

# RESEARCH LABORATORY TECHNICAL REPORT



## Potassium Phosphite Plant Health Care Applications

By Drew Zwart, PhD, Plant Physiology

Potassium phosphite is a soil applied material that has recently gained attention as a method for improving plant vigor and health. Research and field experience have shown that this improvement of plant health after application of potassium phosphite is related to an increase in resistance against a variety of plant pathogens, as well as increased tolerance of many environmental stress factors, including drought stress.

### What is potassium phosphite?

The chemical formula of potassium phosphite is  $H_2KO_3P$ . Various products containing potassium phosphite are sold as either fertilizers to address potassium deficiencies, or as fungicide products to manage specific disease issues. Potassium phosphite has the unique property of increasing resistance against several disease and environmental stress issues by boosting both the rate and intensity of the existing plant defense systems.

### How does this work?

Application of potassium phosphite enhances the plants' existing defense responses. This includes the formation of necrotic zones (programmed cell death to limit pathogen spread), production of plant hormones involved in defense, production of defense lytic enzymes, thickening of cell walls, and phytoalexin (antibody) production. Interestingly, this increase in plant resistance extends beyond the time-frame when the material is detected in plant tissue, indicating a systemic 'immunization' effect.

### Phosphite vs. Phosphate

The phosphite component of this material affects plants in a manner that is different than the common phosphorous fertilizer, phosphate. While chemically similar, phosphite is far more mobile in plant tissue,

and does not actually provide appreciable phosphorous to the plant. This is not a concern because across North America, it is very rare to find landscape soils that are actually lacking in phosphorous. Phosphate is also a common source of fertilizer contamination of water, but this is not a concern with phosphite.

### How is potassium phosphite applied?

As a fully systemic material, phosphite can be applied as a foliar spray, a soil injection for root uptake, or as a bark spray, depending on the situation and specific goal. Following any of these applications, the effects of the potassium phosphite can be seen throughout all plant parts. Rates and application equipment vary depending on application type.

### Where should potassium phosphite be used?

1. Management of specific soil borne diseases, including *Phytophthora* root disease and *Armillaria* root rot.
2. As a direct treatment for bleeding cankers on tree trunks, including those caused by *Phytophthora* species and some bacterial species.
3. As a means of enhancing general resistance against a variety of secondary or 'stress-related' pathogens.
4. To promote general plant vitality.
5. To enhance resistance against environmental stress factors such as drought or water-logged soils.