



## Cannabis Production: Disease, Insect & Nutrition Management

Disease Control				
Product and Target	Seeding/Rooting	Vegetative	Flowering	Pre-Harvest
RootShield® PLUS <sup>+</sup> WP (roots) <b>Major damping off, root rot and wilt diseases</b>	Drench seed/rooting trays: <ul style="list-style-type: none"> <li>• 6 oz/100 gal</li> <li>• 8.2 g/5 gal (1.3 Tbsp)</li> <li>• 1.6 g/1 gal (1 level tsp)</li> </ul>	Drench at stepping up: <ul style="list-style-type: none"> <li>• 6 oz/100 gal</li> <li>• 8 g/5 gal</li> </ul>	Drench/drip 6-8 weeks after last application: <ul style="list-style-type: none"> <li>• 6 oz/100 gal</li> <li>• 8 g/5 gal</li> </ul>	
		Hydroponics Systems: Drench/drip every 4 weeks		
RootShield® PLUS <sup>+</sup> G (roots) <b>Major damping off, root rot and wilt diseases</b>	Incorporate into growing media: <ul style="list-style-type: none"> <li>• 1.5 lb/1 cu yd of mix</li> <li>• 25 g/1 cu ft of mix (0.9 oz) (3 Tbsp)</li> </ul>		Apply RootShield PLUS <sup>+</sup> WP for reapplication 6-8 weeks after seeding or sticking cuttings.	
CEASE® (foliar) <b>Leaf spot, powdery mildew</b>	See <b>Table 1</b> for Powdery Mildew and Botrytis Protocol.	Weekly Foliar Spray: <ul style="list-style-type: none"> <li>• 4-6 qt/100 gal</li> <li>• 1.28-1.92 fl oz/1 gal (38-57 ml) (2.5-3.75 Tbsp)</li> </ul> Shake well before use. Can be tank-mixed with MilStop.		Suspend applications 3 weeks prior to harvest.
MilStop® SP (foliar) <b>Leaf spot, powdery mildew</b>		Weekly Foliar Spray: <ul style="list-style-type: none"> <li>• 1.25-2.5 lb/100 gal/43,560 sq ft</li> <li>• 7-14 g/1 gal/500 sq ft (0.5-1 Tbsp)</li> </ul> Spray to glisten, not to wet or runoff. Do not add surfactant.		
BotryStop™ (foliar) <b>Botrytis</b>		Foliar spray at onset of flowering: <ul style="list-style-type: none"> <li>• 3 lb/100 gal/43,560 sq ft</li> <li>• 13.6 g/1 gal (5 tsp)</li> </ul> Preventative application. Spray early into flowering. Use low rate of a wetting surfactant for best coverage.		Suspend applications 4 weeks prior to harvest.
PERpose Plus™ <b>General sanitation, foliar and soil borne diseases</b>	Dip cuttings to disinfect: <ul style="list-style-type: none"> <li>• 1:300</li> </ul> Algae control spray tops of blocks: <ul style="list-style-type: none"> <li>• 1:100</li> </ul>	Algae control spray tops of blocks: <ul style="list-style-type: none"> <li>• 1 fl oz (29.5 ml)/1 gal</li> </ul> Irrigation Water: <ul style="list-style-type: none"> <li>• 1:1,000 to 1:10,000 or 128 fl oz to 12.8 fl oz /1,000 gal</li> </ul> Foliar Spray: <ul style="list-style-type: none"> <li>• Preventative and early flowering: 1:300 or 9.8 ml/gal</li> <li>• Curative and late flowering: 1:100 or 29.5 ml/gal</li> </ul>		Clean up foliar spray: <ul style="list-style-type: none"> <li>• 1:100</li> </ul> 2 applications prior to harvest.

*NOTE: Product use on Cannabis is subject to state law*



**Table 1.**

**Powdery Mildew and Botrytis Protocol**

Beginning early in vegetative growth (week 2-3), begin a rotation of CEASE + MilStop and PERpose Plus at 1:300. Week 1 into flowering, begin rotating BotryStop + spreader-type adjuvant with CEASE + MilStop. Apply products with fine nozzle and high pressure to contact all surfaces of the plant. Spray to glisten, avoid runoff. All products may be used in a low volume application. See [www.bioworksinc.com](http://www.bioworksinc.com) for fogging rates.

Suspend applications 3-4 weeks prior to harvest and conduct weekly clean up sprays with PERpose Plus at 1.0 fl oz/gal.

Insect Control				
Product and Target	Seeding/Rooting	Vegetative	Flowering	Pre-Harvest
NemaShield® <b>Fungus gnats, soil dwelling lifestage thrips</b>	Drench seed/rooting trays: • 100 million/100 gal/3,400 sq ft	Drench every 14 days starting at stepping up: • 100 million/100 gal/3,400 sq ft		
BotaniGard® 22WP or Mycotrol® WPO * (foliar) <b>Aphids, thrips, whiteflies, caterpillars</b>	Foliar spray to glisten every 7-14 days: • 1 lb/100 gal • 4.5 g/1 gal (1 Tbsp) Sprench or stem spray every 7- 14-days for soil dwelling insects: • 1 lb/100 gal See <b>Table 2</b> for root aphid protocol		Suspend foliar applications 3 weeks prior to harvest.	
BotaniGard® MAXX (foliar) <b>Mites, aphids, thrips, whiteflies, caterpillars</b>	Foliar spray to glisten on a 7-10-day interval: • 0.5-1 qt/100 gal • 4.8-9.5 ml/1 gal (1-2 tsp) • Use in rotation with BotaniGard 22WP or Mycotrol WPO Sprench or stem spray on 14-day interval for soil dwelling insects: • 0.5 qt/100 gal See <b>Table 2</b> for root aphid protocol.			
Molt-X® (foliar) <b>Aphids, thrips, whiteflies, caterpillars</b>	Foliar spray to glisten on a 7-10-day interval: • 4-8 fl oz/100 gal • 1.2-2.4 ml/1 gal (1/4-1/2 tsp) Use in rotation (8 fl oz) or combination (4 fl oz) with BotaniGard 22WP or Mycotrol WPO. See <b>Table 2</b> for root aphid protocol			
SuffOil-X® (foliar) <b>Mites, aphids, thrips, whiteflies</b>	Foliar spray to glisten on a 7-10-day interval: • 4 qt/100 gal • 37 ml/1 gal (1.25 fl oz) (2.5 Tbsp) Use caution when spraying during flowering. Turn lights off during spray, have fans running for 1-2 hours dry time and avoid high humidity. Use fine droplet size and avoid runoff.		Suspend applications 1 week prior to harvest.	

\*BioWorks recommends BotaniGard 22WP or Mycotrol WPO formulations for foliar and/or soil applications on Cannabis.

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**Table 2.**

**Root Aphid Protocol**

At first signs of root aphids apply BotaniGard 22WP at 2 lbs/100 gal (2 Tbsp/1 gal) applied 2-3 times, 3-5 days apart. Apply 1 lb/100 gal every 7-10 days once population level is under control. Use approximately 15 fl oz (500 ml) of spray solution per gallon of media. BotaniGard 22WP may be tank-mixed with Molt-X at 4 fl oz/100 gal.

Conduct foliar applications every 7-14 days with BotaniGard 22WP rotated with SuffOil-X to target winged adults.

BotaniGard Maxx applied as a sprenc should only be used for plants growing in soil-based media. Do not apply to rockwool or soilless media. Do not exceed 1 qt/100 gal or apply more than once in a 14-day interval.

Suspend applications 3-4 weeks prior to harvest and conduct weekly clean up sprays with PERpose Plus at 1.0 fl oz/gal.

*Do not drench BotaniGard® ES or Mycotro® ESO or BotaniGard® MAXX onto roots growing in rockwool or Hydroton® (baked clay pellets) growing media.*

Plant Nutrition				
Product	Seeding/Rooting	Vegetative	Flowering	Pre-Harvest
ON-Gard® (foliar or root)	Apply to stock plants prior to cuttings. Foliar spray or drench on a 2-3-week interval: <ul style="list-style-type: none"> <li>• 16-32 fl oz/100 gal</li> <li>• 5-10 ml/1 gal (1-2 tsp)</li> </ul>			Suspend applications at nutrient flushing.
ON-Gard® Calcium (foliar only)		Foliar spray weekly up to flowering: <ul style="list-style-type: none"> <li>• 8-16 fl oz/100 gal</li> <li>• 2.4-4.8 ml/1 gal (1/2-1 tsp)</li> </ul>		
Verdanta® EcoVita® 7-5-10		Soil blend <ul style="list-style-type: none"> <li>• 8 lb/1 cu yd</li> </ul>	Top dress after 4-6 weeks: <ul style="list-style-type: none"> <li>• 10 g/1 gal media</li> </ul>	
Verdanta® N-Vita® 9-4-3	Soil blend: <ul style="list-style-type: none"> <li>• 2 lb/1 cu yd</li> </ul>	Soil blend: <ul style="list-style-type: none"> <li>• 6.5 lb/1 cu yd for vigorous clones (half rate for dwarf clones)</li> </ul>	Top dress after 4-6 weeks: <ul style="list-style-type: none"> <li>• 8 g/1 gal media vigorous clones (half rate for dwarf clones)</li> </ul>	
Verdanta® K-Vita® 2-0-20		Soil Blend: <ul style="list-style-type: none"> <li>• 5 lb/1 cu yd</li> </ul>	Top dress after 4-6 weeks: <ul style="list-style-type: none"> <li>• 7 g/1 gal media</li> </ul>	
Verdanta® PL-2 2-0-6		Through the drip line weekly (NOT for recirculating systems): <ul style="list-style-type: none"> <li>• 22.3 fl oz (0.66 L) /100 gal</li> </ul>	Through the drip line weekly (NOT for recirculating systems): <ul style="list-style-type: none"> <li>• Transition to 45 fl oz /100 gal (1.33 L)</li> </ul>	Suspend applications at nutrient flushing.

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OMRI Listed (Organic) Biofungicides			
BotryStop™	RootShield® PLUS+ WP	RootShield® PLUS+ G	CEASE®
MilStop® SP			
OMRI Listed (Organic) Bioinsecticides		WSDA Listed (Organic) Bioinsecticides	
Molt-X®	SuffOil-X®	Mycotrol® WPO	
OMRI Listed (Organic) Plant Nutrition			
ON-Gard®	Verdanta® EcoVita® (7-5-10)	Verdanta® N-Vita® (9-4-3)	Verdanta® K-Vita® (2-0-20)
ON-Gard® Calcium	Verdanta® PL-2 (2-0-6)		

Product use on Cannabis is subject to state law. Refer to product labels for complete application details. Additional technical information is available on our website ([bioworksinc.com](http://bioworksinc.com)) or from your BioWorks solutions advisor. Always read and follow label directions.