Vegetable Notes
May 11,2000
Volume 11, Number 1

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Welcome!

Welcome to the year 2000 Vegetable IPM newsletter! It may be a new millenium, but what's happening in the vegetable fields is pretty much the same as ever -- predictably unpredictable. This newsletter will reach you weekly from now until September, and will provide updates on crops, crop conditions, insects, weeds, diseases, soils, new products, and new ideas for management. Using IPM means understanding how to grow a healthy crop, how to recognize and scout for pests, what their life cycle is, and when they reach damaging levels. IPM means using the whole range of options for managing pests. This newsletter will provide that information in capsule form -- based on what we observe on farms throughout the state. In addition, watch for news of current projects of the UMass Vegetable team, and notice of this season's twilight meeting series on vegetable and berry farms!

To subscribe to this newsletter via mail, call Marilyn Kuzmeskus at 413-577- 0712. To join our email distribution list, email your request to rhazzard@umext.umass.edu. Or, check the UMass Vegetable Program website at (http://www.umass.edu/umext/programs/agro/vegsmfr/).

Crop Conditions

So far it has been a season of extremes. After a warmer-than usual early spring, growth came to a halt with a period of cold, wet weather in late April. Planting schedules were delayed by wet and cold conditions. Greenhouse management was tricky with long periods of cloudy weather. Germination of early corn plantings has been spotty after seed sat in cold soil for several weeks. One grower commented to me early last week, "The corn is about a week behind but by July I probably won't be able to tell the difference." Sure enough, what followed were 4 days of 80-90-degree weather that pushed everything along in a hurry. Corn under plastic had to be cut open in a hurry. Coastal areas remained cool, however. Now we're back to heavy rains, soggy soils and 40-60 degrees. Despite the cold spells, we are ahead of normal in degree day accumulations.

'TIS the season for beetles

What do flea beetles, Colorado potato beetle, striped cucumber beetle, and asparagus beetles have in common? They are all members of one family of beetles -- Chrysomelids, the "leaf-feeding beetles". Somewhere back in evolutionary history this branch of beetles

developed into many different species with different host crops, but they still have a lot in common. They all feed on leaves in the adult stage, and all have an annoying habit of showing up suddenly on their favorite crop. Each type of beetle tends to feed on only one crop family, and is extremely skilled at finding it, however small the plant might be! Leaf beetles tend to spend the winter in the adult stage, mostly in field edges in the soil or in leaf litter. They become active in spring as weather warms up and fly from overwintering sites in search of food. Thus, crop rotation can make a difference in how many beetles arrive in a crop at this time of the year. Eggs are laid either on the leaves, or in the soil near the plant. Larvae feed on leaves or roots. Leaf feeding beetles have one or multiple generations per year, depending on the climate -- the farther north, the fewer generations there are. Whatever ecological niche these beetles held before humans came along, they now have adapted very well to our annual row-crop agriculture. We provide them with concentrated patches of ideal food. They provide us with a lot of headaches!

Asparagus Beetles

The beginning of the cutting season coincides all too well with the arrival of asparagus beetles, especially the common asparagus beetle. The spotted asparagus beetle tends to become active somewhat later in the spring. These two beetles are closely related and have similar life cycles but it is the common asparagus beetle that is most damaging to the cut spears. Their sudden appearance in the field can be mystifying -- where do they come from? How do they get here so fast? What can be done to reduce their numbers? Here's some background that may help answer these questions:

Identification: Common asparagus beetle (Crioceris asparigi) is blue-black, shiny, smooth and about 6 to 9 mm (1/4 inch) long, with three large yellow, squarish spots with red margins along each wing cover. Eggs are black, laid standing on end in rows along the spears. Larvae are wrinkled, plump, hump-backed, and dull gray with black head and legs. They grow up to 1/3 inch. Spotted asparagus beetle (Crioceris duodecimpunctata) is reddish orange or tan, with six black spots on each wing cover (hence its other name, 12-spotted asparagus beetle). Eggs are greenish, glued singly on their sides to leaves. Eggs are laid on fronds, not on spears. Larvae are similar to those described above, but are orange colored, and feed primarily on berries. Both species of beetles feed only on asparagus.

Winter habitat: Both species spend the winter as adult beetles. Sheltered sites such as under bark or in the stems of old plants are preferred. Some burrow into the soil. Thus they spend the winter in field borders, or within the asparagus planting itself.

Life cycle: Beetles feed as soon as the y become active, and begin laying eggs after several days of feeding. Eggs hatch in 3 to 8 days depending on temperature. Larvae feed for 10 to 14 days, molt four times, then crawl into the soil to form chambers in which they spin cocoons and pupate. After 5 to 10 days, new adults emerge. There are probably two generations in this part of New England.

Scouting: At this time in the season, look for adult beetles, for feeding damage and for eggs laid on spears. Michigan State recommends a treatment threshold of 5-10% of the

plants infested or 1-2% of the spears with eggs or damage.

Cultural and biological controls. If one is looking for preventative or cultural controls, this is where all the reference books get a little thin! Since asparagus is a minor crop in the grand scheme of things, research on this pest has been limited. Overwintering populations may be reduced if last year's fronds and stalks are disked lightly or burned in the fall. Maintaining a clean environment in the fall will force beetles to seek shelter outside the field or burrow in the soil, where many predators reside.

There are several beneficial insects that attack the asparagus beetle, including a tiny parasitic wasp (Tetrastichus asparagi) that attacks the egg stage. It kills eggs by feeding on them and by laying its own eggs, which hatch and grow inside the beetle eggs. If we could use less toxic insecticides to allow this parasite and other predators to survive, we would probably see the effectiveness of these natural enemies grow. Providing a nearby nectar source such as umbelliferous flowers for the wasps may increase their chances of suvival, but until we can keep economic damage down with less toxic insecticides this may be futile. However, using well-timed applications based on scouting could make a difference in the survival of natural enemies.

Chemcial control. Scout fields regularly and apply an insecticide as soon as beetles become active or reach damaging levels (see 2000-2001 New England Vegetable Management Guide for recommended materials). When harvesting, pick the field clean to reduce the number of stems where eggs will survive long enough to hatch and grow up into summer-generation beetles. All insecticides listed in the Guide have a one day to harvest interval. Apply immediately after picking to allow harvest the following day.

Some growers have asked about applying insecticides directly to the soil before the crop comes up and beetles are active. I do not see this as a worthwhile investment, since beetles are not present on the treated surface and all registered insecticides are short-lived materials.

Growing and Marketing Cilantro in Massachusetts

Cilantro (Coriandrum sativum) is an annual herb that closely resembles parsley and is in the same family of plants (Apiaceae). This pungent herb is native of southern Europe and is commonly known as Coriander, Cilantro, or Chinese Parsley. For many growers that sell retail, cilantro is second to parsley among herb sales. It is very popular among several different ethnic groups, including Latinos and many Asian groups. Cilantro is very easy to grow in Massachusetts!

Seeds are planted 1/4 to 1/2 inch deep in rows 12 inches apart. It is recommended to seed thickly (20 - 30 'seeds'/foot). The denser plant population competes more effectively with weeds in the row. In addition, the thicker planting makes harvesting easier since plants are bunched in the field. The "seed" of cilantro is actually the whole fruit with two embryos inside. This means that if you plant 10 "seeds" and get 100% germination you will have 20 cilantro plants. Have the soil tested and use the same fertility management used for leafy vegetables such as lettuce or spinach. Based on work implemented in

Massachusetts last season, cilantro will go to seed (bolt) quicker if fertility is lacking.

Cilantro can be started in the greenhouse and transplanted into the field. This is done most often in the spring in order to get an earlier harvest; however, if the plants become stressed they will bolt quicker than if they were direct seeded. Cilantro grows best under cool conditions while hot weather encourages it to flower. Cilantro will withstand temperatures as low as 10 degrees, which makes it an excellent spring and fall crop. Plantings of cilantro are usually made every 7 to 10 days to ensure a steady supply.

Growers in Massachusetts have not reported any serious insect pests of cilantro. Bacterial leaf spot (Pseudomonas syringae) is the most important disease of cilantro. Symptoms consist of angular, vein-delimited leaf lesions that are at first water-soaked or translucent. Over time and with drying conditions, the leaf spots may turn black or brown. If infection is severe, leaf spots may coalesce and cause a blighting effect. Under experimental conditions the pathogen will also infect parsley.

Cilantro is ready to be harvested as soon as the plant is 4 - 6 inches tall, which can take 40 to 60 days after planting. It can take up to 120 days to produce mature seed (coriander). The plant can regrow for a second cutting; however, it does not regrow as efficiently as parsley. For that reason many growers just harvest it once. Cilantro can also be harvested by pulling out the whole plant. Some ethnic groups (e.g. Latinos and some Asians) prefer to buy the plant with the roots intact. The roots are used in making soups or as condiments.

Cilantro has a fairly high respiration rate, similar to that of other green leafy vegetables. Therefore, in order to maintain optimum post harvest quality, cilantro should be harvested at the coolest times of the day (either early morning or in the evening), and stored under low-temperature, high humidity conditions. A high surface to volume ratio makes cilantro very susceptible to water loss. Placing cilantro roots or stems in water, or keeping the whole plant in plastic bags, will delay wilting.

Frank Mangan

Crucifers: flies and Beetles

Watch for cabbage root maggot flies, which have been active in the Connecticut River Valley since the first week of May. Flies are black, delicate and about ¼ inch long. Females lay eggs at the base of stems of crucifer plants, and the white leg-less maggots feed on the roots, causing the plant to wilt and die. To check your field for eggs, look for the tiny 1/8-inch long, rice grain-shaped white eggs that are laid along the stem, or on the soil next to the stem of young transplants. Often eggs are laid in neat rows, or inserted into the soil. They may be under a small clod of dirt near the stem. A pencil point helps stir the soil to look for them. The number of eggs per stem can range from 1 to more than 20. Check in several areas throughout the field. If you find more than an average of 1 egg/stem, it is likely to be a damaging population and a banded soil drench is recommended (see New England Vegetable Management Guide for materials). Use at least 200 gal/acre to soak the insecticide into the soil, and direct insecticide at the base of

plants in a narrow band over the row.

For non-chemical control, cover transplants or direct-seeded crucifers with floating spun-bonded row cover. The cover acts as a barrier, preventing flies from reaching plants to lay eggs. It must be laid down immediately after seeding or transplanting, sealed with soil along the edges, and should be used only in a rotated field so flies do not emerge under the cover.

Conditions have been both favorable and unfavorable for fly survival. Cool wet soils encourage egg-laying and egg survival. However, scorching sun and hot temperatures as we have had in recent days heats the top inch of soil to well over 90 oF, which is high enough to dessicate and kill the eggs. However, once larvae hatch they will move downward into cooler moister soils.

Crucifer flea beetles responded quickly to the warm spell, and have been feeding actively in young crucifers. Crop rotation seems to make a difference, as we see varying numbers in different fields. Cole crops in the Northeast are attacked by several species of flea beetles, but the most common is Phyllotreta cruciferae, the crucifer flea beetle. This beetle is solid black. It is important to note that flea beetles tend to be specific to crop families, and that different species attack corn, solanaceous crops (tomato, eggplant and potato), and crucifers. These beetles all look and act very similar in the field, but they will not attack other host crop families. Only the corn flea beetle is a significant disease vector (for Stewart's wilt).

Newly emerged crucifer seedlings and young transplants are very attractive to flea beetles. Their shot-hole feeding damage can set seedlings back or even kill them if it is severe enough. If damage is light, seedlings usually outgrow the damage. Row covers offer excellent protection -- lay down and seal immediately after seeding or transplanting.

There is no set threshold for chemical control. Judge the severity of damage and health of the plants. Beetles move in and out of crops on a daily basis from field borders so multiple applications may be necessary. In addition to insecticides listed in the 2000-2001 New England Vegetable Management Guide, imidacloprid is now registered for use on crucifers against flea beetles. It can be used in the soil-applied form (Admire) or as a foliar spray (Provado). One application may be sufficient. Calculate rates carefully -- using row feet often is better than using acreage -- and avoid higher than recommended rates, as phytotoxicity may result. There is a 21 days to harvest interval.

Vegetable IPM Message, Ruth Hazzard, Editor. The Vegetable IPM Message is published weekly from May to September and includes contributions from the UMass Extension Vegetable Program faculty and staff, growers, and private IPM consultants. Authors of articles are noted; author is R. Hazzard if none is cited.

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