



**JH Biotech**  
Biotechnologies for Safer Agriculture

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# PHOSGARD®

Plant Nutrients for Soil and Foliar Application



**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

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.

***Phosphorus has favorable effects to plants in the following:***

- (1) Crop maturation
- (2) Root development
- (3) Resistance to certain diseases
- (4) Cell division, fat and albumin formation
- (5) Flowering, fruiting and seed formation
- (6) Crop quality, especially of forages and vegetables
- (7) Strengthen straws in cereal crops to prevent lodging

## 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



\* This flyer is not valid in Oregon.

## Phosphite Fertilization

The benefits of Phosphite ( $\text{PO}_3$ ) fertilization have been well documented and observed for more than two decades now. Phosphite based fertilizers have grown very popular and are now part of many standard nutrition programs. Phosphite fertilizers have several advantages over phosphate base fertilizers. Phosphites are not tied up in the soil as phosphates are. The phosphite ions are able to remain in the soil solution and are easily taken up by both plant roots and foliage. Phosphites are ideal for foliar application because they pass readily through the cuticles of the leaves and are transported through both the phloem and xylem. Phosphites are slowly converted inside the plant and in the soil to phosphates, making phosphites act as a slow release phosphorus source. Phosphites also help boost the immune system of plants and can have a positive effect on plant vigor and growth. Phosphites also stimulate root development which can lead to healthier, more productive top growth.



### Products Available

**PHOSGARD® 0-28-25**

**PHOSGARD® 0-32-25**

**PHOSGARD® 0-40-0**

**PHOSGARD® 0-60-0**

**PHOSGARD® 2-40-16**

**PHOSGARD® 4-25-15**



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### Effect of Phosgard® on Root Growth

Phosgard simulates early growth and root formation.



## 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.