

General information about foliar fertilizer applications.

Foliar feeding or foliar fertilization is a term describing the application of necessary plant nutrients to the above ground, living plant parts. Its purpose is not to replace soil fertilization, but rather to supplement plant nutrient needs during short and/or critical growth stages.

Foliar feeding is intended to delay natural senescence processes shortly after the end of reproductive growth stages.

Foliar feeding targets the growth stages where declining rates of photosynthesis and the leveling off of root growth and nutrient absorption occur. It attempts to aid translocation of nutrients into seed, fruit, tuber or vegetative production.

Foliar feeding can be an effective management tool to favorably influence pre-reproductive growth by compensating for environmentally induced stresses such as adverse growing conditions and/or poor nutrient availability.

Early foliar applications can make an already good crop better, either by stimulating more vigorous regrowth or by increasing the yield potential. The practice is a highly efficient and timely method of applying needed plant nutrients and a means of compensating for soil or environmentally induced nutrient deficiencies.

Crop Growth Stages

It is important to apply foliar fertilizer at the proper growth stages. Foliar applications should be timed to provide needed nutrients during the yield determining growth stages. Multiple, low rate applications may show the most favorable crop yield responses. Monitor crop growth on a weekly or even on a daily basis for proper determination of the targeted growth stage. Regular plant tissue testing is essential to identify those nutrients that are most limiting crop growth.

Crop Conditions

Generally, crops that are nutritionally sound will be more likely to respond to foliar feeding. This is due to better tissue quality (allowing for maximum absorption of nutrients into leaf and stem) and faster growth (translocatable nutrients will be moved rapidly to the rest of the plant). Crops under heat or moisture stress show less response to foliar fertilizer applications. When the stress is removed and the crop begins to recover, foliar applications may be resumed successfully.

Meteorological Conditions

Environmental influences, such as time of day, temperature, humidity and wind speed influence the physical and biological aspects of foliar applications. Warm, moist and calm conditions favor highest plant tissue permeability to foliar applied nutrients.

Time of day: Ideal conditions are most likely found during the evening hours and early morning.

Temperature: 65-85 degrees F, 70 degrees is ideal.

Humidity: Greater than 70% is best.

Temperature + Humidity: 140-160.

Wind speed: Less than 5 mph.

Fertilizer Materials

Not all fertilizers are suitable for use in foliar applications. The objective is for maximum absorption of nutrients into the plant tissue with a minimum or no foliage damage. Fertilizers should meet the following standards:

Low salt index: Reduces or eliminates potential tissue damage from fertilizer burn.

High solubility: Reduces the volume needed for application. Liquid fertilizers work best.

High purity: Needed to eliminate interference with spraying, solution compatibility or unexpected adverse effects on foliage.

Surfactants and other spray additives can have a positive effect. Consult product labels for appropriate uses and follow all instructions completely. Always run compatibility tests on the products that will be sprayed together before mixing into the spray tank.

Reference: Foliar Nutrition, Midwest Laboratories, Inc., Omaha, NE. 1995

PureGrade Liquid Plant Food



Nutra-Flo® SUPER 72 Slow Release Nitrogen

Soil and Foliar Application of Nutra-Flo Super 72 on all Types of Crops

Super 72 is 28% (28-0-0) nitrogen containing 72% slow-release nitrogen. It contains 3 pounds of nitrogen per gallon. Super 72 may be used on all types of crops to correct nitrogen deficiencies and to extend the nitrogen release period for improved efficiency. It may be soil or foliar applied.

Super 72 features increased crop safety and increased nitrogen absorption, translocation and remobilization. It may be used alone or added to other compatible nitrogen or NPK solutions to make a variety of fertilizer grades. By varying the amount of Super 72 added to a fertilizer solution, the desired level of slow release nitrogen can be matched to crop needs throughout the growing season.

PRECAUTIONARY STATEMENTS

Keep out of the Reach of Children

Avoid prolonged or repeated contact with the eyes, skin and clothing. Wear chemical goggles or a full face shield when handling this product. Protect skin by wearing appropriate protective equipment, such as rubber or plastic aprons, rubber gloves and boots. Avoid breathing mist or vapor. Keep containers closed. Wash thoroughly after handling. May cause gastrointestinal distress if swallowed.

May Cause Irritation to Skin and Eyes

First Aid: In case of contact with eyes, immediately flush eyes with water for at least 15 minutes. Seek immediate medical attention if irritation occurs. In case of skin contact, flush skin with water. If irritation occurs seek medical attention. Remove and wash contaminated clothing before reuse. If swallowed, give large amounts of water and induce vomiting by touching back of throat with finger unless unconscious. Seek immediate medical attention.

Handling and Storage: Minimize skin exposure. Store mini-bulks and smaller containers out of the sun in an area of moderate temperature. Do not reuse containers. Avoid containers, piping or fittings made of copper-containing alloys or galvanized metal. Dispose of containers in accordance with local regulations and requirements.

Phytotoxicity: Plant and leaf injury may occur on some crops when certain weather and growing conditions are present. Follow directions carefully, including precautions for safe handling. The user assumes all risks of use and handling.

GENERAL INSTRUCTIONS

Super 72 may be applied to the soil, foliar sprayed or injected through irrigation systems. It may be applied as a concentrate or dilute solution by ground or aerial equipment. Apply with sufficient water for adequate plant coverage, especially during periods of low humidity and high temperatures.

Super 72 nitrogen release is over a period of 8 to 12 weeks. In spring, fall and during periods of cool temperatures, it is recommended that low-biuret urea be blended with Super 72 to enhance the release pattern.

Super 72 may be custom formulated with many compatible phosphorus, potassium and micronutrient fertilizers and crop protection chemicals. Always test for compatibility in the appropriate concentrations.

Do not blend with highly acidic materials and materials containing high levels of ammonia.

SOIL APPLICATION

Super 72 should be banded when applied to the soil. Best results can be attained when Super 72 is banded beside or between the rows of crops during planting or side-dressed before maximum nitrogen needs by the crop. The amount of Super 72 to use is dependent on the need of the crop and the amount of slow release nitrogen desired in the fertilizer mix. Super 72 may be used alone or blended with nitrogen or NPK solutions to make custom grades of fertilizer. Conduct compatibility tests until experience is gained.

Soil Application Benefits:

- Excellent for banding or sidedress.
- N released later in the growing season during time of greatest crop needs.
- Reduced N leaching.
- May be used alone or blended in any proportion with many other liquid fertilizers.
- Fewer nitrous oxide (greenhouse gas) emissions when applied in the soil compared to other N sources.

FOLIAR APPLICATION

Continue your fertility program with scheduled foliar applications. Foliar applications of Super 72 can add yield, quality and more uniform maturity and quickly overcome nitrogen deficiencies.

Foliar Benefits:

- No ammonia volatilization for excellent safety on plant tissues.
- High temperature application possible with low spray volume.
- Adheres to plant leaves in the liquid form for an extended foliar activity.
- Sticks to leaf even in mist or light rain.
- Increased nitrogen absorption.
- Improved translocation in the plant.
- Fast crop response.
- Use as a carrier for micronutrients or pesticides.

Tank Mixing Procedure for Nutra-Flo Super 72 nitrogen:

1. Add ½ of total water to spray tank.
2. Start agitation of the water.
3. Add Super 72 (or Super 72/NPK blends).
4. Add compatible micronutrients.
5. Add flowable materials.
6. Add soluble powders and/or water soluble fertilizers (should be pre-dispersed in water before adding to the spray solution).
7. Complete filling the spray tank with water to desired volume and continue agitation until spray application is completed.
8. Flush all spray and nurse equipment after usage.

Growers who want phosphorus and potassium pre-blended with Super 72 should consider using Nutra-Flo's Foliar 20-3-5. Twenty-five percent of the nitrogen in 20-3-5 is in the slow release form.

TABLE 1. FIELD CROPS

Suggested application rates and time of application for Nutra-Flo Super 72 Nitrogen.		
CROP	GALLONS/ACRE	TIME OF APPLICATION
Alfalfa	1.0 – 3.0	Apply after each cutting when sufficient foliage is present.
Canola	1.0 – 2.0	Apply just before bolting.
Corn, Field	1.0 – 1.5	12 to 24 inches tall. Tassel emergence. After pollination.
Corn, Seed	1.0 – 1.5	Before detasseling. Repeat after pollination.
Cotton	1.0 – 3.0	Early boll formation and repeat at 14 to 21 day intervals.
Flax	1.5 – 2.5	Early boll development.
Grain Sorghum	1.0 – 1.5	After pollination.
Grass seed production	2.0 – 3.0	Seed head elongation.
Hops	1.0 – 1.5	Before cone development.
Peanuts	1.0 – 1.5	Early bloom. Repeat at 14 to 21 day intervals until pods are filled.
Potatoes	1.5 – 2.5	Tuber initiation. Repeat at 10 to 14 day intervals until maximum tuber development has occurred.
Rice	2.0 – 3.0	Panicle initiation. Repeat if needed.
Small Grains	1.5 – 2.5	Tillering through flag leaf emergence.
Soybeans	1.5 – 2.5	Early pod formation. Repeat in 14 to 21 days.
Sugar Beets	2.0 – 3.0	10 to 12 leaf stage. Repeat at 20-leaf stage.
Sunflower	1.5 – 2.5	When outer seeds start to fill. Repeat in 10 to 14 days.
Tobacco	1.5 – 2.5	Plant bed stage to near maturity as needed to maintain crop growth and quality.
Other field crops	1.0 – 1.5	When sufficient foliage is present or at early fruit set. Slightly higher rates may be necessary.

Ground Foliar Application: Apply with a minimum of 5 gallons of water per acre or more for good coverage.

Aerial Foliar Application: Apply with a minimum of 2 gallons of water per acre or more for good coverage.

Fertigation for above crops:

Center Pivot and other Sprinkler Systems: Apply 3 to 5 gallons per acre per application every 10 to 14 days as needed.

Drip Irrigation: Apply 3 to 5 gallons per acre per application 3 to 6 times during the growing season as needed.

Note: When mixing Super 72 with additional nitrogen or NPK solutions for foliar application use only low biuret urea for nitrogen or Nutra-Flo PureGrade NPK liquid fertilizers to minimize potential for plant tissue burn.

TABLE 2. VEGETABLES AND GARDEN FRUITS

Suggested foliar application rates and time of application for Nutra-Flo Super 72 Nitrogen.

CROP	GALLONS/ACRE	TIME OF APPLICATION
Asparagus	1.5 – 2.5	At mid-fern development and repeat at 14 to 21 day intervals.
Beans, Green & Lima	1.0 – 1.5	At early flowering and repeat in 7 to 10 days.
Broccoli, Brussels Sprouts, Cabbage & Cauliflower	1.5 – 2.5	Prior to head formation and repeat in 10 to 14 days.
Carrots	1.0 – 1.5	When plants are 3 to 6 inches tall, repeat at three-week intervals or as required.
Celery	1.0 – 1.5	When plants are 8 to 12 inches tall and repeat at 10 to 14 day intervals.
Corn, Sweet	1.0 – 1.5	When plants are 12 to 24 inches tall, then at tassel emergence and repeat after pollination.
Cucumber, Melons & Squash	1.5 – 2.5	Early flowering and repeat at 10 to 14 day intervals.
Kale	1.5 – 2.5	When sufficient foliage is present.
Lentils	1.0 – 1.5	Early flowering. Repeat at 10 to 14 day intervals.
Lettuce	1.0 – 1.5	After thinning, then at early head formation. Repeat at 10 to 14 day intervals.
Okra	1.0 – 1.5	Bud stage. Repeat at 10 to 14 day intervals.
Onion and Garlic	1.5 – 2.5	Mid-set development. Repeat at 14 to 21 day intervals.
Peas	1.5 – 2.5	Early flowering. Repeat in 10 to 14 days.
Peppers	1.5 – 2.5	Early fruit set. Repeat at 10 to 14 day intervals.
Spinach	1.5 – 2.5	When sufficient foliage is present and repeat at 10 to 14 day intervals.
Tomatoes, Process & fresh	1.5 – 2.5	At full bloom. Repeat at 10 to 14 day intervals.
Other vegetable crops	1.0 – 1.5	When sufficient foliage is present or at early fruit set. Higher rates may be necessary.

Ground Application: Apply with a minimum of 10 gallons of water per acre or more for good coverage.**Aerial Application:** Apply with a minimum of 4 gallons of water per acre or more for good coverage.**Fertigation for above crops:****Sprinkler Irrigation:** Beginning at the 3rd to 4th leaf stage, apply 2 to 5 gallons per acre per application every 10 to 14 days.**Drip Irrigation:** Apply 2 to 5 gallons per acre per application 3 to 6 times during the growing season.**Note: When mixing Super 72 with additional nitrogen or NPK solutions for foliar application, use only low biuret urea for nitrogen or Nutra-Flo PureGrade NPK liquid fertilizers for best results and crop safety.****TABLE 3. FRUITS, BERRIES, NUTS & CHRISTMAS TREES**

Suggested Foliar application rates and time of application for Nutra-Flo Super 72 Nitrogen.

CROP	GALLONS/ACRE	TIME OF APPLICATION
Almond, Filbert, Pecans and Walnuts	1.5 – 2.5	At full leaf. Repeat at early nut expansion.
Apples	1.0 – 1.5	Begin at first full leaf and repeat at early fruit color.
Blueberry	1.0 – 1.5	Early fruit set and repeat at early fruit color.
Caneberries	1.0 – 1.5	Prior to fruit set.
Cherries, Peaches, Pears & Plums	1.0 – 1.5	Prior to fruit set.
Citrus	1.5 – 2.5	Early bloom. Repeat after fruit set.
Winter rate	4.0 – 10.0	Apply in mid-January and repeat as required.
Cranberry	1.0 – 1.5	Hook stage. Repeat after fruit set.
Grapes, Table	1.0 – 1.5	Prior to fruit set.
Grapes, Raisin	1.0 – 1.5	When sufficient foliage is present. Repeat as needed.
Grapes, Wine	1.0 – 1.5	When sufficient foliage is present. Repeat as needed.
Olives	1.0 – 1.5	Early fruit development. Repeat as needed.
Strawberries	1.0 – 1.5	Early flowering and repeat every 14 days through harvest. Initiate fall application when new growth reaches 3 inches in height.
Other fruit or nut crops	1.0 – 1.5	When sufficient foliage is present or at early fruit set. Higher rates may be necessary.

Christmas Trees**Foliar:** 1.0 to 1.5 gallons per acre as needed or at 14 to 21 day intervals.**Ground Application:** Apply with a minimum of 5 gallons of water per acre or more for good coverage.**Aerial Application:** Apply with a minimum of 2 gallons of water per acre or more for good coverage.**Fertigation:****Sprinkler Irrigation:** Apply 2 to 4 gallons per acre per application every 10 to 14 days or as needed.**Drip Irrigation:** Apply 2 to 4 gallons per acre per application 3 to 6 times during the growing season.**Concentrate or Dilute Spray****Nutra-Flo Super 72 nitrogen** may be applied in a concentrate spray (50 to 100 gallons of water) or dilute spray (200 to 400 gallons of water).**Note: When mixing Super 72 with additional nitrogen or NPK solutions for foliar application, use only low biuret urea for nitrogen or Nutra-Flo PureGrade NPK liquid fertilizers for best results and crop safety.**