



Fungicide • Bactericide • Miticide

Technical Information

All Phase prevents and controls a wide range of bacterial and fungal pathogens (Table 1) through an array of scientifically supported modes of action.

1. Inhibits spore germination (Sofos, 1989).
2. Disrupts cell membrane integrity (Statham and McMeekin, 1988).
3. Changes cell morphology (Seward et al., 1982).
4. Alters cell membrane permeability (Sheu and Freese, 1972).
5. Inhibits cell metabolism (York and Vaughn, 1964).
6. Impedes function of cellular enzymes (Sheu et al., 1975).
7. Obstructs electron transport functions resulting in cell starvation (Deak et al., 1970) from a reduction in cellular ATP (Anderson and Costilow, 1963).
8. Increases surface tension at cell membrane (Cerkaukas & , Ferguson. (2014): Yu, Ju-Hyun et al. 2009).
9. Inhibits the production of mycotoxins in post-harvest fruits and vegetables (Bhattachrya and Majumdar, 1984).
10. Locks active ingredients in a protective shield around plant surfaces (Circadian Crop Sciences LLC—US Patent Application #16378874).

Table 1. Some Pathogens Inhibited or Controlled by Active Ingredients in All Phase	
Organism	Citation
Bacteria	
<i>Pseudomonas fluorescens</i>	Robach, 1978
<i>Pseudomonas fragii</i>	Moustapha and Collins, 1969
<i>Alteromonas putrefaciens</i>	Robach, 1979
<i>Aerobacter aerogenes</i>	Wallhaeusser and Lueck, 1972
<i>Proteus morgani</i>	Taylor and Speckhard, 1984
<i>Clostridium sporogenes</i>	Vareltzis et al., 1984
<i>Clostridium botulinum</i>	Sofos et al., 1986
<i>Salmonella</i> spp.	Larocco and Martin, 1981
<i>Staphylococcus</i> spp.	Lahellec et al., 1981
<i>Yersinia enterocolitica</i>	Tsay, 1989
<i>Listeria monocytogenes</i>	El-Shenawy and Marth, 1988
<i>Penicillium roqueforti</i> and <i>Aspergillus parasiticus</i>	Liewen and Marth, 1983
<i>Bacillus cereus</i>	Smoot and Pierson, 1981

Fungi	
Chaetomium globosum and Alternaria alternate	Bellotti et al., 2013
Candida spp.	Deak and Novak, 1968
Aspergillus flavus, A. fumigatus, A. Niger	Mutasa et al., 1990
Fusarium oxysporum	Ragab et al., 2012
Rhizopus stolonifera, Aspergillus niger, Penicillium chrysogenum, Mucor sp.	Kumar, D. P. et al. 2015
Botrytis cineria	Feliziani et al. 2013
Monilia fructigena, Botrytis cinerea, Rhizoctonia solani, Phytophthora capsici, Alternaria solani	Nikolov and Ganchev, 2011
Thielaviopsis basicola	Punja, Fraser, and Gaye, 1993
Alternaria spp.	Bellotti et al., 2013

Russet Mites

Invitro testing of All Phase on hemp russet mites (*Aculops cannabicola*) provided 100% mortality within 48 hours. With good spray coverage All Phase should control russet mites.

Spider Mites

All Phase knocked down populations of two-spotted spider mites (*tetranychus urtica*) on pansies and chrysanthemums, but populations rebounded too quickly for us to recommend for controlling spider mites

Insects

All Phase provided inadequate control of cotton melon aphids (*aphis gossypii*) on chrysanthemums, and of cabbage aphids (*Brevicoryne brassicae*) on cabbages. The product can immobilize and kill greenhouse whitefly adults (*Trialeurodes vaporariorum*), but without help from beneficial insects (i.e. *Encarsia Formosa*) we don't see it providing commercially viable results. From our limited testing we are unable to recommend All Phase as an insecticide. In applying All Phase on labelled pests, you may notice some efficacy of the product against other pests. We'd love to hear about it.

Notes:

1. Even though All Phase is totally comprised of ingredients the FDA identifies as GRAS (Generally Recognized as Safe), please follow all safety precautions outlined on the product label. Your eyes are precious and especially fragile. Never spray any pesticide without wearing eye protection.
2. Give the product a good five minutes of vigorous agitation prior to application to activate the polymers and prevent clumping.
3. Maintain agitation throughout the spray.
4. The viscosity of the spray solution will vary depending upon the rate at which All Phase is mixed with water.
5. As All Phase is more viscous than water, applicators may have to increase spray pressure and/or nozzle size.
6. Don't let the product sit for hours in a spray tank without agitating the spray solution every fifteen minutes or so, and thoroughly clean spray rig, flushing fresh water through lines, at end of application.

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