

DISTRIBUTED BY:

PRODUCTS AVAILABLE

PHOSGARD

0-28-25

Available Phosphoric Acid (P_2O_5)
(AOAC Method 960.02)...28%
Soluble Potash (K_2O)...25%
Derived from phosphorous acid,
potassium hydroxide
For soil and/or foliar application

PHOSGARD

0-40-0

Available Phosphoric Acid (P_2O_5)
(AOAC Method 960.02)...40%
Derived from phosphorous acid
For soil application

PHOSGARD

0-60-0

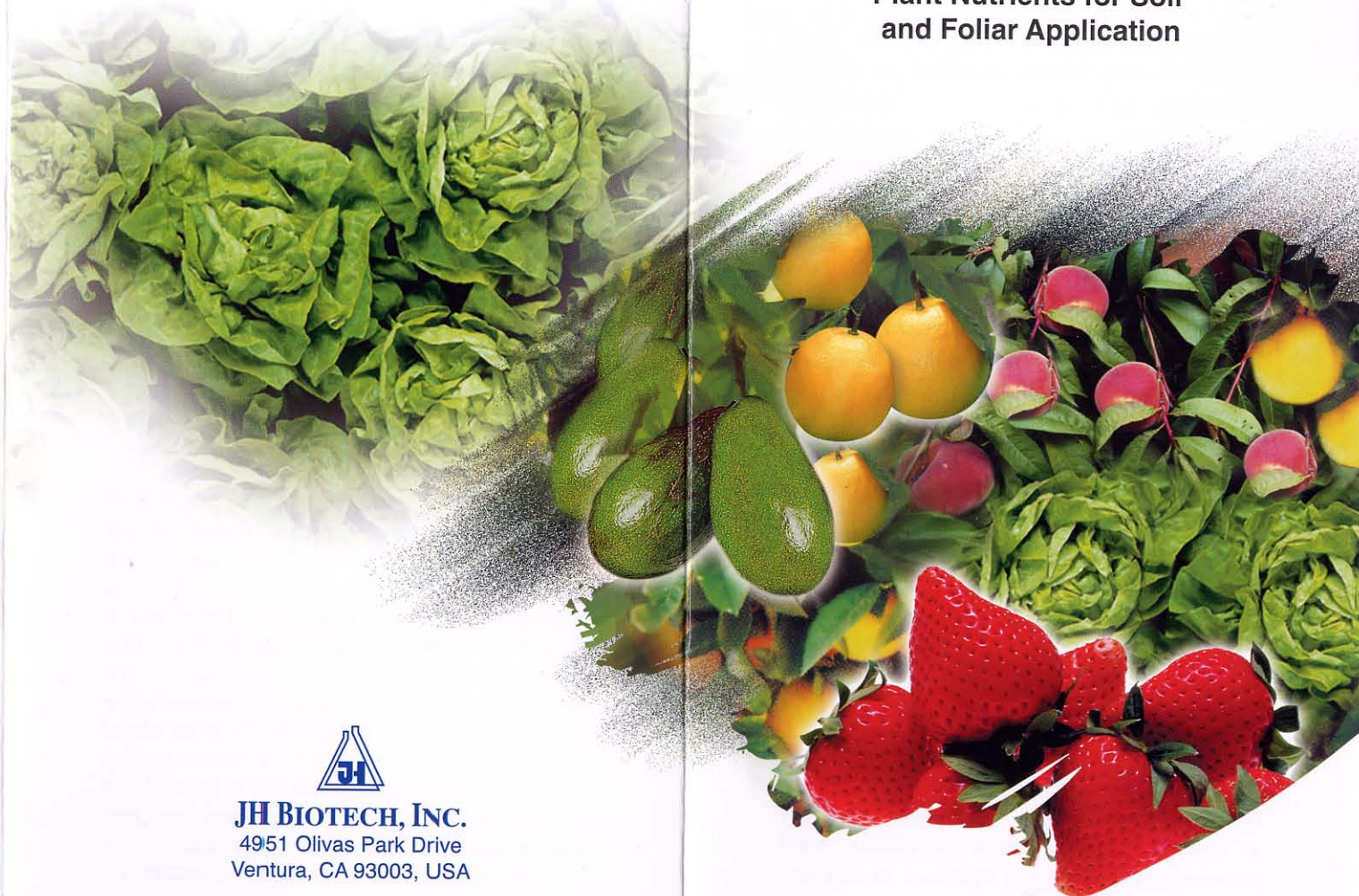
Available Phosphoric Acid (P_2O_5)
(AOAC Method 960.02)...40%
Derived from phosphorous acid
For soil application

PHOSGARD

4-25-15

Total Nitrogen (N) 4%
4% Urea Nitrogen
Available Phosphoric Acid (P_2O_5)
(AOAC Method 960.02)...25%
Soluble Potash (K_2O)...15%
Derived from phosphorous acid, potassium
hydroxide and urea
For soil and/or foliar application

Manufactured under US Patent #5,707,418



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PHOSGARD™

Plant Nutrients for Soil
and Foliar Application



JH Biotech, Inc.

Biotechnologies for Safer Agriculture

PHOSGARD™ contains plant nutrients designed for soil and/or foliar applications. The phosphorus contained in **PHOSGARD™** is derived from phosphorous acid, making it different from the traditional phosphate fertilizer derived from phosphoric acid or its salts.

Phosphorous acid is less oxidized than phosphoric acid. When neutralized by alkaline substances such as potassium hydroxide, it becomes phosphite salt, which is different from phosphate salt derived from phosphoric acid.

PHOSPHORUS NUTRITION

Phosphorus is one of the major elements essential for plant growth. Phosphorus is a constituent of many compounds in plants and is involved in various metabolic processes. It is used by plants to form nucleic acids (DNA and RNA) and in storage and transfer of energy through energy-rich compounds, ADP and ATP. Energy-rich phosphate bonds provide energy for synthesis of compounds such as sucrose, starch and protein.

Upon foliar application, the phosphite ions are taken up directly by the plant foliage and may undergo a degree of conversion to phosphate ions, or be utilized directly by the plants, as phosphite ions. As a soil application to annual crops, a lesser response from the initial crop, with a corresponding superior response from succeeding crops, may be observed. In addition, placement close to seed or root zones may be injurious to crops. The effect may be aggravated by a soil pH below 6.5.

Phosphorus has favorable effects to plants on the following:

- (1) cell division, fat and albumin formation
- (2) flowering, fruiting and seed formation
- (3) crop maturation, thus counteracting the effect of excess nitrogen
- (4) root development
- (5) strength of straw in cereal crops to prevent lodging
- (6) crop quality, especially of forages and of vegetables
- (7) resistance to certain diseases

PHOSPHORUS AVAILABILITY

In natural ecosystems phosphorus is usually a life-limiting element due to its low availability. In low pH soils, phosphorus reacts with iron and aluminum to form low solubility iron phosphate and aluminum phosphate, which are relatively unavailable to the plants. In calcareous soils, phosphorus reacts with calcium to form calcium phosphates which are either slightly soluble or insoluble in soil solutions and are also unavailable to plant uptake.

Large amounts of phosphorus in soils are present in their organic form. However, these are not readily available to plants. These phosphates must be released by the action of phosphatases present in roots or microorganisms. The supply of phosphorus from the soil is usually insufficient for normal growth of commercial plants. This insufficiency of phosphorus is usually overcome by applying phosphorus fertilizers. Because of soil conditions, soluble phosphorus fertilizers applied to the soil are very rapidly changed to less-soluble compounds which, with time, become less and less available to plants. The availability of phosphorus is affected by the following factors:

- (1) soil pH
- (2) forms of phosphorus applied
- (3) soil texture and other properties
- (4) soil microorganisms
- (5) organic matter content

PHOSPHORUS FERTILIZERS

Phosphorus is one of the most difficult nutrients to supply to plants for the following reasons:

- (1) phosphorus fixation in the soils
- (2) poor uptake of foliar applied phosphorus

To compensate for the inefficiency of phosphorus utilization by plants it is necessary to apply high doses of fertilizer when relatively small quantities of phosphorus are being removed. Technologies which can improve the efficiency of phosphorus can greatly reduce the quantities of phosphorus application. Phosphorus supplementation is most required by crops under these conditions:

- (1) growth in cold weather
- (2) limited root growth
- (3) fast top growth

PHOSGARD APPLICATION

PHOSGARD™ can be applied to all crops. Seedlings should have 3-4 true leaves before first application. Label instructions include drench, sprinkler, drip, foliar and dipping rates. For sprinkler, foliar and drip applications repeat every 2-4 weeks.

PHOSGARD™ can be applied to all types of nursery crops. The label includes directions for foliar, sprinkler, drip, drench and root dip applications. Plants should have an established root system before the first application and make sure no copper residue is present when application is made.

PHOSGARD™ application on turf, greens and fairways should be made every 2-4 weeks during the summer. The first application should be made to established turf in the spring when temperatures begin to warm up. Applications should be made throughout the season until temperatures drop or the first snow fall. In warmer climates, applications should be made year round. Do not apply Phosgard to newly seeded turf. First application should not be made until after the first cutting.