

Pioneer Nuggets Integrated Pest Management

IPM is an acronym that gets thrown around a lot these days, often with little understanding of what a well-rounded integrated pest management program is. Any thoughtful IPM program starts with a clean, proactive approach in the forms of cultural and mechanical pest & pathogen management. Keeping sealed growing environments, scrubbing not only the greenhouses that our plants spend their lives but the facility that surrounds them. Making sure our team washes their hands and arms, changes their clothes and use of foot baths with work specific shoes if necessary. These are the first steps in a full IPM program, after which comes your plans for biological and product control. Below is a list of every product we've ever used at Pioneer. While most don't touch a majority of our crops, we at Pioneer Nuggets believe in transparency and education, letting our customers know what we use, what makes them tick and why we trust the product is an important value to all of the Pioneer family.

1) Oxidate 2.0

The first in a long line of OMRI listed products! This product contains a couple of diluted oxidizers, such as the hydrogen peroxide you can buy at the store for your boo-boos. This product is applied as a foliar spray and can be applied all the way through flower.

2) Grandevo

Another OMRI listed product! This is another biological pesticide derived from a strain of *Chromobacterium subtsugae*, a naturally occurring bacterium found in the soil of a mountainous region of the east coast. The mode of action includes preventing feeding and stopping reproduction. This can be used as both a soil drench (i.e. we irrigate into our pots like we would our fertilizer) and a foliar spray through week 5 of flower.

3) Suffoil-X

Yet another OMRI listed product! The main mode of action here is suffocation of eggs, larvae, nymph stage insects, mites and other soft bodied insects upon contact. Only used as a foliar spray in the vegetative stage.

4) Cease

Another OMRI Listed product. The main active ingredient is a strain of *Bacillus subtilis* a bacterium with a wide range of uses, including controlling a broad spectrum of fungal or bacterial issues should they arise. Used primarily as a foliar spray and can be applied until week 6 of flower.

5) Kaligreen

Another OMRI listed product. The main active ingredient is potassium bicarbonate. It's a way to control any fungal issues that may occur in the vegetative or early flower stages. It works by disrupting a key biological function in the cell walls of fungus to break it down.

6) Azaguard

Another OMRI certified product with the main active ingredient Azadirachtin. This is the same primary component used in many organic gardening approaches to pest management. This product is also used only in Nurse/Veg as a drench and isn't applied as a foliar spray onto flowers.

7) Botanigard Maxx

Botanigard is a product we utilize as a soil drench. It's a mixture of an entomopathogenic fungus (*Beauveria bassiana*) and a naturally occurring insecticidal compound from Chrysanthemum flowers. The fungus is one that specifically attacks certain insects by taking root inside them, feeding off the pest's own nutrients and body, before leaving them a mummified husk. This product we only use as a soil drench in the vegetative state and the first week of flower.

8) Clonex Rooting Gel

While technically listed as a pesticide, the function for this product is different. The product comes as a gel that we dip our cuttings (otherwise known as clones) into. It mimics a naturally occurring plant hormone that helps in creating callus tissue at the bottom of the cutting, which helps enable new roots to form on our new plant babies.

Link to EPA pdf on the active ingredient ->
https://www3.epa.gov/pesticides/chem_search/reg_actions/registration/fs_PC-046701_1-Aug-00.pdf

We employ **beneficial insects** as a broad-spectrum preventative measure against a wide variety of pests. Agricultural pests are a matter of fact and beneficial insects are a sustainable and natural solution that we fully endorse. They are effective in regulating outbreaks and prove just as effective at controlling pest populations as bottled pesticides but without all the harsh chemicals.

9) Beneficial Nematodes

Entomopathogenic nematodes are extraordinarily lethal to many invasive insect pests yet safe for plants and animals. This high degree of safety means that nematode application does not require any safety equipment or have Reentry restrictions. Nematodes are fast working and can kill insects within 24–48 hours. Dozens of different insect pests are susceptible to infection.

10) Dalotia Coraria (Roving Beetle)

Dalotia is a native species of soil-dwelling rove beetle, which feeds on small insects and mites. Both adults and larvae are active, aggressive predators.

11) Stratiolaelaps Scimitus 'Wormersley'

Stratiolaelaps is a native species of soil dwelling mite, which feeds on small insects and mites (e.g., springtails, root mealybug crawlers, spider mites). Adults are tan in color, less than 1/20 inch (1 mm) long. They move rapidly over the soil surface.

12) Amblyseius (Neoseiulus) Fallacis

Fallacis is a native predatory mite that feeds on spider mites, rust mites and small insects. It is one of the most important biological control agents in North American berry and orchard crops.

13) Amblyseius (Neoseiulus) Cucumeris

A. Cucumeris is a species of predatory mite that feeds on immature stages of thrips. It also feeds on pollen, two-spotted mites and other species of mites. Cucumeris adults are pear-shaped, tan colored mites, less than 1/50-inch (0.5 mm) long. Eggs are round, transparent and 0.01-inch (0.14 mm) in diameter.