treatment.
2. Take 1 gallon of SumaGreen and dilute it ten times using irrigation water – the diluted formula can then be used for seedling root dip treatments.
3. Dip the roots of the seedlings in the diluted formula for no more than 30 minutes then transplant immediately without drying. If pruning the taproot is routine, trim the root prior to the root dip.
4. The leftover dilution can be added at the time of planting. The root collar should be buried 1"-2" deeper (up to 3") in the field than in the nursery.
5. Follow the same instructions for 2 gallons per acre. The remaining solution will be diluted and applied 30 days after transplantation.

**\*Note\*** The following recommendations are based on the personal experience of Eugene and Margie Gruenbeck, owners of Red Oak Nursery. They have been using “SumaGreen, Inside” products on a variety of nursery crops grown in baskets, buckets, and in the ground. Any reference to a specific product or brand name does not constitute endorsement of or by Bio Soil Enhancers, Inc. or Tall Harvest, LLC.

#### Nursery Crops:

Always apply to moist soil. Do not apply to very dry pots

##### 1. Initial Application:

- a. If injection is possible, apply 1-2 gallons per acre or 3-6 oz. per 1,000 sq.ft.
- b. If using Dositron, hose on, or siphonex, apply 3.75 oz. per 100 gallons of finished solution that comes out of the hose. Apply enough to each pot to thoroughly cover the surface of each pot, it does not need to run out of the bottom on pots larger than 5”, just cover the surface and penetrate approximately 3” of soil. It is suggested that you should check yourself after using to see if you fall into the 1-2 gallons per acre range.

##### 2. Subsequent Applications:

- a. If injection is possible, apply 32 oz. per acre or  $\frac{3}{4}$  oz. per 1,000 sq. ft. every 3 weeks.
- b. Or apply as a “SprencH”, a heavy spray to ground surface and foliage at approximately 32 oz. per acre or  $\frac{3}{4}$  oz. per 1,000 sq. ft. After applying it is recommended that you check to see if you are close to the recommended rate.
- c. SumaGreen, Inside forage formula is what I generally recommend for most nursery crops in containers or if it is growing in the ground. There are a few exceptions to this recommendation.
- d. SumaGreen, Inside’s general ag formula is recommended for the following: Poinsettias, crape myrtles, and sycamores after the initial application of the forage formula.
- e. If plants have reached optimum size in the pots and are showing moisture stress (wilting, drooping, leaf graying, yellowing, & abscission of lower foliage), the appropriate formulation can be reapplied at the initial rate to help reduce moisture stress. I recommend adding  $\text{KNO}_3$  (6-9 oz. per 100 gallons) + Helena’s Soaker (24-48 oz. per gallon)

##### 3. Nutrition:

- a. Potassium Nitrate ( $\text{KNO}_3$ ) 6-9 oz. as sprencH or drench and/or Helena’s Coron 28-0-0 at 24-18 oz. per gallon as a foliar only. Both  $\text{KNO}_3$  and Coron 28-0-0 can be tank mixed if foliar is applied as a sprencH. Do not mix other nutrients (macro or micro), chelates, or liquid feed mixes as I have found very few to be compatible with SumaGreen, Inside products.
- b. In general, reduce nutrition rates by 25% average when using SumaGreen Inside products. Exceptions are dogwoods, sycamores, and deciduous magnolias where nutrients can be reduced by at least 50% or more.
- c. Phosphorus is very leachable in nursery soil mixes. I have seen benefits with additional slow-release phosphorus in mixes where the phosphorus is a lower number.

##### 4. Watering:

- a. With proper management, watering may be reduced 10-50% depending on the crop (genus, species, size of plant, etc.), time of year, daily conditions, and how closely you have managed your water in the past.

Nutrients can be reduced while using SumaGreen, Inside products. The above are suggestions for a starting point. The nutritional recommendations is the individual Grower's responsibility, not that of Bio Soil Enhancers, Inc., Red Oak Nursery, or Eugene and Margie Gruenbeck's responsibility.

#### Hydroponics:

1. Initial Application:
  - a. Apply 1-2 gallons per acre (3-6 oz. per 1,000 sq. ft.)
2. Rate per plant:
  - a. Divide the number of plants stocked per 1,000 sq. ft. into rate per 1,000 sq. ft.  
200 plants per 1,000 sq. ft.  
3 oz. per 1,000 sq. ft.  
 $3/200 = 0.015$  oz. or  $\frac{1}{2}$  ml per plant
3. Subsequent Applications:
  - a. Apply 10 oz. per acre or  $\frac{1}{4}$  oz. per 1,000 sq. ft. once a week during growing season.