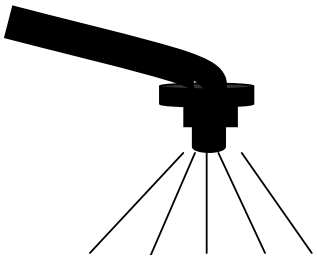

Bug-Wise

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Insecticides for Commercial Vegetable Production: Commercial vegetable growers have access to a large number of effective insecticide products, but these insecticides are costly and, in many cases, are target specific. That is they provide excellent control of some pests but not others. This makes it important to be sure to choose an insecticide that is effective against the particular pest, or group of pests, that needs to be controlled.

Keeping up with new insecticides and knowing which products to use for which pests, as well as knowing when to apply these products, is an ongoing challenge that must be met each year to produce a high quality, marketable crop. One way to keep track of insecticides and their uses is to divide them into groups based on the class of chemistry, method of application, or type of insect pests they control. The following lists are intended to provide examples of these kinds of groups, but they are not intended to be complete or definitive. See product labels and other insect control recommendations for information on use rates, labeled crops, PHIs, and other critical information. Always read product labels at least twice—once just before you buy the product and again just before you apply the product.

Caterpillar Products:

SpinTor 2 SC (spinosad), by Dow, is effective against a wide range of caterpillar pests. It is also one of the better foliar treatments for thrips and provides good control of Colorado Potato beetle. However, it is not effective against most other beetle pests or bug pests, such as stink bugs and leaffooted bugs. It is labeled for use on a wide range of vegetable crops, including herbs. It has a 1 day PHI on cole crops and fruiting vegetables, but some crops have longer PHIs.

Radiant 1 SC (spinetoram), by Dow, is a new, 'Spintor-like' product that will likely replace Spintor in future. It controls the same array of pests as Spintor but is generally more effective.

Coragen 1.67 SC (chlorantriniliprole or rynaxypyr), by Dupont, is also a new caterpillar insecticide. It is currently labeled on brassica, leafy non-brassica, cucurbits, and fruiting vegetables. Though this product is labeled for foliar application, it also has a label for application through drip irrigation as a systemic treatment to control caterpillar pests on certain crops, including fruiting vegetables.

Avaunt 30 WDG (indoxacarb), by Dupont, is specifically labeled for caterpillar pests. It is similar to Spintor in that it provides good control of most caterpillar pests, but it does not control thrips. Avaunt is labeled on tomatoes, peppers, okra, brassica, leafy vegetables, cucurbits, and a few other groups. It has a 3 day PHI on tomatoes, peppers, and okra.

Intrepid 2F (methoxyfenozide), by Dow, is an insect growth regulator that is only effective against caterpillar pests. It is especially useful against loopers and armyworms. It is labeled on cole crops, leafy vegetables, turnips, and fruiting vegetables with a one day PHI, and is also labeled on a few other crops.

Pyrethroids – Pyrethroids are quite effective against certain caterpillar pests, such as tomato fruitworms, cutworms, melonworms, pickleworms, squash vine borer, and hornworms, but they do not control loopers, armyworms, or diamondback moths. Other products will provide better control against these caterpillars. See the following discussion on pyrethroids.

Pyrethroids:

Pyrethroids are broadspectrum insecticides that control a wide range of insect pests, but there are some pests they don't control. There are many different brand names, representing different active ingredients, but all are chemically similar and control the same array of pests. Pyrethroids are especially useful against stink bugs, other 'bug,' pests, and most beetles. However, infestations of spider mites, whiteflies, aphids, and certain species of loopers and armyworms may actually be increased by pyrethroid sprays.

Examples of pyrethroid insecticides include: Asana (esfenvalerate), Baythroid (cyfluthrin), Brigade (bifenthrin—used to be known as Capture), Mustang Max (zetamethrin), Warrior (lambda-cyhalothrin), Proaxis (gama-cyhalothrin), and Pounce (permethrin). Note that the chemical names of most pyrethroids end in 'thrin'.

One of the most important factors to consider in choosing a pyrethroid is the PHI (pre-harvest interval) for the crop being treated and whether or not the pyrethroid is even labeled for that crop. For example Proaxis has a 5 day PHI on tomatoes and may not be used on melons, while Brigade has a 1 day PHI on tomatoes and a 3 day PHI on melons. Brigade is one of the few insecticides labeled for use on okra, with a 7 day PHI.

Soil-Applied neonicotinoids:

Three neonicotinoid products are labeled for application to the soil for systemic control of insects such as aphids, whiteflies, thrips (foliage-feeding species), and flea beetles or cucumber beetles. These are usually applied at planting, or shortly after planting, or through drip irrigation. Such treatments usually have very long PHIs, but because they are applied so early (at or near planting), this does not usually interfere with harvest. These three active ingredients are also labeled as foliar sprays on certain vegetable crops—sometimes under a different brand name. It is important to avoid overusing products in this group in order to delay development of insecticide resistance. Avoid making foliar applications of neonicotinoids to crops that have received a soil treatment of a neonicotinoid and follow other resistance management recommendations on the label.

Admire Pro 4.6 lb/gal (imidacloprid), by Bayer, is effective against aphids, foliage-feeding thrips, whiteflies, and cucumber beetles. It is labeled for use on fruiting vegetables, head and stem brassica, cucurbits, legumes, leafy vegetables, root vegetables, and some other groups. Admire Pro may be used on turnips, including turnips grown for greens, with a 21 day PHI. Provado 1.6 F is a different formulation of imidacloprid that is labeled for use as a foliar spray on certain vegetables.

Platinum 2SC (thiamethoxam), by Syngenta, is effective against aphids, thrips, whiteflies, and flea beetles. It is labeled on brassica, cucurbits, fruiting vegetables, leafy non-brassica, and some other groups. Actara 25 WDG is a different formulation of thiamethoxam labeled for use as a foliar spray on certain vegetables.

Venom 20 SG (dinotefuran), by Valent, is effective against aphids, thrips and whiteflies. It is labeled on head and stem brassica, cucurbits, fruiting vegetables, leafy vegetables non-brassica, and potatoes. Venom may be applied either as a foliar spray or as a soil-applied treatment, but note that the rates differ considerably depending on method of application. Venom is one of the more effective treatments for silverleaf whiteflies.

Whiteflies, especially silverleaf whitefly:

Whiteflies are mentioned individually because they are such difficult pests to control when they do occur, especially silverleaf whiteflies (*Bemesia spp*.). Fortunately, there are several effective treatments for silverleaf whitefly and growers can do a good job controlling this pest, provided they start early and make effective use of the different treatments that are available. It is important to avoid repeated treatment with any single class of chemistry to delay resistance. Soil applied treatments of Venom or Platinum are very effective for early control of whiteflies. Also, the miticide Oberon (spiromesifen) is effective against whiteflies. The two insect growth regulator products discussed below also are very useful for control of silverleaf whiteflies, and these growth regulator products definitely need to be used in situations where silverleaf whiteflies are expected to be a serious problem.

Knack 0.86 lb/gal, (pyriproxyfen), by Valent, is a growth regulator that is very effective against immature whiteflies, including silverleaf whiteflies. However, it is slow-acting and must be used before populations get out of hand. It is labeled on brassica, cucurbits, and fruiting vegetables.

Courier 40SC (buprofezin), by Nichino, is another slow-acting growth regulator that is very effective against immature whiteflies when used against building populations. It is currently only labeled on cucurbits, snap beans, and tomatoes.

Assail 30 SG (acetamiprid) by UPI, is a neonicotinoid product that is only labeled for use as a foliar spray (there is no soil-applied formulation). However, it is one of the more effective foliar treatments for whiteflies. It is labeled for use on cole crops, leafy vegetables, cucurbits, fruiting vegetables, and a few other groups. Avoid applying Assail to crops that have received a soil-applied neonicotinoid (Admire Pro, Platinum, or Venom).

Beetles:

Pyrethroids are useful foliar treatments against most beetle pests (see discussion above). Also Sevin 4F (carbaryl) is still one of the more effective treatments against beetle pests such as cucumber beetles, cowpea curculio, bean leaf beetles, and flea beetles, but the PHI is quite long on certain crops. Some of the soil-applied neonicotinoid treatments (see above discussion) are useful for early control of flea beetles or cucumber beetles on crops that are highly susceptible to injury by these pests. However, soil-applied treatments alone may not be enough to prevent heavy damage by cucumber beetles to young melons, and additional foliar sprays may be needed, especially on melons grown from transplants.

Bugs:

Bugs, like stink bugs, leaffooted bugs, squash bugs, harlequin bugs chinch bugs, etc, are best controlled with pyrethroids (see previous discussion on pyrethroids). Pyrethroids are especially effective against green and southern green stink bugs, but they are less effective against brown stink bugs. Thionex (endosulfan) is an effective, non-pyrethroid alternative for stink bug control in crops on which it is labeled.

Spider Mites:

Most insecticides do not control spider mites and many insecticides {eg. pyrethroids, Sevin (carbaryl) and Admire (imidacloprid)} tend to flare spider mite populations. It takes a specific miticide to control spider mites. Fortunately, there are currently several effective miticides labeled for use in commercial vegetables. Because spider mites will quickly develop resistance when repeatedly treated with the same product, it is especially important to rotate miticide use. Avoid making successive treatments with the same miticide. Observe the resistance management guidelines listed on the product label. Note that most miticides are only labeled for a few crop groups. Be sure to read the label carefully before treating and verify that the product you plan to use is labeled for the crop you plan to treat.

Agri-Mek 0.15 EC (abamectin), by Syngenta, is primarily a miticide, but it also controls leaf miners. It is labeled on cucurbits, fruiting vegetables, and leafy vegetables with a 7 day PHI. It is also labeled for control of mites on herbs. Agri-mek exhibits translaminar movement, which means it will move through leaves from top side to bottom side. This is a useful trait for miticides, because most spider mites live and feed on the undersides of leaves.

Acramite 50 WS or 4 SC (bifenzate), by Crompton is a specific miticide that is sold in two formulations, which have different uses. Acramite 50 WS is labeled on cucurbits, fruiting vegetables, and okra, with a 3 day PHI. Acramite 4 SC is labeled on legume vegetables and succulent peas with a 3 day PHI.

Oberon 2 EC (spiromesifen), by Bayer, is a relatively new product that is very effective on spider mites and also controls tomato russet mite. It is also quite effective against whiteflies, including silverleaf whitefly, and is useful in resistance management rotation plans for both whiteflies and spider mites. Obviously, Oberon is a good choice when mites and whiteflies are both pests of concern on labeled crops. Oberon is labeled for cucurbits, fruiting vegetables, leafy greens and leafy brassica, with a 7 day PHI. Oberon also exhibits translaminar movement.

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