ENVIRONMENTAL PLANT MANAGEMENT™
SCIENCE IN STEP WITH NATURE

Protection Plus®

Protection Plus™ Pesticide
Quick Reference Manual (Revision #12)

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ENVIRONMENTAL PLANT MANAGEMENT™
SCIENCE IN STEP WITH NATURE

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General Information

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Specific Insect Control Information

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% Of Insect Kill on 1st Application (Independent Research Lab Results)

Adolescent mites (Russet, Broad, Spider, etc.) and most adult pests will die quickly. Having said that, *insects that have **not been** coated properly with* Protection Plus™ may live up to 24 hours before death or not die at all. It is important to take the time to fully coat leaf, stem, underside of the canopy, and soil surfaces to obtain the best results.

Using a good stereo microscope, you can see the pests dying right in front of your eyes after proper application. Take the time to do a proper application.

Aphids may never move once they have been in contact with Protection Plus™. This may appear like they are still alive but upon closer inspection, they are dead and can be brushed from the leaf.

Independent research laboratory results:

Insect	First Application Kill Rate
Whiteflies	99%
Thrip	90%
Russet Mites	98%
Aphids	98%
Spider Mites	87%

As you can see, Protection Plus™ is extremely good at killing insects, arguably the best pesticide in the industry today for application on food crops that require Federal and State testing. Following the application instructions will lead you to a 100% kill. You will never be able to stop insects from coming into the growing area, it is impossible to do. What you can do is use Protection Plus™ weekly to suppress insects that do come into the growing area from the outdoors. Continuous applications of Protection Plus™ is part of IPM (Integrated Pest Management) and should be considered a cost of doing business.

Other in-house research results. Independent Research Laboratory testing in progress.

Protection Plus is a broad-spectrum insecticide for all soft-bodied insects and is effective on Scorpions, Ants, Spiders, and other insects found on or around plants. As an example, spraying coffee bushes before harvest can greatly reduce worker complaints of stinging insects.

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IPM Integrated Pest Management

IPM Integrated Pest Management and its value

Pests are not a sign that the growers are unclean or not doing their job properly, in fact, finding pests on the plants is completely natural and expected. No matter how hard the growers try to keep pests off of their plants, pests will always be in the fields and greenhouse. However, it is the art of keeping pests under control that secures reputation and market share for growers. A farm/greenhouse needs eyes on the plants to determine what kind of pest is on the crop, what the severity of the pest population is, and what type of treatment is needed to contain the spread of the pest. It is the role of every professional applicator to communicate to the grower the value of having a continuously operating pest management program or IPM.

What is the meaning of IPM?

The definition of Integrated Pest Management can be broken down into examples like this:

A. ***Integrated*** refers to the combining or coordinating of separate elements to provide a harmonious, interrelated method of control.
   1. Check incoming plants for pests and apply pesticides whether they need it or not. Notify suppliers if pests are found. A quarantine area is advised for all incoming plants before integrating with the crop.
   2. Check incoming visitors and employees for pests.
      - The change of clothing may be required for employees with their own private gardens or if they live in the country near fields or farms.
   3. Immerse the soles of shoes in a sanitizing agent before entering indoor areas.
   4. Spray Protection Plus™ on leaves, stems, the surface area under the canopy, walkways, and delivery docks regularly.

B. ***Pest*** refers to the insects or micro-organisms that are detrimental to the continued success of the business.
   1. It is important to identify the pest or pests that you will be dealing with.
   2. Use a laboratory-grade trinocular stereomicroscope that utilizes a high-definition camera for identification. Using anything less than a lab-grade microscope with 180x is unacceptable. Take pictures before and after treatment to prove the controllability of the pests. Log the results with the date and time.
   3. Should you be asked, be prepared to issue photographic proof of the controlled pest to your client.

C. ***Management*** refers to the continuous overseeing of pest control on an hourly basis 7

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days a week to ensure business success.

1. Look to the Protection Plus™ application directions in this manual and devise a preliminary treatment after diagnosing the pest population.
2. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.
3. After the pests have been brought under control, treat the area every 7 days. Examine the leaves, stems, and under-canopy areas of the plants.
4. Treatment schedules need to be written and followed without pause. Treatment schedules need to be posted noting the week, day, time, and duration of the application for employee awareness.
5. Remove employees from the area while treatment is going on. Allow them to return once the product has dried.
6. Spraying pesticides at low dosage levels regularly lowers the chances of a devalued crop dramatically.
7. Consistent quality harvests guarantee a secure market share. A devalued crop from pest attack reduces quality and market share.
8. The cost of an IPM program is less than the cost of losing market share and reputation.
9. Only watchful eyes in the field can keep pests under control.

Rotation

1. Protection Plus™ is a breakthrough pesticide in that insects can't adapt to its effectiveness. You do not need to rotate pesticides, Protection Plus™ when used as directed, will continue to kill the pests you are treating for years to come without losing any effectiveness!
    A. Using only one pesticide will reduce the chances of phytotoxicity from using multiple pesticides.
    B. Employees will learn and become familiar with only one pesticide.
    C. The plants will have less stress with less of a chance of slowing plant growth.
2. Protection Plus™ may be used in any rotational program. There are so many pesticides with multiple ingredients it is hard to say whether or not any phytotoxicity will occur when mixed with one or more pesticides. It is always best to spray a portion of a plant and wait 24-48 hours and look for signs of toxicity before applying Protection Plus™ to the entire crop. This procedure is standard operating procedure for all pesticides.

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Formulation Quality Control (Independent Research Lab Results)

We made it our job to manufacture a pesticide that is not only extremely effective and inexpensive but also make sure that it doesn't contain any ingredient that would fail lab testing. It wasn't easy but we did it! Many harmful chemicals can fail a lab test, the problem is, many states will add a harmful chemical to their list without a lot of notice. It may seem like one day a questionable chemical is not on the state's radar, the next day the same chemical will be deemed harmful, and you will fail your testing. We at Environmental Plant Management are trying to foresee the future by testing for ingredients that have already been deemed harmful **and** also testing for ingredients that we believe **will be** deemed harmful in time**.** By testing our pesticide for adverse ingredients, we can assure the grower, distributor, field consultant, and retailer that Protection Plus™ will not cause a grower to fail a lab test due to the ingredients listed below.

To help assure growers that they will pass lab testing, Protection Plus™ is independently lab-tested for the ingredients listed below:

- Questionable significance: *Glyphosate*
- Heavy Metals: *Antimony, Arsenic, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium*
- Microbiology: *Total Living Coliforms, Mold, Yeast, Aerobic Plate Count, Salmonella, E. coli, and Staphylococcus*
- Chemicals with adverse history or deemed inappropriate:

2,4-DP (Dichlorprop)

2,4,5-TP

Acephate

Acequinocyl

Acetamiprid

Acetochlor

Acifluorfen

Acrinathrin

Alachlor

Aldicarb

Aldicarb sulfoxide

Aldoxycarb (Aldicarb-sulfone)

Aldrin

Ametryn

Aspon

Atrazine

Atrazine-desethyl

Avermectin B1a/B1b (Abemectin)

Azinphos-ethyl

Azinphos-methyl

Azoxystrobin

Benalaxyl

Bendiocarb

Benfluralin

Benoxacor

Bensulide

Bentazon

BHC alpha (HCH)

BHC beta (HCH)

BHC delta (HCH)

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Bifenazate
Bifenox
Bifenthrin
Binapacryl
Bitertanol
Boscalid (Nicobifen)
Bromacil
Bromophos (Bromophos-methyl)
Bromophos-ethyl
Bromopropylate
Bromoxynil
Bromuconazole
Bupirimate
Buprofezin
Butachlor
Butylate
Cadusafos
Captafol
Captan
Carbaryl
Carbendazim
Carbofuran
Carbofuran, 3-hydroxy
Carbophenothion
Carbophenothion-methyl
Carboxin
Carfentrazone-ethyl
Chlorantraniliprole
Chlordane, cis-
Chlordane, trans-
Chlordimeform
Chlorfenapyr
Chlorfenson (Ovex)
Chlorfenvinphos
Chlorimuron-ethyl
Chlornitrofen (CNP)
Chlorobenzilate
Chloroneb
Chlorothalonil
Chlorpropham (CIPC)
Chlorpyrifos (Chlorpyrifos ethyl)
Chlorpyrifos-methy
Chlorsulfuron
Chlorthion
Chlorthiophos
Cinerin
Clethodim
Clethodim Sulf
Clofentezine
Clomazone
Clopyralid
Clothianidin Coumaphos
Crotoxyphos
Cyanazine
Cyanofenphos
Cyanophos
Cyantraniliprole
Cyazofamid
Cycloate
Cyhalothrin, lambda
Cymoxanil
Cypermethrin: as the sum of Cypermethrins, alpha and zeta
Cyprodinil
Cyromazine
Dacthal (Chlorthal-dimethyl)
Daminozide
DDD, o,p'-
DDD, p,p'-
DDE, o,p'-
DDE, p,p'-
DDT, o,p'
DDT, p,p'-
DEF (Tribufos)
Demeton-S
Demeton-S methyl
Demeton-S methyl sulfone
Desmedipham
Diallate
Diazinon
Diazoxon
Dicamba
Dichlobenil
Dichlofenthion

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Dichlofluanid

Dichlorbenzamide

Dichlorvos

Diclobutrazol

Diclofop-methyl

Diclofop (acid)

Dicloran

Dicofol, o,p'/ p,p'-

Dicrotophos

Dieldrin

Diethofencarb

Diethyltoluamide

(DEET)

Difenoconazole

Diflubenzuron

Diflufenzopyr

Dimethenamid

Dimethoate

Dimethomorph

Dinotefuran

Diniconazole

Dinocap

Dinoseb

Dioxathion

Diphenamid

Diphenylamine

Disulfoton

Disulfoton sulfone

Disulfoton sulfoxide

Dithianon

Diuron

Edifenphos

Endosulfan alpha

Endosulfan beta

Endosulfan sulfate

Endrin

Endrin aldehyde

EPN

EPTC (Eptam)

Esfenvalerate/Fenvalerate

Etaconazole

Ethalfluralin

Ethiofencarb

Ethion

Ethirimol

Ethofumesate

Ethoprophos

Ethoxyquin

Etofenprox

Etoxazole

Etridiazole

Etrimfos

Famoxadone

Famphur

Fenamidone

Fenamiphos

Fenamiphos sulfone

Fenamiphos sulfoxide

Fenarimol

Fenbuconazole

Fenbutatin oxide

Fenchlorphos

Fenhexamid

Fenitrothion

Fenobucarb

Fenoxycarb

Fenpropathrin

Fenpyroximate

Fenson

Fensulfothion

Fenthion

Fenuron

Fipronil

Flonicamid

Fluazifop

Fluazinam

Fluchloralin

Flucythrinate

Fludioxonil

Flufenacet

Flumioxazin

Fluopicolide

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Fluopyram
Fluoxastrobin
Flupyradifurone
Fluridone
Fluroxypyr
Flusilazol
Fluthiacet Methyl
Flutolanil
Flutriafol
Fluvalinate
Fluxapyroxad
Folpet
Fomesafen
Fonofos
Foramsulfuron
Forchlorfenuron
Formetanate
Furathiocarb
Halosulfuron-methyl
Haloxyfop
Heptachlor
Heptenophos
Hexachlorobenzene
Hexaconazole
Hexazinone
Hexythiazox
Hydroprene
Imazalil
Imazamox
Imazapic
Imazapyr
Imazaquin
Imazethaphyr
Imidacloprid
Imidoxone
Indaziflam
Indoxacarb
Iprobenfos
Iprodione
Isazophos
Isobenzan
Isocarbophos
Isodrin
Isofenphos
Isofenphos-methyl
Isofenphos OA
Isoprocarb
Isopropalin
Isoprothiolane
Isoproturon
Isoxaben
Isoxaflutole
Jasmolin
Kresoxim-methyl
Lactofen
Lenacil
Lindane (gamma BHC)
Linuron
Malaoxon
Malathion
Mandipropamid
MCPA/MCPB
Mecarbam
Mecoprop (MCPP)
Mepanipyrim
Mesosulfuron methyl0.
Mesotrione
Metalaxyl / Mefenoxim
Metconazole
Methacrifos
Methamidophos
Methidathion
Methiocarb
Methiocarb sulfone
Methiocarb sulfoxide
Methomyl
Methoxychlor
Methoxyfenozide
Metobromuron
Metolachlor
Metolcarb
Metribuzin
Metsulfuron-methyl
Mevinphos
MGK 264

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MirexMolinate

Monocrotophos

Monolinuron

Myclobutanil

Naled

Napropamide

Neburon

Nicosulfuron

Nitrapyrin

Nitrofen

Norflurazon

Novaluron

Nuarimol

Omethoate

O-Phenylphenol

Oryzalin

Oxadiazon

Oxadixyl

Oxamyl

Oxamyl-oxime

Oxychlordane

Oxydemeton-Methyl

Oxyfluorfen

Oxythioquinox

Paclobutrazol

Paraoxon (Paraoxon-ethyl)

Paraoxon methyl

Parathion ethyl

Parathion methyl

Penconazole

Pendimethalin

Penflufen

Pentachloroaniline

Pentachlorobenzene (PCB)

Pentachlorophenol

Pentachlorothioanisole (PCTA)

Penthiopyrad

Permethrine

Perthane

Phenmedipham

Phenothrin

Phenthoate

Phorate

Phorate OA

Phorate Sulfone

Phorate Sulfoxide

Phosalone

Phosmet

Pyroxsulam

Quinalphos

Quinclorac

Quinoxyfen

Quintozene (PCNB)

Quizalofop

Resmethrin

Rimsulfuron

Rotenone

S421

Saflufenacil

Sebuthylazine

Sethoxydim

Simazine

Simetryn

Spinetoram

Spinosad (Spinosyn A, D)

Spirodiclofen

Spiromesifen

Spirotetramat

Spirotetramat enol

Spiroxamine

Sulfallate

Sulfentrazone

Sulfometuron-methyl

Sulfosulfuron

Sulfotep

Sulfoxaflor

Sulprofos

tau-Fluvalinate

Tebuconazole

Tebufenozide

Tebuthiuron

Tecnazene

Tefluthrin

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Tembotrione

Tebuconazole

Terbacil

Terbufos

Terbufos sulfone

Terbufos sulfoxide

Terbuthylazine

Terbutryn

Tetrachlorvinphos

Tetraconazole

Tetradifon

Tetramethrin

Tetrasul

Topramezone

Tralkoxydim

Triadimefon

Triadimenol

Triallate

Triasulfuron

Triazophos

Tribenuron-methyl

Triclopyr

Trichlorfon

Trifloxystrobin

Trifloxysulfuron

Triflumizole

Trifluralin

Triflusulfuron-methyl

Triforin

Triticonazole

Thiabendazole

Thiabendazole, 5-hydroxy

Thiacloprid

Thiamethoxam

Thifensulfuron-methyl

Thiobencarb

Thiodicarb

Thiometon

Thionazin

Thiophanate-methyl

Tolclofos-methyl

Tolfenpyrad

Tolylfluanid

Vinclozolin, Zoxamide

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Quick Start Guide: How to Get the Best Results with Protection Plus™

Protection Plus™ is not a typical insecticide. It's a natural, contact-based solution that doesn't rely on chemical residue or systemic absorption. To get the most out of it, application technique is key.

Preparing the Mixture

- Always shake the concentrate bottle before measuring—ingredients settle.
- Fill sprayer with water first, then add concentrate to avoid foaming.
- Agitate after mixing. Shake every 30 minutes during use.
- Use within 30 days of preparation for best efficacy.
- Use our online calculators for accurate dosing. High efficacy depends on proper dilution.

Application Best Practices

- Contact is required. Protection Plus must touch the insect to work.
- Fine mist is critical. A nozzle <40 microns for wide, even coverage is ideal
- Cold foggers and electrostatic sprayers provide perfect thorough coverage.
- Don't drench—cover. Aim for complete surface coverage with a thin mist, not a thick coating.
- Spray sequence improves success: stem → under canopy → top of canopy.
- Spray at night or 2+ hours after lights off to decrease plant stress.

Frequency and Timing

- Heavy infestations may require 2–3 sprays in a single day to reach all layers.
- Light infestations may need 1–2 sprays over a few days.
- Preventative use = 1 spray per week as part of IPM.

See It in Action

Watch our *Watch 'em Drop* playlist on YouTube for real insect kill-time videos. Subscribe to be notified when we upload new footage.

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Mixture: How to Properly Prepare

Proper preparation of the mixture is the most critical step in ensuring the documented efficacy of Protection Plus. Many growers fail to achieve the expected results due to improper preparation. These steps must be followed in the exact order outlined below to ensure success. Additionally, the dosage specified on the product label must be accurately measured and applied.

1. **Fill the Spray Equipment with Water First:**
   - Before adding the concentrate, fill the spray equipment or bottle with water. This prevents foaming caused by the soap in the ingredients. If foam forms, the appropriate dosage of concentrate cannot be measured accurately.

2. **Agitate the Concentrate:**
   - Shake or agitate the concentrate bottle thoroughly before measuring the required amount. Natural ingredients in the product will settle at the bottom, and failure to agitate will result in an ineffective mixture that is essentially water.

3. **Add Concentrate to Water:**
   - Measure and add the required volume of concentrate to the water-filled spray equipment. Use our online calculator for accurate dosing.

4. **Agitate the Prepared Mixture:**
   - After adding the concentrate, shake or agitate the spray equipment to ensure all ingredients are thoroughly mixed and suspended. Failure to do so will result in spraying water rather than the effective mixture.

5. **Maintain Suspension:**
   - The ingredients will remain suspended for approximately 30 minutes after agitation. Agitate the spray equipment every 30 minutes to keep the mixture effective.

Additional Notes:

- Use the prepared mixture within 30 days. Otherwise, dispose of the diluted mixture and prepare a fresh mixture.

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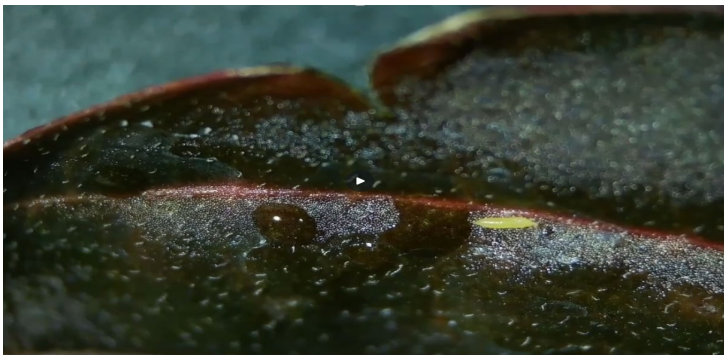
Spray Equipment: Best Practices

Protection Plus™ is a contact insecticide, not a systemic insecticide. It does not leave any residue, meaning it has no lasting residual effect. This makes proper application crucial—coverage is key to success. Since Protection Plus™ must make direct contact with the target pest, it is important to achieve thorough, widespread coverage rather than a thick coating.

When spraying a solution, it may appear that the entire surface is covered, but under a microscope, large gaps between spray droplets can be observed. If a pest is located between these droplets, it will not come into contact with the solution and will not be affected. The key to success is achieving a **fine mist spray** that ensures maximum coverage.



Think you're hitting your target? Think again!

In this video, we sprayed a thrip on a jade leaf twice – only to completely miss it BOTH TIMES.

Under a microscope, you can see how easy it is for tiny pests to escape contact when the spray nozzle isn't fine enough.

Missed Spray = Missed Kill.

🎥 Watch our short video showing how even direct sprays can miss tiny pests if the mist isn't fine enough. Click here to view the video.

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Best Practices for Spray Equipment:

- **Use a Fine Mist Nozzle:** The optimal nozzle size for effective application is **<40 microns**. A smaller droplet size ensures a broader and more even coverage.

- **Minimize Air Disturbance:** Many pests are sensitive to leaf movement. If your sprayer generates a lot of air or wind, it can cause leaves to move, allowing pests to fly away before the spray makes contact. To prevent this, use an **airless sprayer** when possible.

- **Optimize Dilution Rates with Efficient Coverage:** When efficient widespread coverage is achieved using a **cold fogger** or sometimes even an **electrostatic sprayer**, less concentrate product can be used. It is important to test to ensure thorough coverage, and **IF** adequate coverage is achieved, a **2-ounce per gallon dilution rate** may be sufficient instead of the standard **4-ounce per gallon dilution rate**.

Recommended Spray Equipment (built-in agitator for consistent mixture highly recommended):

- **Backpack Sprayer**
- **Cold Fogger**
- **Electrostatic Sprayer**
- **Handheld Sprayer**
- **Hose End Sprayer (fine mist if used for foliar spray)**
- Hydraulic Sprayers
- **Pump-Up Sprayer**
- **Powered Sprayer**
- **Portable Drum Sprayer**

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Application: Understanding the Frequency

Protection Plus™ (PRP) is a **non-systemic, contact-only insecticide**. That means it must make **direct physical contact** with the pest in order to work—it does not move through the plant, nor does it leave behind a chemical residue. This key characteristic influences how and when you should apply the product for both curative and preventative use.

Why Repeated Applications Are Sometimes Necessary

In heavy infestations, insects often cluster or "stack" on top of one another—especially in crevices, under leaves, or at the base of stems. When you spray Protection Plus™, the **top layer of pests will be killed**, but those underneath may be shielded from the solution and remain unaffected.

Once the top layer dies off, the second layer becomes exposed—but unless you apply Protection Plus™ again, these newly exposed insects may survive long enough to feed or lay eggs, continuing the cycle of infestation.

For this reason, we recommend multiple applications in a short period during **heavy infestations**, particularly on **Day 1**. This is not overkill—it's a strategic way to ensure that **every layer of pests gets direct contact** with the solution as the infestation breaks apart.

Understanding Weekly Prevention Sprays

Some growers have asked whether weekly preventative applications are needed to prevent insects from developing **resistance**. The answer is **no**.

Protection Plus™ contains no synthetic chemicals, no oils, and no residue that would promote resistance development. Weekly applications are recommended because **insects are always present**, even when not visible. By the time you see insects, they've likely already multiplied and spread.

Weekly preventative sprays are simply part of a smart **IPM (Integrated Pest Management)** strategy—killing pests early before they're visible and before they can colonize the crop.

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How to Use the Application Frequency Charts

Each insect section includes a quick-reference chart to help you determine the right application frequency for your situation:

- **Heavy Infestation (Stacked Bugs):** Use this protocol when pests are visibly clustered and actively feeding or flying. These situations require rapid, layered applications to ensure full contact.
- **Light Infestation or Early Catch:** Use this when you see a few pests or catch activity early. Fewer applications are typically needed.
- **Weekly IPM Prevention:** Follow this schedule when no pests are visible but you're maintaining a clean, healthy crop.

By tailoring your spray frequency to the severity of the infestation—and understanding *why* timing matters—you'll get the best performance from Protection Plus™ without overusing product or labor.

Aphids under a microscope stacked on top of each other (heavy infestation)

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Preventative Use: Why Weekly Sprays Work

Protection Plus™ is not systemic and does not leave a chemical residue—so how can it be used as a preventative?

Insects are small. Really small. And most of the time, you won't even know they're there until you see the damage—which means you're already behind.

That's why we recommend using Protection Plus™ as part of your **weekly preventative spray schedule.** Even if you don't see pests, applying weekly ensures you're targeting:

- Insects that are too small to detect
- Early-stage infestations before population booms
- Eggs that have not yet hatched

Protection Plus™ kills **all life stages**, including eggs, nymphs, and adults—as long as it makes contact. By spraying weekly, you're staying one step ahead of problems, avoiding crop damage, and keeping pest pressure low year-round.

Think of it like brushing your teeth—you don't wait for a cavity to form before you start.

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Application: Understanding Coverage vs. Coating

Protection Plus™ is a **non-systemic, contact-only** insecticide. That means it will only kill pests that **physically touch the spray**—and it will not leave behind any residue or continue working once dry. Because of this, **how** you apply the product is just as important as **when** you apply it.

Don't Confuse "Thorough" with "Heavy"

One of the most common mistakes we see is the assumption that plants need to be drenched in thick layers of spray for Protection Plus™ to work. In reality, this **wastes product** and **doesn't improve efficacy**.

What you're aiming for is **even, thorough coverage** across all plant surfaces:

- Soil surface
- Stems
- Undersides of leaves (where pests love to hide)
- Tops of leaves

A **thin layer** that touches every target area is far more effective than a heavy layer that only hits part of the plant.

Why a Fine Mist Matters

Under a microscope, spray droplets are surprisingly far apart. If a pest is standing between two large droplets, it may never make contact with the solution—and Protection Plus™ won't be able to work. That's why **spray quality and nozzle type** are key to success.

Using a **fine mist spray** (ideally <40 microns) improves the chances of every pest being contacted. Equipment like **cold foggers** and **electrostatic sprayers** are ideal because they:

- Deliver widespread, even coverage
- Wrap spray around stems and leaves
- Avoid dripping or pooling (less waste)
- Reduce labor by covering more in less time

These tools make it possible to use **less product** while still achieving exceptional results.

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Remember: Contact Is Everything

Because Protection Plus™ is not systemic and does not leave a residue, **every application must touch the pest** to be effective. Thorough coverage is what ensures that happens—not how much product ends up dripping off the plant.

Less is more—if it hits the target.

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Application: Outdoor Soil

Protection Plus™ can replace four individual products resulting in a lower cost to the farm/greenhouse. Protection Plus™, besides being an excellent leaf insect killer, can be applied to the water when watering. By continuously using Protection Plus™ at super low doses during watering, it will repel insects in the growing medium while at the same time greatly reducing or eliminating biofilm on the roots.

Biofilm is one of the biggest problems facing organic and non-organic growers. Biofilm, as it forms on roots, can restrict nutrients, water, and oxygen from entering the roots. The reduction of oxygen from the biofilm promotes the die-off of smaller roots which in turn attracts insects to the decaying matter. The continuous low-dose application of Protection Plus™ makes the growing medium less desirable for insect colonization while at the same time helping plants achieve true genetic potential. Note: While a well-developed root system is generally recognized as a good thing and biofilm can be generally recognized as a good thing in the soil, too much biofilm from the overfeeding of insoluble plant foods on the roots may cause the plant root system to be unhealthy.

Kill Pests Dosage: This will be an estimation since we don't know how much water you will use per plant per watering. **Water the plants and wait until they are fully hydrated**. Add 2-4 ounces (60-120ml) of Protection Plus™ to one gallon of water and mix. Apply to the soil's surface around the plant's root zone using a watering can or a pump-up sprayer. Penetrate the surface of the soil to a depth of ½ inch. Wait for 10 minutes and then water the plants. Apply every 3 days until the pests have moved away or have died.

By Hand or Truck: If possible, water the plants and wait until they are fully hydrated. Add 1-2 teaspoons (5- 10ml) of Protection Plus™ to one gallon of water and mix. Apply an ounce or two to the soil's surface around the plant's root zone using a watering can, pump-up sprayer, or truck water applicator/sprayer.

Irrigation system top watering or bottom watering systems: Dose the water supply by adding 0.1ml – 1.0ml per gallon of water, or 1.0ml – 10.0ml per 10 gallons of water, or 5.0mls – 50 ml per 50 gallons of water. This can and should be used when watering. Top watering or bottom watering systems.

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Application: Indoor Soil

Applying Protection Plus™ to Greenhouse soil with no way of mixing it in large quantities.

Protection Plus™ can replace four individual products resulting in a lower cost to the farm/greenhouse. Protection Plus™, besides being an excellent leaf insect killer, can be applied to the water when watering. By continuously using Protection Plus™ at super low doses during watering, it will repel insects in the growing medium while at the same time greatly reducing or eliminating biofilm on the roots.

Biofilm is one of the biggest problems facing organic and non-organic growers. Biofilm, as it forms on roots, can restrict nutrients, water, and oxygen from entering the roots. The reduction of oxygen from the biofilm promotes the die-off of smaller roots which in turn attracts insects to the decaying matter. The continuous low-dose application of Protection Plus™ makes the growing medium less desirable for insect colonization while at the same time helping plants achieve true genetic potential. Note: While a well-developed root system is generally recognized as a good thing and biofilm can be generally recognized as a good thing in the soil, too much biofilm from the overfeeding of insoluble plant foods on the roots will cause the plant root system to be unhealthy.

Kill Pests Dosage: This will be an estimation since we don't know how much water you will use per plant per watering. **Water the plants and wait until they are fully hydrated.** Add 2 ounces (60ml) of Protection Plus™ to one gallon of water and mix. Apply to the soil's surface around the plant's root zone using a watering can or a pump-up sprayer. Penetrate the surface of the soil **to a depth of ½ inch**. Wait for 10 minutes and then water the plants until runoff from the pot is seen. Apply every 3 days until the pests have moved away or have died.

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Application: Foliar Spray

Protection Plus can be used effectively as a foliar spray to target insects hiding on plant stems, under the canopy, and on the top of leaves. To achieve the best results and avoid providing hiding spots for pests, follow this specific sequence during application:

1. **Spray the Stems First:** Start by thoroughly spraying the stems of the plant. This ensures any insects hiding on the stems are contacted by the spray.

2. **Spray Under the Canopy:** Next, spray underneath the canopy. This prevents leaves from sagging due to the weight of the solution, which could create an "umbrella" effect that allows insects to hide underneath the canopy and avoid contact.

3. **Spray the Top of the Canopy Last:** Finally, spray the top of the canopy to ensure all leaf surfaces are covered evenly.

Outdoor Leaf Applications

If possible, make applications of Protection Plus™ after irrigation. If irrigation is above the canopy, allow the leaves to dry before application. Make all applications early in the day, late in the day, or on cloudy days. Applications may be done with handheld, pump-up, or powered sprayers.

Dosage: For the proper dosage, please refer to the type of pest to be treated within this manual for dosage and applications suitable for fields and farms.

Indoor Leaf Applications

If possible, water the plants until they are fully hydrated. Once hydrated, make all applications early in the day, late in the day, or on cloudy days. Applications may be done with handheld or pump-up sprayers.

Dosage: For the proper dosage, please refer to the type of pest to be treated within this manual for dosage and applications suitable for fields and farms.

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Application: Buds and Blooms

Protection Plus™ is very kind to plants. However, no liquid, including water should be sprayed on a bud or bloom unless it is necessary. Cosmetically speaking, just the minerals alone in water can change delicate hairs to a different color.

If it is necessary to apply Protection Plus™ because of a pest infestation that could destroy the crop, it would be better to spray the buds than not to spray.

Use the least amount needed to get the job done. Slight imperfections to bud hairs may be apparent.

Review our "Blossom Chronicles" YouTube playlist to see the effects on blooms/buds.

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Application: Soil Drench

If possible, isolate one plant and test it before treating the entire crop. This will help determine plant sensitivity, health, and whether the dose should be maintained, increased, or reduced. Multiple applications on the same day using a higher dose may be done if plants are strong enough and hydrated sufficiently to endure it. Very weak plants may require daily applications using a lower dose, once a day, until they can tolerate more intensive treatments.

Protection Plus contains citric acid, a powerful natural ingredient that can burn plants if not applied correctly. It is crucial to hydrate plants thoroughly before applying the prepared solution and to flush the system with fresh water 25 minutes after application to prevent potential damage. Proper preparation and application ensure both the efficacy of the treatment and plant safety.

Directions:

1. **Pre-Treatment Hydration:**
    - Irrigate the soil with water only, ensuring the pH matches the growers' method.
    - Achieve 30% runoff to flush the root zone and hydrate the plant thoroughly.
    - Wait 1 hour before applying the drench solution.
2. **Drench Application:**
    - Prepare the drench solution by diluting 2 ounces of Protection Plus per gallon of water.
    - Use a water wand to completely saturate all growing media, focusing on deep penetration into the root zone.
    - Ensure 30% runoff to confirm complete coverage.
    - Allow the solution to remain in the growing media for 20-25 minutes.
3. **Post-Treatment Flush:**
    - After 20-25 minutes, flush the growing media thoroughly **with a nutrient solution** to remove excess Protection Plus mixture.
    - Continue flushing until a 40% runoff is achieved.

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Additional Considerations:

- Perform treatments at night or 2 hours after lights off when transpiration levels are low, minimizing plant stress.
- Do not allow the treatment solution to remain in the growing media for more than 1 hour.
- Use diluted solutions within 30 minutes of preparation and re-agitate the mixture if settling occurs.

Safety Note:

Citric acid is a highly effective pest control ingredient but can be phytotoxic if not used properly. Following these directions carefully will safeguard plant health while eliminating pests effectively.

For Optimal Results:

- Apply with water and air temperature at 82°F
- **Soil drench**: apply during dark period

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Use in Fertilizer Tea Brewing Process

While using teas made from organic materials is a great way to feed plants, it can bring on some undesirable situations. Tea is a prime source of food for pests, so applying it is like ringing a dinner bell. Adding Protection Plus™ to the water before adding the other ingredients makes for a superior tea. Protection Plus™ should be used when making tea from liquids, solids, or both. After the tea has been applied to the soil it will help to repel insects and powdery mildew, reduce the odor of the tea as it breaks down, and increase the soil's bioactivity. *It should be noted that the strength of the tea will likely increase with the use of the Protection Plus™ as it will greatly increase bioactivity.* It will also help to reduce the amount of slime/biofilm that can accumulate in and around the root zone. Biofilm is undesirable because when it coats the roots it reduces water, mineral uptake, and discourages mycorrhiza from attaching to the roots. It is amazing how well the plants will respond to the proper conditions found in the soil.

Dosage:

Concentrated tea: Use 1 teaspoon (5mls) per gallon of water and ingredients. Add ingredients to water, add Protection Plus™ and let brew. Allow the tea to brew for at least 24 hours, longer is always better as it takes a while for the bacteria in your tea to break down the solids that are holding onto the NPK, minerals, amino acids, and more.

Ready to use tea: (you make it up and apply it directly to the plant) use 1 teaspoon (5mls) per 5 gallons of water and ingredients. Allow the tea to brew for at least one hour.

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Application before Entry into Facility

Re-enter facility after Protection Plus™ application has dried. What is the number one way insects get into your garden? You invite them in. Plants should be treated with Protection Plus™ before they are brought into any indoor or outdoor setting. Even if you don't see any pests, we still suggest you spray the plants and quarantine them until you do not detect any pests for 10 days. Spray your newly acquired plants with Protection Plus™ once a day for three days and then once every three days while they are in quarantine. Soil: Under high-intensity light, empty the soil onto a white surface and watch carefully for Mite or Aphid movement. Rockwool: Remove the wrapper and inspect the areas between the plastic and Rockwool. Remove a slice of the Rockwool and inspect under a microscope.

Safety

All state and federal agencies are recommending that you cover up with protective clothing and proper equipment such as gloves, eyewear, and mask when you spray pesticides. As with any product, discontinue using the product if a rash occurs as you may be allergic to one or more of its ingredients. When used as directed, Protection Plus™ is fairly gentle to the skin but should be rinsed off after contact.

Mixing and Application Period

Natural ingredients will settle to the bottom after 30 minutes and will require you to re-agitate. Replace prepared mixture after 30 days. Clean sprayer before and after use.

Using a wetting agent

Environmental Plant Management **does not** recommend a wetting agent. Protection Plus™ has a proper surfactant package, even for dirty field-grown leaves.

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Lighting and Applications

This issue is debatable. We have seen no harm spraying when the lights were ON, as long as HID lighting is not too close to the plants. Fluorescent and LED lighting can be fairly close to the plants without phytotoxic (ill) effects. Spray one part of a plant and watch for possible indications of problems before spraying the entire crop. With any pesticide, make sure the plants are hydrated before application. In most cases, the plants will show signs of relief after being sprayed with Protection Plus™.

Odor Control

When sprayed, Protection Plus™ gives off a pleasant fermentation smell. Once dried Protection Plus™ will not emit an offensive odor. No fragrances have been added.

Pets

We have seen no ill effects on pets while applying or after the application of Protection Plus™ to areas where plants are growing. Remove pets from the area during application. Pets may return after application has dried.

Plant Growth

Protection Plus™ *will **not** significantly slow plant growth*. Why? It doesn't use oil and detergents as its primary ingredients. Oil-based pesticides will slow plant growth. Why? Since oil and water don't mix well, the oil needs to have a heavy-duty detergent or soap added to it so that it will be soluble in water. When the combination of oil and detergent/soap is sprayed on the leaves and allowed to dry, the dried pesticide clogs the stomata and blocks light to the chloroplasts. Note: In most cases, the plants will show signs of relief after being sprayed with Protection Plus™.

Rinsing Protection Plus™ off Plants

You can rinse foliage off after you have determined the infestation is under control. Protection Plus does not leave a residue, so rinsing is not necessary.

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Plant Soil Flush

Protection Plus™ can be used to flush out excess minerals. Always remember to flush it out after ten minutes with water. **Application:** Add Protection Plus™ to water and mix. Then, flood containers with plenty of runoff. Flush with water after 5 minutes. This will greatly reduce the mineral deposits in the soil. Be sure to water and hydrate plants before flushing with Protection Plus™.

Dosage: Mix 1tsp/5ml per 5 gallons of water.

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About This Section (Insect Control)

Protection Plus™ is effective against a wide range of insect pests—not just the few listed in the following pages. While this section focuses on the most common insects our growers ask about, the truth is: **if it has a skin, we can probably kill it.**

Our mode of action doesn't depend on chemical toxicity or systemic absorption. Protection Plus™ is a **contact-based, non-systemic** solution. That means we don't kill *on* contact—we kill *because of* contact. The product must physically touch the insect in order to begin working.

Once contact is made, Protection Plus™ begins digesting the insect's exoskeleton—causing structural collapse and suffocation. **The thinner the skin, the quicker the kill. The thicker the skin, the longer it takes.** Kill times vary widely, from just a few seconds to up to 24 hours, depending on factors like:

- Insect maturity
- Exoskeleton thickness
- Exposure time
- Coverage quality
- Moisture levels on the plant surface

We continuously test and document these kill times on real insects, using live footage. You can find this growing collection on our YouTube playlist Watch 'em Drop, where we show actual applications and real-time insect responses to Protection Plus™.

👉 Subscribe to our channel to be notified each time we upload a new video. If you're wondering, "Will Protection Plus kill ??????"—chances are, we've already shown it. If we haven't yet, we probably will soon.

Just a Few of the Insects We've Documented:

- Caterpillars
- Earwigs
- Grasshoppers
- Grubs
- Hollyhock Weevils
- Mealybug
- Planthoppers
- Slugs
- Stinkbugs

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Ants

Ants are related to Wasps and Bees having six jointed legs. The Ant's prey is primarily food source is insects and sap from plants, but some will hunt vertebrates. In any case, these little creatures will find their way into crops grown outdoors and indoor dwellings that have cracks and crevices leading to the outdoors. They do this to wait for prey to arrive and drink from morning dew or watering systems. Their presence on coffee, cannabis, and other bushy shrubs and trees that need to be harvested creates a real problem. While few people die from the sting, the sting is almost always very painful, and many workers will simply not perform tasks amongst infested crops. The problem facing growers in the past was pesticides that were effective in killing or repelling the Spiders were not suitable to be used on food crops.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. When flushing, check the EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then allow time for the plant to hydrate and then treat for insects. Outdoor field growers should water the plants before application, either in the morning or late in the day when atmospheric conditions allow for the longest contact time to the pest before evaporating.

Protection Plus™ is very effective in the killing and repelling of Ants. Ants will under often die within 20-30 seconds after application. Some may take longer but death will come. Fire and Carpenter ants are tough but Protection Plus™ will keep them off of the harvest.

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1. If you have an extreme infestation and need to gain quick control of your crop, you now know you are prone to extreme pest attacks from incoming plants, guests, workers, or a source unknown. If you have pest issues you have plant quality and harvest quantity issues. In the end, the company that supplies the market with the most consistent produce wins. Just like buying fertilizer, weekly pest treatments are part of the cost of doing business.

2. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the insects may be crawling.

3. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants.*

4. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

5. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. Ants are hard to control.

6. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Maintain this strength as russet mites are hard to control. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

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For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when Transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

Application Timing for Treating Ants:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Frequency" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Ants:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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Aphids: Leaf

The leaf Aphid life cycle starts on the leaf and ends on the leaf however some may use the soil to access the plant stem. Eggs can be seen with a microscope but often are misidentified as trichomes. Generally speaking, an Aphid egg is larger than the trichome and oblong in shape and may be seen with a white, light green, or brownish pigmentation. Aphids, in general, will have a teardrop shape with two antennae-like protrusions at the rear of the insect. This shape is common for both leaf and root Aphids with root aphids tending to be much more colorful.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

1. We recommend you spray the surface of the soil to penetrate ¼" down to where the insects may be crawling.

2. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

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3. **Dosage:** should stay at 4 ounces (120 ml) per gallon of water. These insects are hard to control.

4. Since they fly, leaf aphids will go airborne when they feel the spray hitting the leaves of nearby plants. If the plants are in a vegetative state, then you might want to spray over the plants so when they do go airborne, you will hit them with the spray. IF your plants are in bloom, you will have to determine the severity of the infestation. If the thrips are placing the blooming crop in danger of failure, then you will have to kill them. As we have addressed before, by just spraying water on delicate buds you will notice some cosmetic imperfections. Most plants in the early stages of bloom growth will out-grow any cosmetic imperfections.

5. *The Aphid will die within seconds of the application and freeze in place looking like statues. This condition may fool you into thinking they are still alive but with closer examination, they are indeed dead. They will eventually fall off of the leaf or simply brush them or wash them off.*

6. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Maintain this strength as leaf aphids are hard to control. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

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For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

Application Timing for Treating Leaf Aphids:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Frequency" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Leaf Aphids:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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Aphids: Root

The root Aphid life cycle starts in the soil and goes to above-ground vegetation. Some may fly, some don't. Eggs can be seen with a microscope but often are misidentified. Generally speaking, an Aphid egg is larger than a leaf trichome and oblong in shape and may be seen with a white, light green, or brownish pigmentation. Aphids, in general, will have a tear drop shape with two antennae-like protrusions at the rear of the insect. This shape is common for both leaf and root Aphids with root aphids tending to be much more colorful.

The Root Aphid will take longer to die than the standard Leaf Aphid. While most young aphids will die within seconds of the application and freeze in place looking like statues, the older adults may take longer to die.

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

We recommend you treat all of the soil/growing media making sure to penetrate down into the root ball where the root Aphids are concentrated. It is the root ball that protects the root Aphids from rain and other natural hazards so naturally, it is the root ball that is hardest to treat with the Protection Plus™. It is important to take the time to slowly pour your prepared mixture of Protection Plus™ around the base of the stem, allowing the treatment to fully soak into the areas *inside* the root ball until runoff from the pot occurs. Then treat the rest of the soil/growing media.

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Protocol for Treating Root Aphids:

Step 1: Initial Irrigation

1. Irrigate the soil/growing media with water only, ensuring the pH aligns with the grower's method.
2. Achieve 30% runoff to thoroughly flush the root zone
3. Wait 1 hour before proceeding to the next step.

Step 2: Drench Application

1. Prepare a drench solution of Protection Plus at a concentrate of 2 ounces per gallon of water.
2. Use a water wand to completely saturate all growing media, ensuring coverage deep into the root ball.
3. Achieve 30% runoff to confirm adequate saturation.
4. Allow the solution to sit in the media for 20-25 minutes.

Step 3: Soil Spray Application

1. During the 20-25 minute wait, use a pump sprayer to apply Protection Plus at a concentration of 3 ounces per gallon of water.
2. Spray the top layer of soil to penetrate ½ inch to 1 inch deep, focusing on areas near the base of the plant.

Step 4: Nutrient Drench

1. After the 20-25 minute wait, drench the soil with the nutrient solution per your feeding schedule.
2. Achieve 40% runoff to ensure thorough distribution and prevent residue buildup.

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Step 5: Foliage Spray Application

1. Immediately after the water/nutrient flush (Step 4), use a sprayer to apply Protection Plus at a concentration of 4 ounces per gallon of water.

2. Spray the undersides and topsides of leaves, ensuring complete coverage.

Additional Notes:

1. **Timing:** Perform the treatment at night, at least 2 hours after sundown or lights off, when plant transpiration levels are lowest.

2. **Protection Plus Exposure:** Do not allow Protection Plus to remain in the soil for more than 1 hour.

3. **Sanitation:** After the nutrient flush (Step 4), spray benches and floors with Protection Plus at a concentration of 4 ounces per gallon of water to eliminate root aphid crawlers.

Preparation Instructions:

1. **Agitation:** Shake the concentrate bottle well before diluting.

2. **Dilution:** Prepare the solution as per the specified concentrations (2 ounces per gallon for drenching; 3 ounces per gallon for soil spray; 4 ounces per gallon for sanitation).

3. **Usage Window:** Use the diluted mixture within 1 hour. Re-agitate if necessary due to settling.

4. **Storage:** Store Protection Plus between 32°F and 120°F. Avoid freezing or excessive heat.

Safety Reminder: Protection Plus is a contact killer. Ensure all areas of the plant, soil, and surrounding surfaces are treated for effective eradication of root aphids and their crawlers.

Dosage for Treating Root Aphids:

Dilute 2 oz per gallon water for **soil drench**. Immediately follow up with an increase the dosage of 3 oz per gallon water for **topical soil spray**.

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Gnats

The Gnat life cycle starts in the soil as this is where they lay their eggs. The egg takes 4-6 days to hatch into a larva, then 12-14 days to turn into a pupa, then within 4-6 days, the adult gnat emerges. It will take 8-10 days for the adult to start laying eggs. Generally speaking, a Gnats egg is oblong in shape and may be seen with white or brownish pigmentation. Gnat larva and pupa, in general, will have a worm-like shape with a black spot that eventually turns into the eyes and or mouth.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

1. If you have an extreme infestation and need to gain quick control of your crop, you now know you are prone to extreme pest attacks from incoming plants, guests, workers, or a source unknown. If you have pest issues you have plant quality and harvest quantity issues. In the end, the company that supplies the market with the most consistent produce wins. Just like buying fertilizer, weekly pest treatments are part of the cost of doing business.

2. We recommend you spray the surface of the soil to penetrate ½ inch down to where the insects may be crawling.

3. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants in the greenhouse.*

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4. Multiple applications on the same day may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

5. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. These insects are hard to control.

6. Since they fly, they will go airborne when they feel the spray hitting the leaves of nearby plants. If the plants are in a vegetation state, then you might want to spray over the plants so when they do go airborne, you will hit them with the spray. If your plants are in bloom, you will have to determine the severity of the infestation.

7. In some instances, the gnats will be found deeper into the soil. One of the reasons may be that the soil has pulled away from the sides of the pot, allowing the gnat access to the lower areas of the soil. Also, some planters have holes in their sidewalls to help allow air to pass into the soil and achieve atmospheric root pruning. These air holes allow the gnat access to infest the entire area where the pot meets the soil. In this case, a root drench is advisable. Please see the section Application: Soil Drench.

8. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

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Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

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Application Timing for Treating Gnats:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Gnats:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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Mealybug

Mealybugs are soft-bodied, sap-sucking insects that attack a wide variety of plants. They are covered in a cotton-like, waxy coating that protects them from environmental conditions and some pesticides, making them particularly difficult to control. Mealybugs feed by piercing plant tissues and extracting sap, which weakens the plant, causes leaf yellowing, and leads to stunted growth. As they feed, they excrete honeydew, a sticky substance that promotes the growth of sooty mold and attracts other pests like ants.

Life Cycle of Mealybugs

Mealybugs undergo incomplete metamorphosis with three primary stages: egg, nymph, and adult.

1. **Egg Stage**
    - Female mealybugs lay their eggs in white, cottony sacs located in crevices on plant stems, leaf nodes, or under bark.
    - A single female can lay between **100 and 600 eggs** over a period of one to two weeks.
    - Eggs hatch in **6–14 days**, depending on temperature and humidity.
2. **Nymph (Crawlers) Stage**

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- Newly hatched mealybugs, known as *crawlers*, are mobile and actively search for feeding sites.
- The crawler stage is the most vulnerable to pest control treatments.
- Nymphs develop through **three instars**, progressively growing in size and producing their characteristic waxy coating.

3. **Adult Stage**
   - Adult female mealybugs remain wingless and continue feeding on plant sap.
   - Male mealybugs develop wings but do not feed; their only function is to mate before dying shortly afterward.
   - Females live for **up to two months**, continuously laying eggs and sustaining infestations.

Mealybug Behavior & Challenges in Pest Management

- **Rapid Reproduction:** A single female can produce hundreds of offspring, leading to exponential population growth.
- **Waxy Coating:** This protective layer makes it harder for traditional pesticides to penetrate and effectively kill the insect.
- **Hidden Infestations:** Mealybugs tend to cluster in leaf axils, under leaves, along stems, and even in root zones, making detection difficult.
- **Honeydew Production:** Their sugary excretions attract ants, which protect mealybugs from natural predators, exacerbating infestations.
- **Resurgence Risks:** Even after adult mealybugs are eliminated, eggs and nymphs may persist, requiring **multiple treatment applications**.

Insect Control Application

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

1. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the

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insects may be crawling.

2. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants.*

3. Multiple applications on the same day may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

4. **Dosage** should stay at 4 ounces (120 ml) per gallon of water.

5. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water **THEN** add to your spray equipment. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench

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Application Timing for Treating Mealybug:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Mealybug:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact

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with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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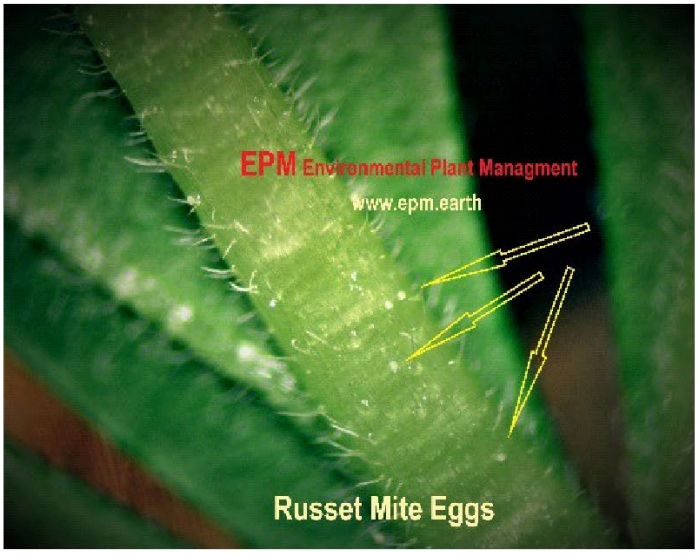
Mites: Russet



The Russet Mite life cycle starts on the leaf and ends on the leaf however some may use the soil to access the plant stem. Eggs can be seen with a microscope but often are misidentified as trichomes. Generally speaking, the Russet Mite egg is slightly smaller than the trichome with a more rounded appearance. Eggs will turn from clear to opaque to orange after treatment signifying their transition from healthy to dead.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

1. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the insects may be crawling.

2. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants.*

3. Multiple applications on the same day may be done *if the plants are strong enough and*

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hydrated enough to endure it. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

4. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. Russet Mites are hard to control.

5. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench

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Application Timing for Treating Russet Mites:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Russet Mites:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned

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insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE

- ✅ **Use a fine mist nozzle (<40 microns)**
- 💧 **Thin coverage = more effective than thick coating**
- 🕐 **Timing depends on infestation level**
- 🚫 **Must make contact—no residue or systemic action**
- 🌙 **Spray at night or 2 hours after lights-off preferred**

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Mites: Spider

The Spider Mite life cycle starts on the leaf and ends on the leaf however some may use the soil to access the plant stem. When temperatures exceed 75 degrees F, **Spider mites can go from hatch to adult in 3-4 days.** It is extremely important to get control of the crop as soon as possible. Eggs can be seen with a microscope but often are misidentified as trichomes. Generally speaking, the Spider Mite egg is slightly larger than the trichome with a more rounded appearance with some species showing a black dot or dots. Eggs will turn from clear to opaque to orange after treatment signifying their transition from healthy to death.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

1. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the insects may be crawling.

2. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants in the greenhouse.*

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3. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

4. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. These insects are hard to control.

5. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

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Application Timing for Treating Spider Mites:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Spider Mites:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned

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insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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Powdery Mildew

There are many varieties of mold and mildew. We will address them all here as Powdery Mildew. Protection Plus™ works great to suppress Powdery Mildew. Once you have Powdery Mildew, it will be very hard to get rid of it unless you spray weekly to keep it from getting out of control. **Before applying any fungicide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*** Professional Fungicide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects.

1. **Effectiveness -** For fungicides to be effective, they must be applied as soon as symptoms are noticed, but the best method of control is prevention. Once mildew growth is extensive, controlling the situation with any fungicide becomes more difficult. It is highly recommended to use Protection Plus™ as a protectant to highly susceptible plants before the disease appears.

2. **Coverage -** Protection Plus™ is effective only on contact, so applications must thoroughly cover all susceptible plant parts. As plants grow and produce new tissue, additional applications may be necessary at 7- to 10-day intervals as long as conditions favor disease growth.

3. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. Powdery Mildew is hard to control.

4. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss

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hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops

5. Much research needs to be done to determine whether powdery mildew as a whole or a certain strain affects certain plants systemically. There are thousands of strains of powdery mildew, some specific to plants as rose powdery mildew is different than powdery mildew found on cucumbers. In the case of Cannabis, at the time of this writing, it is up in the air which one or more powdery mildew strains affect Cannabis. Until more is known, the best way to keep powdery mildew from corrupting the crop is to consistently use a proper IPM program. It is known, however, that powdery mildew is much more common in plants that are underfed and overfed, with overfed being more problematic.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

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Application Timing for Treating Powdery Mildew:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no PM is seen
Light Infestation	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no PM is seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Powdery Mildew:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Scale

Scale insects are small, sap-feeding pests that often go unnoticed until significant plant damage has occurred. They attach themselves to stems, branches, and the undersides of leaves, sucking plant sap and weakening the host over time. What makes scale particularly troublesome is their protective outer covering—either a soft or hard shell-like waxy armor—that shields them from many treatments and environmental conditions.

Life Cycle of Scale Insects

Scale insects follow a **gradual metamorphosis** that includes the following stages: egg, crawler (nymph), and adult.

1. **Egg Stage**
    - Female scales lay eggs beneath their bodies or under a protective covering called a test or scale shell.
    - Depending on the species, eggs may be laid individually or in clusters and hatch in **5 to 10 days** under warm conditions.
2. **Crawler Stage (Nymph)**
    - Upon hatching, the *crawlers* are mobile and actively search for a place to feed. This is the **most vulnerable stage** for control efforts, as they lack the protective waxy coating.
    - Crawlers may settle and begin feeding within hours. Once settled, they start producing their waxy shell and become immobile.

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3. **Adult Stage**
    - Most adult female scales remain stationary for the rest of their life. They feed continuously and reproduce without moving.
    - Male scales (in certain species) go through a pupal stage and emerge as winged adults with no mouthparts—they do not feed and live only long enough to mate.
    - Adult females can live **up to several weeks**, laying hundreds of eggs during their lifespan.

Behavior & Pest Management Challenges

- **Two Types of Scale:**
    - *Soft Scale* produces honeydew and has a pliable protective cover.
    - *Armored Scale* has a hard shell and does not produce honeydew, making it harder to detect and treat.
- **Protective Coverings:** Once the waxy shell forms, scale insects are highly resistant to most contact treatments. This makes the crawler stage the most strategic time to intervene.
- **Host Specificity:** Some scale species are highly selective, while others attack a wide variety of plants, including ornamental, greenhouse, and crop varieties.
- **Secondary Issues:** Infestations often lead to yellowing leaves, branch dieback, reduced vigor, and mold growth due to honeydew excretions in soft scale species.
- **Repopulation Risk:** Eggs laid under the adult body or scale covering can hatch in waves, requiring **multiple applications** to break the lifecycle.

Treatment Protocol for Scale Insects

Before applying any pesticide, ensure plants are **fully hydrated**. Flush thoroughly with water and achieve runoff. Wait **1 hour** after watering before applying Protection Plus™.

Crawler Stage (Soft Scale / Pre-Armor)

This is the **most effective window** for control. Crawlers lack the waxy coating and are vulnerable to contact sprays.

1. **Application Sequence**
    - Spray in this order: **stems**, **under the canopy**, **top of canopy**, then **soil (top ½")**.
    - Ensure full coverage—every square inch of the plant must be treated.
2. **Dosage**

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- **4 oz per gallon of water**.
- Use an airless sprayer for best coverage without disturbing plants.

3. **Result**
   - One application is typically sufficient to eliminate crawlers.
   - Continue monitoring weekly for signs of new hatchlings.

Armored Scale Stage (Adult)

Once scale insects have formed a hardened protective shell, they become significantly harder to kill. These insects often excrete **sticky honeydew**, forming a glue-like seal between their shell and the plant surface.

Step 1: First Application

- Purpose: Break down the **honeydew seal** and loosen the armored shell.
- **4 oz per gallon** of water.
- Apply in standard spray sequence: stems → under canopy → top of canopy → soil (top ½").
- Allow to dry. After drying, some scales may be **wiped away manually** using a damp cloth or soft brush.

Step 2: Second Application (Optional)

- Purpose: Penetrate under the loosened shell and attack the insect directly.
- Reapply **within 24-48 hours** of the first application.
- Dosage: **4 oz per gallon**.
- Focus spray on remaining scales. Protection Plus will **dehydrate the interior membrane**, causing the armor to **crack** and leading to the insect's death.

Step 3: Third Application (As Needed)

- If residual armored shells persist, a **third application** may be applied within 24 hours..
- The goal is to ensure **complete dehydration** of the outer armor and eliminate any surviving adults.

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Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

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Application Timing for Treating Scale (crawler stage):

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Scale:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

For Optimal Results:

- **Spray when transpiration is low:** Early morning, 2 hours after lights off, or late in the day.
- **Avoid direct sunlight** when spraying outdoors.
- **Re-agitate diluted mixture every 30 minutes.** Use within 30 days of mixing.
- **Soil drench**: see section – Application: Soil Drench.
- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).

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Scorpions

Scorpions are related to Spiders in that they are arachnids having eight jointed legs. The Scorpion's prey is primarily other insects, but some will hunt vertebrates. Many species will run towards an adversary no matter how large it is. In any case, these little creatures will find their way into crops grown outdoors and indoor dwellings that have cracks and crevices leading to the outdoors. They do this to wait for prey to arrive and drink from morning dew or watering systems. Their presence on coffee, cannabis, and other bushy shrubs and trees that need to be harvested creates a real problem. While few people die from the sting, the sting is almost always very painful, and many workers will simply not perform tasks amongst infested crops. The problem facing growers in the past was pesticides that were effective in killing or repelling the scorpions were not suitable to be used on food crops. **Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*** Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. When flushing, check the EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then allow time for the plant to hydrate and then treat for insects. Outdoor field growers should water the plants before application, either in the morning or late in the day when atmospheric conditions allow for the longest contact time to the pest before evaporating.

1. If you have an extreme infestation and need to gain quick control of your crop, you now know you are prone to extreme pest attacks from incoming plants, guests, workers, or a source unknown. If you have pest issues you have plant quality and harvest quantity issues. In the end, the company that supplies the market with the most consistent product wins. Just like buying fertilizer, weekly pest treatments are part of the cost of doing business.

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2. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the insects may be crawling.

3. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants in the greenhouse.*

4. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

5. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. These insects are hard to control.

6. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

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For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

Application Timing for Treating Scorpions:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Scorpions:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE

- ✅ **Use a fine mist nozzle (<40 microns)**
- 💧 **Thin coverage = more effective than thick coating**
- 🕓 **Timing depends on infestation level**
- 🚫 **Must make contact—no residue or systemic action**
- 🌙 **Spray at night or 2 hours after lights-off preferred**

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Spiders

Spiders are related to Scorpions in that they are arachnids having eight jointed legs. The Spider's prey is primarily other insects, but some will hunt vertebrates. In any case, these little creatures will find their way into crops grown outdoors and indoor dwellings that have cracks and crevices leading to the outdoors. They do this to wait for prey to arrive and drink from morning dew or watering systems. Their presence on coffee, cannabis, and other bushy shrubs and trees that need to be harvested creates a real problem. While few people die from the sting, the sting is almost always very painful, and many workers will simply not perform tasks amongst infested crops. The problem facing growers in the past was pesticides that were effective in killing or repelling the Spiders were not suitable to be used on food crops.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. When flushing, check the EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then allow time for the plant to hydrate and then treat for insects. Outdoor field growers should water the plants before application, either in the morning or late in the day when atmospheric conditions allow for the longest contact time to the pest before evaporating.

Protection Plus™ is very effective in the killing and repelling of Spiders. Spiders will under often die within 20-30 seconds after application. Some may take longer but death will come.

1. If you have extreme infestation and need to gain quick control of your crop, you now know you are prone to extreme pest attacks from incoming plants, guests, workers, or a source

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unknown. If you have pest issues you have plant quality and harvest quantity issues. In the end, the company that supplies the market with the most consistent produce wins. Just like buying fertilizer, weekly pest treatments are part of the cost of doing business.

2. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the insects may be crawling.

3. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants in the greenhouse.*

4. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

5. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. Spiders are hard to control.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

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For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

Application Timing for Treating Spiders:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Spiders:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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Thrips

Thrips are very hard to kill for a few reasons that we should go over. Thrips crawl and fly, and when they start to fly, you will find them on objects all over the room. Their life cycle starts in the soil so you will need to treat the soil to kill the eggs, larvae, and adults living there.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and show a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

1. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the insects may be crawling.

2. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants in the greenhouse.*

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3. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

4. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. These insects are hard to control.

5. Since the thrips fly, they will go airborne when they feel the spray hitting the leaves of nearby plants. If the plants are in a vegetation state, then you might want to spray over the plants so that when they do go airborne, you will hit them with the spray. If your plants are in bloom, you will have to determine the severity of the infestation. If the thrips are placing the blooming crop in danger of failure, then you will have to kill them. As we have addressed before, by just spraying water on delicate buds you will notice some cosmetic imperfections. Most plants in the early stages of bloom growth will out-grow any cosmetic imperfections.

6. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for the mist applications. Make sure the sprayer is rated for food crops.

7. **The best time of day to spray for thrips is early in the morning or late in the evening when the insects are less active, temperatures are cooler, and plant transpiration rates are lower. Cooler temperatures and lower light levels mean thrips are less likely to fly away when leaves move.**

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

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For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench

Application Timing for Treating Thrips:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Thrips:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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Whiteflies



There are six stages of growth on the leaf, one of the stages is flight. The eggs are oblong and whitish in color and the nymphs are translucent and may take on the color of the plant leaf as light bounces back through it. Flying insects are always a challenge however, Protection Plus™ is a great knockdown pesticide. Spraying over the canopy will promote flight and this is a good time to make sure enough pesticide travels into the air to make contact will all of the fliers. Because the fliers may get only a partial application, we are suggesting the maximum dosage.

Before applying any pesticide, make sure the plants are fully hydrated. *Flush the plants well with water and showing a good amount of run-off. Wait 1 hour before application.*

Professional Pesticide Applicators Note: Many infestations come from stress caused by excess fertilizer in the growing medium. Check EC/PPM of the last few ounces of run-off from the pot. It must be the same EC/PPM as the water you used to flush with. Repeat the flush procedure until you get matching numbers, then treat for insects. Always test one plant with multiple applications to understand the severity of plant stress and unhealthiness before treating the whole crop.

1. If you have an extreme infestation and need to gain quick control of your crop, you now know you are prone to extreme pest attacks from incoming plants, guests, workers, or a source unknown. If you have pest issues you have plant quality and harvest quantity issues. In the end, the company that supplies the market with the most consistent produce wins. Just like buying fertilizer, weekly pest treatments are part of the cost of doing business.

2. We recommend you spray the surface of the soil to penetrate ¼ inch down to where the insects may be crawling.

3. Spray the leaves and stems for crawlers, breeders, and eggs making sure that every square inch of the plant has been treated. *Treat all plants in the greenhouse.*

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4. Multiple applications on the same day using the strong strength may be done *if the plants are strong enough and hydrated enough to endure it*. Very weak plants may need applications daily until they are strong enough to endure multiple applications on the same day.

5. **Dosage** should stay at 4 ounces (120 ml) per gallon of water. These insects are hard to control.

6. Since they fly, they will go airborne when they feel the spray hitting the leaves of nearby plants. If the plants are in a vegetation state, then you might want to spray over the plants so when they do go airborne, you will hit them with the spray. If your plants are in bloom, you will have to determine the severity of the infestation. If the thrips are placing the blooming crop in danger of failure, then you will have to kill them. As we have addressed before, by just spraying water on delicate buds you will notice some cosmetic imperfections. Most plants in the early stages of bloom growth will out-grow any cosmetic imperfections.

7. *The Whitefly will die within seconds. They will eventually fall off of the leaf or simply brush them or wash them off.*

8. If possible, use an airless sprayer. They emit a very consistent fine spray without a lot of pressure behind it. This will allow the plant's leaves to not move around so much that you miss hitting the pests. 100 ft super light-weight hoses and extra reach attachments are available. Use the orifice supplied for fine mist applications. Make sure the sprayer is rated for food crops.

Directions:

1. Root Zone water flush (until runoff) is recommended before application. **Wait 1 hour** after the flush to apply the diluted mixture.
2. Fill the Spray Equipment with water first.
3. **AGITATE** bottle of concentrate **BEFORE** diluting.
4. Dilute 4 oz per gallon with water. Reference our online dosing calculator.
5. **AGITATE DILUTED MIXTURE**. Natural ingredients will settle to the bottom after 30 minutes and will require you to **re-agitate**. Do not store diluted mixture over 30 days.
6. Protection Plus™ is a contact killer. Spray in this sequence: stems, under canopy, top of canopy, soil (only top ½"). Fully coat stem and canopy.
7. Do not store below 32°F or above 120°F.

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For Optimal Results:

- Apply with water and air temperature at 82°F (indoors) or between 50°F and 90°F (outdoors).
- **Foliar spray**: spray when transpiration levels are at their lowest (beginning of the day or 2 hours after lights off or late afternoon (not direct sunlight). Spray in this sequence: stems, under canopy, top of canopy.
- **Soil drench**: see section – Application: Soil Drench.

Application Timing for Treating Whiteflies:

Use this chart as a guide based on what you see. For heavy infestations, repeated contact is needed to reach all insect layers. See "Application: Understanding the Timing" for a full explanation.

Infestation Level	Day 1	Days 2-4	Day 7	Ongoing IPM Prevention
Heavy Infestation (Stacked Bugs)	Up to 3 applications (morning, mid-day, night)	1 application per day	1 application	Resume weekly sprays if no insects are seen
Light Infestation or Early Catch	1-2 applications (ideally 12 hrs apart)	*Optional*: 1 application every other day	1 application	Resume weekly sprays if no insects are seen
Weekly IPM Prevention	-	-	-	1 application per week (ongoing)

Note: Weekly prevention is not about pesticide resistance. It's part of a proactive IPM strategy.

Dosage for Treating Whiteflies:

Dilute 4oz Protection Plus™ per gallon of water when used as a foliar spray.

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Understanding Insect Life Cycles and the Need for Multiple Applications:

Protection Plus is a non-systemic, contact killer. This means that Protection Plus requires direct contact with insects to achieve its documented efficacy – it does not necessarily kill instantly on contact. When applied, Protection Plus begins digesting the exoskeletal wall of the insect, causing it to collapse and leading to suffocation. At times, growers may observe insects crawling or flying away after contact with Protection Plus. Even in these instances, the product is actively working. The thicker-skinned insects that escape often succumb to infection caused by Indigenous bacteria, which infect the wounds created as Protection Plus continues digesting their exoskeletons. The insect picks up these bacteria as it moves within the treated plant environment.

It is important to note that if an insect does not die immediately and lays eggs before its death, these eggs will hatch and may require additional treatment. Protection Plus is effective against all insect life cycles, including eggs, but as a non-systemic product, it does not affect eggs laid after the adult insect has been sprayed. Multiple applications may be necessary to address the eggs that hatch after the adult insect's death, ensuring complete eradication of the infestation.

QUICK REFERENCE	HEAVY INFESTATION (STACKED APHIDS)
• ✅ Use a fine mist nozzle (<40 microns) • 💧 Thin coverage = more effective than thick coating • 🕓 Frequency depends on infestation level • 🚫 Must make contact—no residue or systemic action • 🌙 Spray at night or 2 hours after lights-off preferred	

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Predatory Insects Use in Integrated Pest Management

Protection Plus™ is a great choice to use as a knockout treatment for infestations before releasing predatory mites, aphids, etc. as predatory insects are much better at controlling insect infestations than irradicating them. You want to kill the pests and their young before releasing the predatory insects. Once Protection Plus™ has dried it will not harm the predatory insects.

Predatory insects are great for protecting gardens if predatory insect numbers are high in number, however, the cost of introducing enough predatory insects to stop an infestation before the plants are beyond help usually ends up being quite expensive. Treat the plants with Protection Plus™ and release the predatory insects after 95-100% of the pests are dead. Russet Mites and Spider Mites can populate extremely fast when temperatures are above 75 Degrees F. It is the opinion of many that you will need to kill *at least* 95% of the pests before the release of the predatory insects or the pests will have a good chance of repopulating before the predatory insects can take control of the infestation. Should the pests repopulate faster than the predatory insects can control them, all of your labor and money spent will be lost and the process will have to start again.

This method of treating the plants first with Protection Plus™ will ensure the best results coming from the predatory insect release and cost you less money in the long run by giving you a better chance of a successful predatory insect population.

Always apply Protection Plus™ and wait for it to dry before releasing predatory insects. It's also a good idea to make sure most of the adult pests, their larvae, and eggs are dead before releasing predatory insects.

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NOTES:

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