1. Benlate Phaseout

Phase-Out of Benlate (benomyl) (From: Joe Kovach)

EPA has been informed by Dupont that it will announce today (Apr 18) a business decision to discontinue the manufacture of the widely used fungicide benomyl throughout the global market by the end of this year. The company has informed us that it expects to phase out distribution and sales of all benomyl products by the end of 2002. EPA stands ready to assist Dupont in carrying out the
company's request for voluntary cancellation and phase-out of benomyl, often marketed under the trade name Benlate here in the U.S. Benomyl is approved for use on about 70 fruit, nut, vegetable, and field crops. No residential uses are approved. EPA has been in the process of reviewing the human health and ecological effects of benomyl in order to complete a reregistration eligibility decision (RED) on the pesticide next year. On April 18, 2001, Dupont formally requested voluntary cancellation of all of their benomyl technical, end use, and special local need product registrations. The next step under FIFRA will be for EPA to publish a Section 6(f) Federal Register notice announcing our receipt of the request for voluntary cancellation, and inviting public comment for 30 days. (Ohio State University Extension Vegetable Crops, VegNet Vol. 8, No. 9. April 25, 2001)

2. Plastic mulch and flavor in Basil
Light reflected from colored mulches increases the size, aroma, and flavor of sweet basil leaves. Sweet basil (Ocimum basilicum L.) is a high-value specialty crop that is used fresh as an herb or as a dried spice to add a distinct aroma and flavor to food. ARS scientists, who pioneered the use of colored plastic mulches, found that two components of reflected light enhance plant growth: a low percentage of blue light and a high ratio of far-red to red light. Red plastic mulch reflects onto plants higher amounts of certain growth-enhancing wavelengths of sunlight. Basil is grown commercially and by many home gardeners outdoors in full sunlight over plastic mulches that conserve water, control weeds, and keep soil from splashing onto leaves. By using colors other than the standard black for these soil covers, the scientists were able to keep the benefits attributed to black plastic mulch, yet alter the amounts of blue, red, and far-red light reflected to developing leaves. The color of reflected light acted through the plants' natural growth-regulating system to increase leaf size, aroma, and concentration of soluble phenolics, some of which are important antioxidants. The study was reported in the March issue of the Journal of Agricultural and Food Chemistry. Coastal Plains Soil, Water, and Plant Research Laboratory, Florence, SC Michael J. Kasperbauer, (803) 669-5203, kasper@florence.ars.usda.gov
3. Bt GMO potato losses its resistance to nematodes

Studies of transgenic potatoes show that one cultivar with the Bacillus thuringiensis (Bt) gene has lost its resistance to the golden nematode, Globodera rostochiensis. This pest can wipe out entire potato crops by feasting on the plants' roots. So far, these tiny worms have attacked the U.S. potato crop only in New York. Using bioassay tests, ARS scientists found that the nematode infected and reproduced freely on Atlantic NewLeaf clone 6. This potato variety was produced by introducing the Bt gene for golden nematode resistance into the cultivar Atlantic. But two other clones of Atlantic NewLeaf from different Bt transformations with Atlantic maintained their resistance. DNA analysis of these Atlantic NewLeaf clones showed they contained the marker that indicates the presence of the gene for golden nematode resistance. This suggests that at some place in the transformation process that produced Atlantic NewLeaf clone 6, the expression of this gene was affected and the effect persisted through prerelease testing. The scientists presented their findings at the July meeting of the Potato Association of America in Colorado Springs, CO. Plant, Soil, and Nutrition Laboratory, Ithaca, NY  Bill B. Brodie, (607) 255-2158, ars-ithaca@cornell.edu (ARS web site, downloaded March 29, 2001, http://www.arserrc.gov/naa/home/fedpsnl.htm).

4. Fungal biocontrol in beets

Bacteria discovered near the roots of sugar beet plants may offer biological alternatives to chemical pesticides for controlling one of this crop's worst fungal enemies. Ongoing ARS studies have shown that certain strains of Pseudomonas root bacteria exude substances that stifle the growth of Cercospora beticola fungi. In nature, the bacteria compete with the fungi for space and nutrients on or near sugar beet leaves. Cercospora causes the sugarbeet disease leaf spot, which weakens susceptible cultivars by defoliation. Grown on 1.5 million acres, sugar beets supply an estimated 50 percent of America's sucrose. Beets that are somewhat genetically resistant to Cercospora have been identified, but they haven't been developed into elite commercial lines. Therefore, beet growers are forced to
rely on chemical fungicides to reduce the economic impact of Cercospora outbreaks. Scientists are exploring a more environmental friendly approach using two kinds of Pseudomonas bacteria: ND6-2 and ND9L. One strategy is to mix the bacteria's spores into a so-called biopesticide that could be sprayed onto the beet plant's leaves to prevent Cercospora fungal spores from germinating. Another approach is to isolate genes for the microbe's antifungal compounds and transfer these genes into sugar beets.

Molecular Plant Pathology Laboratory, Beltsville, MD
David Kuykendall, (301) 504-7072, dkuykend@asrr.arsusda.gov

5. Select Receives Approval for Vegetable and Strawberry Uses
(by John Masiunas, From: IL Fruit and Vegetable Newsletter) The herbicide Select (clethodim, manufactured by Valent) has received US EPA approval for use on potato, sweet potato, tomatoes, peppers (bell and non-bell), carrot, radish, strawberry, squash, pumpkin, muskmelon, watermelon, cucumbers, onions, and garlic. Select is a postemergence herbicide for the control of annual and perennial grasses. It does not control sedges or broadleaf weeds. Apply Select to actively growing grasses at the recommended height. Application timing varies depending on the grass species and its size. In mixed stands, apply when the first grass reaches the recommended growth stage for treatment. If the grasses are growing under stress, such as from lack of moisture or low temperatures, than regrowth by tillering may occur. Select generally provides better perennial grass control than Poast (sethoxydim). Rates vary depending on whether or not the grass is perennial. Select should be applied at 4 fl. oz./acre to annual grasses and 8 fl. oz./acre to perennial grasses. Timing of Select application varies depending on grass species and its height. For example, apply Select to quackgrass when it is 4 to 12 inches tall, while Select should be applied to rhizome johnsongrass when it is 12 to 24 inches tall. A second application may be necessary to perennial grass, but wait at least 14 days after the first application before making a re-application. On these vegetable crops and strawberries the do not apply more than 32 fl. oz. of Select per acre per season; except for radish where the maximum amount is 16 fl. oz. There are some restrictions and limitations for using Select on vegetable and strawberries. You should always use crop oil concentrate at 1 quart per acre when apply Select. Only with potatoes can you include liquid fertilizer or ammonium sulfate (AMS) . AMS improves the activity of Select on difficult-to-control grasses such as quackgrass, rhizome johnsongrass, and volunteer cereals. There is a preharvest interval for each crop. For example, the preharvest interval for tomatoes, peppers, and eggplant is 20 days while for squash, pumpkins, cucumbers, and melons the preharvest interval is 14 days. Always read the label, including the special supplemental label, before applying Select. (VegNet Vol. 8, No. 8. April 18, 2001 Ohio State University Extension Vegetable Crops)

6. Getting the most out of your pest control dollars
(This brief summary is adapted from a talk given by Jeff Kindhart at the Illinois Small fruit and Strawberry schools earlier this spring.) Pest control programs require a significant investment in both time and dollars for most Illinois specialty crops. There are a number of
different ways that growers might be able to get better return on these time and capital investments. Steps include using some IPM techniques, some newer technologies, and some common sense. IPM techniques that may help stretch your pesticide dollars include scouting and also forecasting programs such as those use for prediction of fire blight or scab in apples. Scouting techniques often involve visual observation of the crop and in many cases the use of pheromone traps for insect population monitoring. For several years Extension has recommended using forecasting programs of various kinds ... an Illinois supplier of software (disease forecasting models, etc.) and weather monitoring and logging equipment is Spectrum Technologies of Plainfield. They're on the web at http://www.specmeters.com/index.htm, and you can reach them by phone at 1-800-248-8873. The good news is that these weather monitors/loggers and their corresponding software programs have become cheaper and more reliable in recent years. Forecasting programs in some cases allow decisions that greatly reduce the number of overall sprays. A potential downside to using better monitoring and forecasting for key insect pests and diseases is that new problems that had been controlled by regular cover sprays may emerge. This possibility makes it important to maintain a thorough scouting program in fields and orchards where new approaches are tried. Additional technologies that may help stretch your pesticide dollars include ground speed monitoring equipment and improvements in sprayer control equipment. Ground speed monitoring devices such as Calc-An-Acre (from AGREM Precision of Anchor, IL, 309 723 3231, or http://www.agrem.com/AgregProducts.htm) help insure that sprayers are truly traveling at the intended ground speed used in your sprayer calibration formulas. These devices monitor ground speed either through sensors mounted on a non-driven wheel or through the use of a mounted radar gun. Changes in ground speed can easily result in over- or under-application of pesticides. Therefore, ground speed monitoring equipment for the tractor used for spraying may well be a good investment. Other advances in sprayer technology include photo-optic sensors (PATCHEN Inc. - Ukiah, CA 95482 - 1-888-PATCHEN, http://www.weedseeker.com/) use photo-optics to apply post-emergence herbicides only where weeds are growing. Other systems such as Tree-Sense (http://www.spraytec.com/articles/IntelligentSpray.htm) are designed to use with air blast or tower sprayers. Nozzles are turned on and off so that pesticide is applied only on trees, not to areas between plants. The number of nozzles turned on for each tree varies with the height of the tree. These systems can substantially reduce pesticide expenditures in many situations. Last but not least is careful attention to some common sense items. Sprayer calibration, while neither fun nor glamorous, is an important component of a cost effective spray program. In addition, periodic checking of spray pattern distribution is also important so that you are obtaining the required level of coverage. Spray patterns can easily be checked through the use of water or oil sensitive cards available from pest control supply houses such as Gemplers (1-800-382-8473, http://www.gemplers.com/) (and many others). One of the more overlooked items that growers should consider is the quality of the water being used to fill the sprayer. Important water quality factors to consider include; hardness, pH, and quantity of suspended particles. Suspended particles (muddy pond water) can greatly reduce the efficacy of certain pesticides such as gramoxone extra. Although suspended particles are normally a problem only for growers using surface water, the water quality factors of hardness and pH are a concern for all water sources. Water hardness refers to the concentration of iron calcium and magnesium ions in the water. Many post-emergence herbicides are adversely effected by hard water; examples include Assure, Fusilade, Select, Post, Roundup, Touchdown, and 2,4-D. The May 15, 1998, issue of Penn State's newsletter, Field Crop News includes a good summary of the influence of water hardness (and it's still on the web at http://fcn.agronomy.psu.edu/fcn985.htm). Finally, the topic of spray solution pH ... Improper pH may affect pesticide absorption and can result in alkaline hydrolysis of certain classes of pesticides. A dramatic example of the problem with alkaline hydrolysis is provided by the insecticide Imidan. Imidan is quite stable at pH of 4.5 (23-day half-life). As the pH increases to 7.0, the half-life decreases to less than 12 hours,
and at a pH of 8.3, the half-life is less than 4 hours. For more on this topic, read "Effect of pH on Pesticide Stability and Efficacy," by Winand Hock, on the web at http://pmep.cce.cornell.edu/facts-slides-self/facts/gen-peapp-ph.html. There are a number of adjuvants that can be added to the sprayer tank to combat issues with water hardness and pH. Always read and follow pesticide labels. Many have statements regarding adverse effects, such as diminished efficacy, from hard water or high pH. Some even contain statement recommending specific adjuvants. Water samples can be analyzed at any number of labs for water hardness. The pH factor can also be analyzed at most of these same labs, but pH of well, pond and even municipal water supplies may fluctuate throughout the growing season. Because of this and also because the items being added to the spray tank may influence spray solution pH, growers may wish to purchase a pH tester or a supply of litmus paper to use to determine the pH of the spray solution after all components have been added. Jeff Kindhart (618-695-2444; kindhartj@mail.aces.uiuc.edu) (The Illinois Fruit and Vegetable News, Vol. 7, No. 5 April 11, 2001)

7. Seedling blights and Damping-off
Soils are warming, especially with this recent warm weather, but cool, wet soils and humid conditions can still favor the development of seedling blights and other diseases such as damping-off. When seed germination and growth is slowed by unfavorable environmental conditions, seeds and seedlings are susceptible to attack by one or more soilborne fungi. Preemergence damping-off occurs when the seeds rot or seedlings decay before they emerge. Postemergence damping-off happens when young emerging seedlings are pale, wilted, mis-shaped or rotted at the soil line or below. When postemergence damping-off occurs, the base of the stem may appear water-soaked before turning color and rotting. Cabbage, cauliflower, tomato, and bean seedlings may be girdled by dark colored sunken cankers. When this occurs, plants can shrivel and become dark and woody causing wirestem or collar rot symptoms, but the plants normally do not collapse. Integrated control measures for preventing seedling blights and damping-off start with using high quality seed of recommended disease resistant varieties, and treating that seed before planting.
Conditions in the field that favor disease development are heavy, poorly drained soils, heavy seeding rates and overcrowded conditions, poor air circulation, planting too deep and over fertilization, particularly with nitrogen. Cultural practices that encourage healthy plant growth (proper drainage, balanced fertility, proper seeding rates and depths, etc.) will help prevent field conditions favoring disease development. In greenhouses, drainage is also important, as is pasteurization. Pasteurize soil, preferably with heat, before planting. Be sure to clean and disinfect flats, tools, plant containers and benches between plantings. Cleaning and disinfecting is very important because the organisms that cause damping-off can reside in soil particles left on tools or benches or in plant containers, and flats and re-infect new soil and plants. These items can be disinfected using several methods. One is steaming them at 180 to 200 degrees F for 30 minutes. Potting materials and tools can be dipped or swabbed with full-strength alcohol (70 to 100 percent) for 1 to 2 minutes but do not rinse. Another method is dipping in a household bleach solution (6 gallons household beach in 100 gallons water) for 10 seconds. First brush materials free of all soil, then spray with or dip in clean bleach solution and allow them to dry. Fungicides may be used in some crops and circumstances to prevent damping off. The table below fungicides that can be used as preventive seed treatments, drenches or soil treatments for damping-off. Please read and follow all label instructions for exact rates, timing, application procedures, and restrictions.


<table>
<thead>
<tr>
<th>Crop</th>
<th>Fungicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabbage, broccoli, Brussels sprouts, cauliflower</td>
<td>captan, mefenoxan, thiram</td>
</tr>
</tbody>
</table>
9. **WEED COMPETITION IN MELONS.**

In preliminary studies initiated last fall, we demonstrated that cantaloupe and watermelon vine growth, numbers of blooms and fruit, and yields were severely reduced by weed competition. Compared to watermelon plots maintained weed-free from the time of emergence, watermelon plots where weeds were allowed to compete for a period lasting 2 weeks after planting (WAP) showed that the lengths of watermelon vines were shortened by an average of almost 10%. Weeds allowed to compete for 4 and 5 WAP reduced the vine length by over 40%. At 8 WAP, the total number of watermelon fruit was reduced and delayed when weeds were removed at 2 and 3 WAP compared to the weed-free watermelons. Cantaloupes showed a decrease in vine lengths of almost 20% when weeds were allowed compete until 3 WAP. The total number of blooms and fruits were reduced significantly for the same time period. At harvest, the total cantaloupe fruit weight was reduced 59% when weed removal was delayed until 3 WAP. Melon vine growth and yields were impacted by weed competition for a period of 2 to 3 WAP. (Kai Umeda, Maricopa County Veg Newsletter, Arizona State Univ., vol 8, issue 4 April 13, 2001)

10. **Mite Control**

Most common spider mites are closely related species in the genus *Tetranychus* and cannot be reliably distinguished in the field. However, there is little need to do so since their damage, biology, and management are virtually the same. The presence of webbing is an easy way to distinguish them from all other types of mites. To the naked eye, spider mites look like tiny moving dots; however, you can see them easily with a 10X hand lens. Adults have eight legs and an oval body with two red eyespots at the head end of the body. Females usually have a large, dark blotch on each side of the body and numerous bristles covering the legs and body. Immatures resemble adults, except the newly hatched larvae have only six legs. Eggs are spherical and translucent, like tiny droplets, becoming cream colored before hatching. Mites cause damage by sucking cell contents from leaves. A small number of mites is not usually reason for concern, although populations levels high enough to show visible damage to leaves can be damaging to plants. Initial damage shows up as a stippling of light dots on the leaves; sometimes the leaves take on a bronze color. As feeding continues, the leaves turn yellow and drop off. On vegetable crops, such as squash, melons, and watermelons, loss of leaves can have a significant impact on yield and result in sun burning. Often leaves, twigs, and fruit are covered with large amounts of webbing. Damage is worse when compounded by water stress.

Spider mites have many natural enemies that often limit populations. Adequate irrigation is important because water-stressed plants are most likely to be damaged. Broad-spectrum insecticide treatments for other pests frequently cause mite outbreaks, so avoid these when...
possible. Growers have had good results with back-to-back applications of sulfur and/or Kelthane. Since spider mites reproduce rapidly in hot weather and generation time can be less than a week, it is imperative that subsequent treatments be made every 5 days to target new larvae emerging from eggs. Sulfur can be used on some vegetables, but will burn cucurbits. Do not use sulfur if temperatures exceed 90o F and do not apply sulfur within 30 days of an oil spray. (Gene McAvoy, SW Florida Pest and Disease Hotline for April 20, 2001)

11. Whitefly control in Florida
Whiteflies populations are building up across the area. Counts as high as 50 per plant have been reported, with eggs and immatures present. IGR’s such as Knack and Admire can help populations in check where Admire has begun to wear off. With the current tomato market, many growers are hesitating to spray. Growers can also turn to broad-spectrum materials including a variety of pyrethroids, such as Asana, Baythroid, Danitol and Warrior as well as some of the organo-phosphates (Monitor) and carbamates such as Thiodan. As we approach the end of the season, effects on beneficials become less of a concern and cost and efficacy assume greater importance. (Gene McAvoy, SW Florida Pest and Disease Hotline for April 20, 2001)

12. Pinworm control in tomatoes
Reports indicate that pinworms are increasing in a number of areas especially on field margins. The tomato pinworm (Keiferia lycopersicella) is a small, microlepidopteran moth that is often confused with closely related species with similar habits. Eggs are laid singly or grouped in two's and three's. The eggs are opaque to pale yellow, but turn orange before hatching. The first instar larvae spin a tent of silk over themselves and tunnel into the leaf. Mature larvae abandon the host and form a loose pupal cell of sand grains near the soil surface. The adult emerges from this pupal cell two to four weeks later. Although the life cycle is lengthy, multiple generations overlap and infestations quickly mount to damaging proportions. Seven or eight generations or more per year can be expected.

Damage to tomatoes results from the feeding of larvae on leaves, stems and fruit. Initial injury is slight and appears as a small leaf mine. Later injury includes leaf folding and leaf tying. Mature larvae may abandon the leaf and bore into the fruit leaving a small "pin" size hole. Secondary damage results when plant tissues become infected by pathogens and the plant dies or the fruit rots. Approximately 60 to 80 percent of tomato fruits may become infested in a single season.

Pheromone traps give an even earlier warning. Place one trap per 10 acres at least 25 paces inside of field. When 3 to 5 moths are caught per trap per night, then mating disruption should be initiated. Insecticidal control can be achieved with products such as SpinTor, AgriMec, Proclaim and Avaunt. Tomato, potato, eggplant, and tropical soda apple (S. bahamese L), a solanaceous weed, are the only recorded hosts in Florida. Thus, the summer break is effective in reducing populations to low levels, except possibly where soda apple is prevalent. Pinworms attack both leaves and fruit. (Gene McAvoy, SW Florida Pest and Disease Hotline for April 20, 2001)

13. More on pinworm control in Florida
Although reports indicate that pinworms are increasing in a number of areas especially on field margins, there have been relatively few reports of damage to fruit this season. The
tomato pinworm (Keiferia lycopersicella) is a small, microlepidopteran moth that is often confused with closely related species with similar habits. Pheromone traps will help give an early warning. When 3 to 5 moths are caught per trap per night, then mating disruption should be initiated. Insecticidal control can be achieved with products such as SpinTor, AgriMec, Proclaim and Avaunt. Tomato, potato, eggplant, and tropical soda apple (S. bahamense L), a solanaceous weed, are the only recorded hosts in Florida. Thus, the summer break is effective in reducing populations to low levels, except possibly where soda apple is prevalent. (Gene McAvoy, Southwest Florida Pest and Disease Hotline, May 4, 2001)

14. Info on sending produce to another state
Sending produce to another state? This USDA/APHIS site can help avoid costly delays. The Federal & State Quarantine Summaries is designed as a reference tool for nursery stock growers, brokers, purchasers, and others involved in the buying, selling, and interstate transport of nursery and greenhouse plant crops. It outlines the basic quarantine and other plant health requirements of APHIS, all 50 states, and Puerto Rico. The information presented is designed as an aid to help users avoid delays, rejections of plant material shipments, and introduction of harmful pests into new areas. Go to http://www.aphis.usda.gov/npb/F&SQS/sqs.html (Gene McAvoy, SW Florida Pest and Disease Hotline for April 20, 2001)

15. Gummy stem blight strains resistant to Azoxystrobin (Quadris)
Some late breaking news from Dr Tom Kucharek - which missed the hotline Syngenta, the company formed by the merger of Zeneca and Novartis has indicated that resistant (insensitive) isolates to azoxystrobin of Didymella bryoniae, the fungal pathogen that causes gummy stem blight in cucurbits, have been found in Delaware, Maryland, and Georgia. According to Dr. David Langston, Extension Plant Pathologist in Georgia, the resistant (insensitive) isolates to azoxystrobin that have been found so far in Georgia have originated from watermelon and cucumber. Azoxystrobin affects sensitive isolates at a single site associated with electron transfer in the mitochondria. Such single site-type of compounds are highly likely cause a selection pressure for resistant (insensitive) strains.

THUS, USE RESISTANT MANAGEMENT STRATEGIES WHEN USING AZOXYSTROBIN BY: 1) REDUCING INOCULUM FOR DISEASE WITH EVERY POSSIBLE NON- CHEMICAL TECHNIQUE AVAILABLE, 2) ALTERNATING THE USE OF AZOXYSTROBIN WITH BROAD-SPECTRUM FUNGICIDES SUCH AS MANCOZEB OR CHLOROTHALONIL, AND AVOIDING THE INTRODUCTION OF RESISTANT STRAINS ONTO YOUR PLACE OF BUSINESS BY PRODUCING OR PURCHASING DISEASE-FREE TRANSPLANTS. (Gene McAvoy, Univ. Florida, e-mail, April 20, 2001).

16. Command herbicide registration
Command 3ME. FMC Corp. has released a federal label for Command 3 ME. The new label includes directions for weed control in succulent beans, cabbage, cucumbers, melons, succulent peas, peppers, squash, and sweet potato. Command 3ME is not labeled for use on Jack-O-Lantern pumpkins. However, Command 4 EC may still be used on Jack-O-Lanterns. Also, existing Section 24C labels for Command 4 EC on cabbage, peppers and cucumbers are still in force. Users should ensure that Command (both formulations) is applied in such a
manner to minimize drift. Avoid application during unfavorable weather conditions, such as winds in excess of 3 mph, hot and dry weather and during temperature inversions. Many crops are sensitive to soil residues of Command. Consult the label to determine appropriate re-plant intervals.

To prevent crop injury vegetable seeds and roots of transplants must be placed deep enough to be below the chemical barrier formed by an application of Command. The 4EC and 3ME products both have potential to cause temporary bleaching of labeled crops, and cultivars may vary in their tolerance. However, the crop should grow through temporary bleaching with no adverse impacts. NOTE: Vegetable growers must read and accept the Terms of Sale or Use included on page 17 of the Command 3ME label. Upon use of the product, FMC Corp. considers the user to have accepted all terms and conditions of the label including a waiver and release from all liability of FMC for failure of the product to perform, or crop damage resulting from use.

- Beans (succulent) - Apply 0.4 to 0.67 pints/A.
- Cabbage - Apply 0.67 pints/A for direct seeded cabbage and 0.67 to 1.3 pints/A for transplanted cabbage. Use the lower rates on coarse soils and the higher rates on fine soils.
- Cucumbers - Apply 0.4 to 1.3 pints/ A. Use the lower rates on coarse soils and the higher rates on fine soils.
- Peppers (EXCEPT BANANA PEPPERS) - Apply 0.67 to 2.67 pints/ A. Use the lower rates on coarse soils and the higher rates on fine soils.
- Peas (succulent) - Apply 1.3 pints/A.
- Squash (includes processing pumpkins) - Apply 0.67 to 2 pints/ A for winter squash. Apply 0.67 to 1.3 pints/A for summer squash. Use the lower rates on coarse soils and the higher rates on fine soils.

Refer to the label for complete instructions.
(VegNet  Vol. 8, No. 10. May 2, 2001, Ohio State University Extension Vegetable Crops)

17. Pepper weevil control in Florida
Pepper weevil populations have reached their typical end of season peak with respondents reporting dramatic increases in several widely scattered locations. A number of respondents have reported observing extensive weevil damage to flower buds and small fruit. Several growers have reported experiencing serious losses from pepper weevils, especially in their hot pepper varieties. Vydate is the standard control and has given pretty good results even at 2 pts/acre when sprayed weekly in Phil Stansly's trials at the Southwest Florida Research and Education Center. Despite this, many growers have indicated disappointing results in obtaining satisfactory control in the field. Some growers have terminated older plantings where weevils had become unmanageable. A number of growers have indicated obtaining good results in controlling weevils with either Capture or cryolite. All currently labeled
materials are difficult to work into an IPM program once plantings begin to be harvested due to the 7 day PHI in force for all of them.
Sanitation is important. Remove old crops and nightshade (an alternate host) and disk crop residues under as soon as harvesting has terminated. Maintain fields free of volunteer pepper and other potential hosts to reduce survival of pepper weevil populations over the summer. (Gene McAvoy, Southwest Florida Pest and Disease Hotline, May 4, 2001)

18. Spider mite control in Florida
Spider mites remain widespread on a number of crops including eggplant, tomato, watermelon and other cucurbits. A number of growers report applying repeat applications of miticides aimed at spider mites. Several respondents have indicated that spider mites infestations are most severe where stands of nightshade adjoining plantings. This observation suggests that control of nightshade in unplanted area adjacent to fields will help eliminate this potential source of infestation and may help them reduce possible spider mite problems. Mites cause damage by sucking cell contents from leaves. On vegetable crops, such as squash, melons, and watermelons, loss of leaves can have a significant impact on yield and result in sun burning. Often leaves, twigs, and fruit are covered with large amounts of webbing. Damage is worse when compounded by water stress.

Spider mites have many natural enemies that often limit populations. Adequate irrigation is important because water-stressed plants are most likely to be damaged. Broad-spectrum insecticide treatments for other pests frequently cause mite outbreaks, so avoid these when possible. Growers have had good results with back-to-back applications of sulfur and/or Kelthane. Since spider mites reproduce rapidly in hot weather and generation time can be less than a week, it is imperative that subsequent treatments be made every 5 days to target new larvae emerging from eggs. (Gene McAvoy, Southwest Florida Pest and Disease Hotline, May 4, 2001)

19. Powdery mildew in peppers
Powdery mildew is present in scattered locations in older pepper fields. Powdery mildew is uncommon on pepper in SW Florida. The disease in pepper is caused by the fungi Leveillula taurica. Leaves with mildew growing on the undersurface may show a patchy yellowish or brownish discoloration on the upper surface. The edges of infected leaves may roll upwards exposing the white, powdery fungal growth. Diseased leaves drop from the plants and leave the fruit exposed to the sun, which may result in sunburning. Powdery mildew can be severe and can cause heavy yield losses. The fungus survives between crop seasons on other crops and on weed species. The degree of survival depends on environmental conditions. Because of the wide host range of the fungus, it is difficult to control the amount of inoculum that survives from one season to the next. Thus, simple sanitation methods in and around pepper fields may not provide a sufficient reduction in the primary inoculum to provide disease control. Most pepper cultivars do not possess acceptable levels of resistance to powdery mildew. Fungicides can provide satisfactory control and prevent economic loss if applied during the early stages of the epidemic. Effective control requires spraying with high pressure and high volume for optimum penetration of the crop canopy by the fungicide. Good coverage is necessary for satisfactory control.
(Gene McAvoy, Southwest Florida Pest and Disease Hotline, May 4, 2001)
20. Savey DF for mite control in blackberries

EPA has approved use of Savey 50DF for control of mites on caneberries (blackberries and raspberries). The preharvest restrictions is 3 days. One application early will give season control, as it kills eggs and immature stages. If you need a copy of the supplemental label, contact your Gowan distributor. Garth Major 850-668-1645 (Gina Fernandez, North Carolina State Univ. e-mail, May 7, 2001).

21. Quadris Registered for Strawberries in North Carolina

QUADRIS CLEARED FOR USE BY NORTH CAROLINA STRAWBERRY GROWERS FOR ANTHRACNOSE CONTROL

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During the last week we have visited numerous fields and obtained additional samples through the Plant Disease and Insect Clinic that had anthracnose fruit rot. Earlier in April, it appeared that the incidence of anthracnose would be low and we worked directly with affected farms to determine the best course of action using available management strategies and registered products. Integrated management strategies were outlined last week in a note [http://ipmwww.ncsu.edu/current_ipm/01PestNews/01News2/fruitveg.html]. However, with the sudden occurrence of numerous farms reporting problems, there was considerable concern of widespread incidence. We have isolated Colletotrichum acutatum from infected plants, an aggressive pathogen not controlled satisfactorily with current options available to strawberry producers. Please see last weeks note ([http://ipmwww.ncsu.edu/current_ipm/01PestNews/01News2/fruitveg.html] that also differentiates anthracnose from Alternaria fruit rot. We have encountered substantial crown rot due to the C. acutatum strain, an unusual event. This phase is difficult to differentiate from Phytophthora crown rot (see pictures in last week’s note). Send samples to the clinic for a sure diagnosis since it would be unproductive to use fungicides in situations where it is not warranted. Due to the incidence of anthracnose in the state, North Carolina Department of Agriculture (through the Pesticide Section’s Registration, Licensing and Information Unit) issued a crisis exemption for the use of Quadris Flowable, based on the recommendation of the North Carolina State University strawberry plant pathology specialist. We thank Meg Scott Phipps for her support in this matter and for the capable assistance of Lee Davis in the NCDA Pesticide Section. The package submitted by the Department of Plant Pathology was acted upon within 7 hours. I requested that a general press release not be prepared since our growers are currently in full production. Therefore, we request that Cooperative Extension Agents, NCDA field personnel, and other farm advisors ensure all interested farm clientele become aware of this action. Quadris is a protectant fungicide and should be applied prior to or in the early stages of disease development. Applications may be made by ground only. Use sufficient water volume for adequate coverage (a minimum of 20 gallons of water is recommended). Apply QUADRIS at 7 to 14 day intervals at 6.2 to 12.4 fl. oz./A. Applications can be made up to day of harvest. Use the higher rate when conditions for disease epidemics are severe. No more than 3 sequential applications of Quadris should be made before alternating with fungicides that have a different mode of action. Do not alternate or tank mix with fungicides to which resistance has developed in the pathogen population. (Quadris is extremely phytotoxic to certain apple varieties; extreme care must be used to prevent injury to apple trees.). Do not apply more than 4.6 pints of product per acre per crop (1.2 lbs ai/A). Based on research conducted by North Carolina State University personnel, Quadris tank-mixed with Captan has provided the best control of the anthracnose fruit rot stage. A full report (Pest Control
Technology For the Control of Anthracnose and Botrytis in Strawberry) of research trials has been posted at the following address through the Southern Region Small Fruit Center (http://www.smallfruits.org/Pestinfo/pestinf.htm). This site will be good to review to learn about Quadris efficacy against anthracnose.

Quadris does not cure infected plants nor is it completely effective at preventing fruit rot. In fungicide trials Quadris has been found to reduce anthracnose fruit rot by about 60% once an epidemic starts. It should function as a helpful tool for growers who adopt an IPM program. Therefore, growers need to implement complementary disease management strategies. If anthracnose fruit rot occurs in a hot spot, the infected plants should be pulled immediately, placed in a bag or container, and removed from the field. Growers should also consider removing plants from rows immediately adjacent to the infected area. In cases where growers desire reduced fungicide usage, Quadris could be applied to plants surrounding such hotspots (e.g. 3-4 beds beyond the infected area). We have had good success to contain the problem using this strategy. However, the anthracnose pathogen can infect plants without showing symptoms until warm and wet weather occurs resulting in widespread fruit rot. A reduced risk recommendation, which requires more fungicide use, is to use Quadris or Quadris tank-mixed with Captan, applied as a general field application. Remove infected fruit from the field when practical to limit the build-up of spores. NEVER move from an infected area to a non-infected area without washing and changing cloths, especially if plants are wet. Such movement will lead to spread of the disease. I would also suggest that growers with known anthracnose problems apply Quadris before predicted rain events if it has not been applied in the last 7 days.

Quadris should not be used indiscriminately. Most growers in North Carolina have no or low risk of anthracnose and Quadris is not needed in such cases. Quadris has a specific mode of action and improper use will make the fungicide ineffective for the control of anthracnose if the problem pathogens acquire resistance. Resistance management is an essential component of using Quadris. (via Barclay Poling, No. Carolina State Univ. Extension, May 4, 2001).

22. DITCHBANK WEED CONTROL IN ARIZONA.

Incidents have occurred this spring where alleged applications of diuron for weed control on ditchbanks resulted in the movement of the herbicide into melon fields through drip irrigation. Diuron injury symptoms on the melons were veinal chlorosis and yellowing of the foliage followed by eventual necrosis in some of the worst cases. Diuron must be applied to ditchbanks when there is no water in the ditch and during the non-cropping season to minimize any crop injury. To avoid crop injury, it is critical to minimize the movement of diuron in any irrigation water. Diuron should be applied when rainfall is expected so that moisture can fix it to the soil. An alternative method to ensure that diuron fixes to the soil is to fill the ditch with water and flush it out from the system before refilling with irrigation water. Diuron provides long term weed control along ditchbanks depending on the rate that is applied. Other non-selective soil sterilant-type herbicides should be used with caution near water to avoid off-target movement.

23. SPRAYER CALIBRATION STEPS FOR BOOM SPRAYERS

(1) On an area that best represents the average topography for the area to be sprayed, measure and mark off the Calibration Distance that coincides with your band width or nozzle spacing. See Table 1. (2) Select a safe speed which can be maintained while spraying. Note and record the engine RPM’s and the gear selection so the same speed is used during calibration and application. (3) With the tractor traveling at this selected speed,
time and record the seconds needed to travel the Calibration Distance. (4) Fill the sprayer, engage the pump and adjust the pressure regulator to the desired boom pressure (between 15 and 50 PSI for herbicides). Collect all the water from one nozzle for the same number of seconds needed to travel the Calibration Distance. Example: with 20" nozzle spacing, if it took 35 seconds to travel 204’, collect the discharge of one nozzle for 35 seconds. The number of fluid ounces collected equals the gallons per acre (GPA) of output of that nozzle. Example: 20 ounces collected equals 20 GPA. (5) Repeat Step 4 two more times, collecting water from a different nozzle each time. The average number of ounces collected from each of the three nozzles is equal to the gallons of water applied per acre for that boom. Remember to maintain the same pressure and travel speed when spraying.

Table 1. Select the Calibration Distance to be used based on nozzle spacing if broadcast applying, or on band width if band applying.

<table>
<thead>
<tr>
<th>Band Width or Nozzle Spacing</th>
<th>Calibration Distance</th>
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<tbody>
<tr>
<td>10 inches</td>
<td>408 feet</td>
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<tr>
<td>12 inches</td>
<td>340 feet</td>
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<tr>
<td>16 inches</td>
<td>255 feet</td>
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<td>18 inches</td>
<td>227 feet</td>
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<td>20 inches</td>
<td>204 feet</td>
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<td>28 inches</td>
<td>146 feet</td>
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<td>32 inches</td>
<td>127 feet</td>
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<tr>
<td>36 inches</td>
<td>113 feet</td>
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<tr>
<td>40 inches</td>
<td>102 feet</td>
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