UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

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Crop conditions

This issue of Vegetable Notes provides updated information on label changes for the 2007 growing season. Since this is an off-year for the publication of the New England Vegetable Management Guide, it may be useful to place this newsletter with your 2006-2007 Guide so that the information is readily accessible. Please contact any of the authors if you need clarification or need additional information.

The end of this week certainly appears to be bringing with it the promise of Spring. I know that a few growers have moved ground and planted peas or other early crops. For most, however, it has just been too cold and too wet to do anything, including plant corn under plastic. For some, flooding from the rain and snowmelt of the last week will delay their start a few extra days. The long range forecasts look promising and it is my hope that our fields look very different a week from now. Good luck and may Spring finally be with us.

A. *Rich Bonanno, UMass Extension*

Some projects of the UMass vegetable team for this season

This year the UMass Extension Vegetable Program is working on a number of projects that address disease and pest management in sweet corn and cucurbits. Funding for these projects has been provided by the Massachusetts Department of Agricultural Resources, EPA Region I, The Sustainable Agriculture Research and Education program, Northeast IPM Center, and the Natural Resource Conservation Service.

The overall goal of the projects is to help growers obtain high quality crop yield by understanding and using IPM, especially advanced and reduced-risk IPM. This year we will be holding six **IPM Field Schools** -- field training programs conducted on farms throughout the state. The workshops will be led by UMass Extension vegetable, disease and weed professionals including Rich Bonanno, Amanda Brown, Andrew Cavanagh, Bess Dicklow, Ruth Hazzard, Pam Westgate and Rob Wick. While there will be an emphasis on cucurbit and sweet corn insect and disease scouting and pest identification, other vegetable crops and some fruit crops will also be covered. We will spend time in each crop, learning to scout and identify pests and talking about management decisions. At each of the IPM field schools there will be a microscope set up, and specialists from the UMass Disease Diagnostic Clinic for on-site disease identification. Whether you can attend one workshop or the whole series, you will learn some new skills and confidence for managing sweet corn, cucurbits, and other crops. We will address both organic and conventional growing methods. The first one is scheduled for Tuesday May 22, at Riverland Farm, Sunderland, MA. Further details about locations and registration information will be posted on our web site soon.

In order to help more growers use IPM in their sweet corn fields, we are developing a sweet corn IPM scouting guide with color photographs designed to guide you through the process of assessing the insect damage in the sweet corn. The guide lays out the IPM decision making process in an easy to use format. Our goal is to help growers do more scouting on their own and to develop a comfort level with making pest management decisions based upon their IPM scouting results.

This season we will continue to do season-long sweet corn IPM trainings on individual farms, training growers in scouting and decision-making. One of the new IPM tools that we will be contining to introduce to growers is the use of *Trichogramma ostriniae* wasps as a biological control for the European corn borer in sweet corn and peppers. These tiny wasps are mass-reared in the lab and released in small packets hung in the corn or pepper field. Female wasps search out and find ECB egg masses, insert their own eggs, and the developing larvae kill the ECB eggs before they hatch. We will work with growers to make releases of *Trichogramma ostriniae* in their early corn and in peppers, and then evaluate the effectiveness of the releases.

Another project will focus on cucurbit disease management. Diseases in vine crops have become a major challenge in recent years. We will work one on one with growers to understand what the critical problems are in their cucurbit crops. We will work with each grower to design cultural practices suited to their farm, fields, water sources and water management systems, equipment, cropping systems, etc. and to plan the most effective spray program. We will visit periodically, and make sure that diseases get accurately diagnosed at the UMass lab. Because fungicide resistance is a major concern, we will be screening field samples of powdery mildew and P. capsici, to determine whether there is resistance to particular groups of fungicides. Products likely to have resistance include strobilurins (eg Flint, Quadris, Cabrio) DMI's (eg Nova) and mefenoxam (Ridomil). Organic OMRI approved materials and biorationals will be incorporated into the plan, where applicable. For those who are interested, we will help growers use the Perimeter Trap Cropping (PTC) system to manage striped cucumber beetle and bacterial wilt of cucurbits, which cuts pesticide costs while maintaining or improving crop protection.

For growers involved with the NRCS EQIP program, where their contract includes pest management, we will be working

with NRCS field staff to assist with implementation of their IPM plan.

We are currently recruiting growers for these projects. If you are interested, or would like information please feel free to call the UMass Vegetable Program office (413-545-3696 or 413-577-3976).

2007 WEED MANAGEMENT UPDATE

Following are some of label changes for 2007. They include resistance management, updates on Chateau, Stinger, Sandea, Command, Gramoxone Inteon, and Callisto. Some are new and some are already in the Guide but all are worth a mention.

Remember that for all pesticides in the New England Vegetable Management Guide, we have listed the resistance management group of that pesticide. These groups are not interchangeable between herbicides, fungicides, and insecticides. So a 1 in herbicides is not the same as a 1 in insecticides, for example. These resistance management groups allow an applicator to tell which pesticides are related so that, if possible, growers can rotate chemistries to avoid the incidence of resistance to that pesticide or group of pesticides.

A small fruit herbicide **Chateau (flumioxazin)** is registered in grapes and strawberries. In grapes it is registered for both preemergence and postemergence control of weeds. If grapes are between 2 and 3 years old, the rate is 6 oz/acre. If grapes are at least 3 years old, the rate is 12 oz/application and 24 oz/year. It can be applied in the Spring as an alternative to either Sinbar (terbacil) or Princep (simazine). For postemergence control, use a crop oil concentrate at 1% or a non-ionic surfactant at ¼% by volume. A residual grass herbicide is still needed.

In DORMANT strawberries, the rate is 3 oz/acre. Also apply a crop oil concentrate at 1% or a non-ionic surfactant at ¼% by volume. A residual grass herbicide such as Devrinol (napropamide) or Dacthal (DCPA) is still needed. Chateau will control emerged chickweed, field pansy, and oxalis if sufficient contact is made with the weeds. 2,4-D may still be required to control other emerged weeds.

Also in strawberry, growers have been experimenting with using oats as a living or dead mulch. Some tips follow. They include planting in mid-August at a rate of 100 lb/acre either broadcast or banded. Use of Devrinol or Dacthat at renovation will adversely affect the germination and growth of the oats. Herbicide applications may still be required after establishment. Look for the oats to grow at least 18 inches tall. The oats will winter kill and provide a base to hold straw over crops from blowing away.

In Cucurbits, keep in mind that all herbicides are not registered in all crops. Please check the current New England Vegetable Management Guide for information to help with decisions regarding the use of Command (clomazone), Strategy (ethalfluralin + clomazone), Sandea (halosulfuron), Alanap (naptalam), Prefar (bensulide), and Curbit (ethalfluralin).

The new formulation on the market for paraquat is Gramoxone Inteon. This formulation is designed to be safer to the user, however, it is still restricted use and the signal word is still "Danger". Gramoxone Inteon contains an "alginate" which is made from seaweed and slows absorption into the bloodstream. There is also an alerting agent that smells like decaying grass, an emetic and purgative, and a green dye. The new formulation also comes with some rate changes. With the old formulation (Gramoxone Max) the rate range was 1.7 to 2.7 pints per acre. Rates for the new formulation are 2.5 to 4 pints/acre.

Stinger (clopyralid) has some expanded labels for beets, turnip, and spinach. Asparagus, however, is no longer registered. Stinger provides postemergence control of many unusual weed species including galinsoga, ragweed, pineapple weed, clover, vetch, Canada thistle, goldenrod, aster, and chrysanthemum.

The **Sandea (halosulfuron)** label has been expanded to include beans and sweet corn. The herbicide Permit (halosulfuron) has been discontinued in New England. Permit may return but it will not contain just halosulfuron.

Command (clomazone) 3ME has fully replaced Command EC. It is registered in many crops including beans, cabbage, cucumbers, melons, peas, peppers, squash, and sweet potato. It is NOT registered in pumpkin. Command ME is also one of the 2 active ingredients in Strategy which IS registered in pumpkin. Command ME has low volatility and can be applied to the soil surface rather than needing to be incorporated into the soil.

Callisto (mesotrione) appears in the Guide for weed management in sweet corn. Callisto is considered to be a supplement to atrazine and a grass herbicide, it allows reduced rates of atrazine, controls triazine-resistant lambsquarters, and provides both preemergence and postemergence control of many broadleaf weed species and some small grasses. Callisto can slow the growth of corn planted in cold soil in the spring. As a result, most use in New England has been postemergence.

There are two prepacks containing Callisto. One is Lumas and one is Lexar. They are mixtures of atrazine, Callisto, and Dual II Magnum (metolachlor). For sweet corn growers in New England, Lexar has too much atrazine in it. Lumax has the right ratio, 3 quarts of Lumax provides 6 oz of Callisto, 1.5 pt Dual, and0.75 lb atrazine. Because of cold soil issues with Callisto, use of Lumax makes more sense later in the season when soils are warmer and corn growth is much faster.

In 2006, there were reports of crop injury when Sandea was applied over the top of corn either alone or tank-mixed with Callisto. This is jury is from Callisto being sprayed into the whorl. Injury symptoms are ear malformations and restrictions. Anytime the corn is over 6" height, it is best to use drop nozzles to avoid crop injury.

Aim (carfentrazone) is also registered in corn for postemergence control of annual weeds including pigweed, lambsquarters, and velvetleaf. The rate range is 0.33 to 0.67 lb/acre. Add a nonionic surfactant at 1 qt/100 gal of spray. If corn is over 8" high, drop nozzles must be used. Some speckling of the corn foliage might occur.

When tank mixing pesticides, always be sure to use the right mixing order to avoid issues. The mixing order is Wettable Powders (WP), Dry Flowables (DF) or Water-dispersible Granules (WDG), Water-dispersible liquids (AS), Emulsifiable Concen-

trates (EC), Water-soluble Liquids (S), and Surfactants.

All growers should take pesticide safety seriously. Read and follow all label directions, follow the Worker Protection Standards including the REI. Keep adequate records and wear all required personal protective equipment (PPE). Always strive to keep yourself, your family, and your employees safe.

A. Richard Bonanno, UMass Extension

NEW FUNGICIDE OPTIONS FOR THE 2007 GROWING SEASON

The single most pressing issue concerning fungicide usage in 2007 remains the rapid development of fungicide resistance in pathogen populations and the subsequent loss of effectiveness of the newer systemic products. The fungus that causes Powdery mildew disease in cucurbits rapidly developed resistance to both the sterol-inhibiting (DMI) and strobilurin fungicide groups. In New York and Mid-Atlantic States, Amistar, Quadris, Cabrio, and Flint (Group 11 fungicides) are no longer recommended due to control failures. The sole remaining strobilurin fungicide, Pristine, also contains boscalid. The earliest chemicals in the DMI family (Group 3), i.e. Bayleton are no longer effective; Procure and Nova are effective only if applied at the maximum rate.

There are a few cardinal rules when choosing an effective fungicide program:

- Start applications when the disease **first** appears
- Make a **single** application from each **systemic** group
- Always apply systemic fungicides in a **mixture** with a contact fungicide (M groups)
- Use the **most effective** fungicide **first**
- **Multiple** diseases per fungicide
- Consider **residual period** when determining spray intervals

New options for 2007 include Omega 500 F (fluazinam), Group 29; Quintec (quinoxyfen), Group 13; SCALA SC (pyrimethanil) Group 9; Maestro 80 DF (captan); Ranman (cyazofamid) Group 21 and Bravo S (chlorothalonil plus sulfur) Group M5 plus Group M1. Products with new labels and/or new Supplemental labels include Dithane M45, Maneb 75 DF, Endura, Kocide 3000, Manex, Terraclor 75 WP, and Curzate 60 DF.

***Omega 500 F** has a multi-site mode of action and is registered on potatoes. In research trials, Omega alternated with other products gave satisfactory control of the foliar and fruit phases of *Phytophthora* Blight on peppers.

***Quintec** is the only member of FRAC Group 13 and was used as a successful rotational partner with DMI and strobilurin fungicides in New York for Powdery mildew under a Section 18 exemption.

SCALA SC fungicide is registered on bulb vegetables, potatoes and other tuberous/corm vegetables, strawberries, and tomatoes and is effective against *Botrytis* (Gray Mold) and *Alternaria* (Early Blight).

***Ranman** is effective against Downy Mildews and *Phytophthora* Blight on cucurbits, potato, and tomato.

***Maestro** is registered on raspberry, grape, strawberry, cucumber, potato, and tomato against a wide variety of diseases including Downy mildews, anthracnose, Early and Late blight.

Bravo S is chlorothalonil enhanced with sulfur and is registered against Rusts, Powdery and Downy mildews, *Alternaria* and *Botrytis* on snap beans, many Brassica crops, potato, and tomato.

Dithane DF Rainshield (mancozeb) supplemental labeling allows its use in tobacco production including outdoor seedbeds, greenhouses, and field. Target pests include Blue Mold, Damping-off, stem rot, and target spot (*Rhizoctonia solani* and *Fusarium* species.)

Endura (boscalid) has been approved for use in cucurbit vegetables, head and stem brassicas, leafy brassica greens, root and tuber vegetables, and peas. Diseases controlled include *Alternaria*, *Botrytis, Cercospora* Leaf spot, Rust, White mold (*Sclerotinia* blight), and Gummy stem blight (*Didymella bryoniae*).

As *Phytophthora* blight remains an intransigent problem, it is good to review the many new alternative chemistries recently introduced. These materials are also useful against other "lower fungi" like Blue Mold, Downy mildews, and Late blight. These chemicals are only effective if applied in **combination** with another fungicide with a different mode of action (FRAC #) or a contact fungicide like copper or Bravo. They should never be applied more than **once** before alternating with fungicide(s) of different chemical groups. They will not be effective unless they are used in combination with good water management.

- **Allegiance** (metalaxyl) and **Apron** (mefenoxam) Group 4. Seed treatments.
- **Curzate** 60 DF cymoxanil, Group 27.
- **Forum** dimethomorph, Group 15
- **Gavel 75DF** zoxamide plus mancozeb, Group 22 plus Group M3
- **Phostrol, ProPhyt, Fosphite** potassium and sodium salts of phos phorous acid, Group 33
- ***Previcur Flex** propamocarb, Group 28
- **Reason** 500 SC fenamidone, Group 11
- **Tanos** famoxadone plus cymoxanil, Group 11 plus Group 27

****Not registered for use in Massachusetts.***

Bess Dicklow, UMass Extension

TO GROW OR NOT TO GROW BT SWEET CORN

One new option for managing damage from sweet corn caterpillar pests is the use of Attribute7 Insect Protected varieties that express the protein toxin of the bacteria Bacillus thuringiensis. These varieties are gaining popularity with growers nationwide, especially large wholesale producers and those growing corn for processing. About 5% of the sweet corn acreage currently produced is Bt sweet corn.

Many wholesale fresh-market growers in the Northeast have tried at least one variety of Bt sweet corn (i.e. TripleSweet7 BC0805) in the last couple of years. BC0805 is an 82-day bi-

color, synergistic variety, composed of 75% sugar enhanced (SE) and 25% supersweet (SH2) kernels. It is similar to 'Providence,' and the ear quality is widely accepted in the marketplace. The Bt protein is expressed in the SE kernels, the fresh silk, stalk, leaves and tassel. Attribute varieties were created by moving genes from Bt bacteria into field corn and then moving these genes to sweet corn through traditional breeding programs. These varieties are considered genetically-modified (GM) crops.

Like all new technology, GM technology comes with a list of advantages and disadvantages and has been surrounded by controversy since GM food crops were first introduced. To make an informed decision about whether GM technology, and in particular Bt sweet corn, is right for your business, you will need to understand both the risks of using these products and the benefits of using them. My purpose in writing this article is not to dissuade or persuade you from or into using Bt sweet corn, but merely to get you to think about both sides of the debate.

Potential Risks/Costs

Some risks/costs are obvious, such as increased cost of seed ($36-79/acre), and the potential of hastening resistance to a very useful insecticide (Bt), with a novel mode of action, through constant exposure of the active ingredient to the pest population. Based on the current costs for insecticide applications and the price difference between Bt corn and Providence, you will have to save 3 to 5 sprays per field to make Bt corn cost-effective. It may not be cost-effective to use Bt sweet corn for early plantings when pest pressure is low and only a couple of sprays are required. In addition, resistance to Bt has already occurred for other caterpillars, such as the diamondback moth, so it is a safe bet that it will also occur for sweet corn caterpillars. There are strict resistance management strategies (which have their own costs) that the company insists you comply with if you plant the new Bt seed. However, there are no guarantees these strategies will be employed by the growers who purchase the seed, or that they will hold off resistance for very long.

Some of the risks are not immediately obvious. They include risks such as a possible consumer backlash from customers fearful of eating corn with an insecticide in it, possible allergic reactions, secondary pest outbreaks (i.e. sap beetles), and liability and non-target effects from GM pollen drift.

Pollen from older varieties of Bt field corn was shown to have lethal and sub-lethal effects on monarch butterfly larvae. There was some concern that pollen drift from Bt corn could reduce the population of butterfly larvae on milkweed plants in and around corn fields. Additional research eventually showed that even potent strains of Bt could only reduce the population of caterpillars exposed in this way by less than 1% over time. However, this incidence certainly raises the question about what other organisms may be harmed by insecticide-laced pollen. Also, what if Bt pollen drifts into organic fields? Is the crop still organic? Who is liable for contamination? Associate Professor Yi Li at UConn has developed some new technology called a "GM-gene-deletor" which may eventually reduce risks currently associated with pollen drift. The new technology blocks the transfer of GM genes into pollen or seeds, without rendering the seeds sterile. So, progress is being made all the time to help make GM technology safer, but some of these solutions are still many years away from reaching the market.

Finally, while Bt corn eliminates the need for pre-silk European corn borer sprays and most whorl and pre-tassel sprays for fall armyworm, it does not control certain pests, such as flea beetles, cutworms and aphids. So it will still be necessary to scout, monitor and spray for these pests at different times during the season. It also does not eliminate the need for all corn earworm silk sprays. Although Bt corn controls low to moderate levels of corn earworm, protection breaks down at higher population levels, when the plant is under stress, and as the silk begins to die/dry, which stops the production of the toxin.

Potential Benefits

There are also many potential benefits of adopting GM-technology for sweet corn. They include a reduction of time, energy, and expense involved with pest control. Risk associated with applicator/worker insecticide exposure, spray drift, and ground and surface water contamination should be reduced. Also, there should be less soil compaction, less wear and tear on machinery, and reduced use of broad-spectrum insecticides (i.e. Warrior). Such insecticides kill beneficial insects which are spared by Bt (as well as several other selective insecticides), and these natural enemies can help reduce pest problems later in the season on sweet corn and on other nearby crops.

Corn earworm resistance to synthetic pyrethroids is becoming a critical problem in sweet corn production in the Midwest. Bt sweet corn could be used one year and synthetic pyrethroids used the next year, which would provide an effective resistant management technique. Ultimately, it may be resistance problems with corn earworms and synthetic pyrethroids that drive growers to this new technology if resistance management techniques are not employed.

Perhaps the single biggest potential benefit may be how Bt sweet corn simplifies pest management. Currently, it requires a considerable degree of management skill and a substantial investment of time to produce clean sweet corn consistently. In the near future, the use of several marketable Bt varieties, such as TripleSweet BC0805, will make it easier to achieve consistent sweet corn quality, without the occasional "worm" problem. Consistent quality may translate to higher yields and higher net profits. Imagine how easy it will be to grow good early corn when Seminis releases Roundup-Ready, Bt, 'Temptation' in 2009. No weed, insect or cold soil problems - even a child will be able to grow great early-season sweet corn! Of course, this is a double-edged sword, and could also lead to overproduction and lower corn prices. However, having no weed, insect or cold soil problems in early season sweet corn sounds pretty nice and may be worth a few extra dollars!

Notice how all the benefits of Bt corn depend upon reducing insecticide use aimed at controlling caterpillar pests. The problem is that reaping those benefits by reducing caterpillar sprays is not as simple or straightforward as it seems, due to the incomplete control of corn earworm. Some CT growers have told me that although they know that their single variety of Bt sweet corn probably doesn=t need spraying at low earworm levels, they apply the spray anyway because they are already out with the sprayer for the other non-Bt varieties in the same planting, and they just want to err on the "safe" side. To state the problem simply, growers bear

the costs of GM technology as soon as they order and plant the Bt seed. However, in order to reap the benefit of the new technology they must reduce insecticide use. For this to occur, new action thresholds for Bt corn must be constructed so that growers know if and when the GM sweet corn needs additional protection. We are working on these thresholds, but we'll leave that discussion for another time.

T. Jude Boucher, University of Connecticut Cooperative Extension System

SUMMARY OF THE INTERNATIONAL POTATO COMMON SCAB CONFERENCE

I traveled to Guelph, Ontario, Canada in early March 2007 to attend the International Potato Common Scab Conference. This was an excellent conference, organized by Dr. Eugenia Banks, with speakers from Australia, South Africa, Scotland, United States, and Canada. Attendees included potato growers, researchers, consultants, and industry representatives. A common theme of presenters was the difficulty that farmers have all around the world in dealing with this problem. There is no one silver bullet approach to reducing or eliminating common scab—if there was, then there would not be a need for so many people to travel so far to discuss and learn about the issue. I will try in this summary to tell you about some of the strategies that seem to work as well as some that don't.

It was reported that a survey of Canadian potato growers rated common scab of potato as their third priority disease of concern—with late blight first and bacterial ring rot second. With late blight everybody knows they can get it but we also know pretty well how to monitor for it and manage it. Not many growers see ring rot now—but everyone fears it. It is a good example of a disease that has been greatly reduced by sanitation and good management. Common scab is a disease of concern because it is poorly understood and seldom "managed". Ask five folks like me how to manage common scab and you will probably get six answers! What works in one field may not work in an adjacent field on the same farm. There is no one factor that consistently works in your town, or Maine, or North America, or the world.

Common scab of potatoes is caused by several species of the genus *Streptomyces*. The most common species is *S. scabies* but there are other species that cause the problem. These species that cause common potato scab exist in all agricultural soils of the world and are also found in forest soils and other non-agricultural areas. It needs to be noted that there are thousands of species of *Streptomyces* and that there may be as many as two hundred species present in any one field. Many of the antibiotics used today are derived from various *Streptomyces* species. *Streptomyces* spp. are filamentous spore and toxin producing bacteria. The toxin that causes the common scab symptoms that many of us are all too familiar with is called thaxtomin. It disrupts the development of cell walls and results in scab lesions. The balance of *Streptomyces* spp. in a soil may be such that the scab causing species are suppressed. Factors that disrupt this balance may cause a field that never produced scabby potatoes to suddenly produce potatoes with so much scab that the field may be abandoned to potato production. The opposite has happened as well. Examples cited were two mid-western U.S. university sites that were used repeatedly to screen potato varieties for scab resistance. The crop of scabby potatoes was turned back into the soil every year. Then a year came that, surprisingly, there was virtually no common scab present on even highly susceptible varieties. In both cases these soils had become scab suppressive and remained so. Soils that are compacted, have poor soil structure, and are low in organic matter tend to have a higher incidence of scab. Some of the practices described later may work largely due to the improvements that they make to soil quality and soil health.

Practices that reduce the incidence of common potato scab are numerous. These include the use of resistant varieties, crop rotations with various cover crops, and certain nutrient and fertility practices, and fumigation. No one of these generally work alone, but a holistic approach that incorporates several of them is probably the best way to manage common scab. I will attempt to explain in a bit more detail each of these management tools.

Resistant variety development is probably the area of most benefit for growers with persistent problems with common scab. There was an excellent display of over one hundred potato cultivars at the conference. They ranged from highly resistant to highly susceptible and were rated on a scale of 0 (resistant) to 5 (susceptible). Even highly resistant varieties like Russet Burbank can get common scab though. Some of the Australian work is to find and develop strains of Russet Burbank that are even more highly resistant to the problem.

A couple of our presenters at the conference talked about their work with crop rotations and the use of various cover crops. A common theme was that brassica crops or brassica cover crops (mustard, canola, rape, broccoli) prior to potatoes tended to reduce the incidence of common scab more so than other materials. Sorghum X Sudan looked pretty good too. They probably "work" for different reasons though. The brassicas work as a result of the biofumigant activity of the breakdown of the crop—many of us have heard Peter Sexton talk about this at the winter potato seminars in Caribou. The sorghum X sudan produces a lot of sugars and other components that are readily digested by soil microbes thus feeding the good species to the detriment of the "bad" species of *Streptomyces*. Rye, both winter rye and annual rye, did not work to suppress common scab.

The nutrient and fertility discussion was of particular interest to me, as that is an area that I do a lot of work with. There was a lot of science presented as to why the following suggestions work and I am not going to go into those details here, but instead cut to the chase and tell you what has been observed to be useful in reducing common scab. Lime spreading got a bad rap by several presenters, to the chagrin of my friend Glen Swallow of Brookville Lime who was present at the conference. Adequate lime spreading to provide calcium and magnesium nutrition is important but high levels of lime spreading just prior to potatoes may cause some short term soil chemistry changes that can result in increased scab incidence. Remember, scab is a result of cell wall disruption, so adequate calcium to build strong cell walls may be helpful. Gypsum can also be used to provide calcium nutrition. There were several nutrient and fertilizer messages that I think may be useful for some growers. Have adequate soluble phosphorous in your fertilizer. Foliar applied phosphorous in one trial reduced scab by 20%. Use an

ammonium source of nitrogen. Have adequate magnesium. Do not have excessive potassium. The ratio of potassium to magnesium percents of base saturation should be less than .5 and a range of .3-.4 seems to provide both increased yield and scab reduction. This was from A & L Labs information. Adequate manganese is important as well. The speaker indicated that high carbon residues (small grain straw or corn stover) can bind up manganese in the short term and this micronutrient may need to be considered for inclusion in the fertilizer material.

The work with fumigation in Michigan generated the most questions and discussion (quest for a silver bullet?). A banded application of chloropicrin in the fall or spring prior to planting dramatically reduced the incidence of common scab and resulted in some good yield increases as well. Similar results came out of Ontario research. There are some management challenges to fumigation. Soil temperatures need to be over fifty degrees Fahrenheit and potatoes can not be planted for about two weeks after a spring application. Potatoes need to planted over the treated band with minimal disturbance to the treated soil. Fumigation with Vapam (metam sodium) does not control scab, so not all fumigation products work on all soil organisms.

Of course there are lots of other things that don't work. We fondly refer to many of these items here as "Snake Oil" products. The speaker from Scotland told me that their term for similar materials is "Muck Abouts". Most growers have tried one or more of these types of products in the quest for something, anything, that may help to control common scab. I know this to be so because I have sold and/or recommended some of these materials in an earlier phase of my career! Several of our speakers at the conference told about products in this category that they have trialed in their work. Most did not work and some produced more scab than the untreated control. Try to remember the old adage, "If it sounds too good to be true….." This is especially true for this complex, difficult to manage disease common scab of potato.

Lauchlin W. Titus, CPAg

VEGETABLE & FRUIT INSECTICIDE UPDATE FOR 2006/2007

New products:

• Beleaf 50SG 2F (flonicamid): controls aphids and tarnished plant bug on head & stem brassicas, mustard greens, cucurbits, fruiting & leafy vegetables, potato, pome & stone fruit. Made by FMC. Registered Nov. 2006.

New generic products:

• Alias 2F (from MANA/Makhteshim), Couraze 2F (from Cheminova), Agrisolutions Advise 2FL (from Agriliance), Agristar Macho 2FL (from Albaugh), Nuprid 2F (from Nufarm), and Imida E-AG 2F (from Etigra) have the same active ingredient (imidacloprid) as Admire 2F (from Bayer).

• Pasada 1.6F (MANA/Makhteshim), Couraze 1.6F (Cheminova), Prey 1.6 (UAP/Loveland), Agristar Impulse 1.6F (Albaugh), Nuprid 1.6F (Nufarm), and Imida E-AG 1.6F (Etigra) have the same active ingredient (imidacloprid) as Provado 1.6F (Bayer).

• Pasada 75WSB and Couraze Solupak 75WP have the same active ingredient (imidacloprid) as Provado 75WSB.

New formulations:

• Assail 30SG: replaces 70WP and 70WSP. Made by Cerexagri.

• Venom 70SG replaces Venom 20SG. Made by Valent.

• Baythroid XL 1EC (beta-cyfluthrin): replaces Baythroid 2E (cyfluthrin); rates of product per acre are unchanged. Made by Bayer.

Registration expanded to additional crops:

• Danitol 2.4EC (fenpropathrin): blueberry, peppers, eggplant, peas, greens. Label initially approved by EPA in Sept 2005 but final label not issued by manufacturer until Sept. 2006. Controls Japanese beetle, other beetles, caterpillars, maggots, stink bugs, spider mites, thrips.

• Entrust 72WP (spinosad): stone fruit, caneberries (May. 2006) for caterpillar control.

• Rimon 0.83EC (novaluron): apples and cabbage and other head and stem Brassica crops (April 2006); had been Ohio 24c registration for apples since Jan. 2005 and potatoes since 2003. An insect growth regulator that acts as a chitin inhibitor; kills caterpillars and suppresses thrips, whiteflies, plant bugs, and stink bugs. Made by Chemtura (formerly Crompton/Uniroyal).

• Proclaim 5SG (emamectin benzoate): pome fruit (April 2006). Controls leafrollers and leafminers; suppresses pear psylla, codling moth, mites.

• Lorsban 75WG (chlorpyrifos): Supplemental label for control of trunk borers in apple (April 2006); 28 day PHI.

• SpinTor 2SC (spinosad): Supplemental label for onion and other bulb veg (March 2006) for suppression of thrips.

• Baythroid 2E (cyfluthrin): leafy vegetables, eggplant, cucurbits, pome fruit, stone fruit, grapes (Nov. 2005). Broad spectrum; controls leafhoppers, caterpillars, bugs, beetles, thrips, leafminers.

• Assail 30SG (acetamiprid): potato and other tuber/corm crops (July 2005) for control of aphids, leafhoppers, beetles, and eggs of European corn borer.

Modifications:

• Lannate LV (methomyl): rate modified for fall armyworm, beet armyworm on many veg crops, plus new information about chemigation and resistance management (May 2006).

• Venom 70SG (dinotefuran): Additional pests added: stink bugs, squash bug, harlequin bug, cucumber beetles, grasshoppers on vegetables, and multicolored Asian lady beetle on grapes (April 2006).

• Imidan 70WP (phosmet): new limits per year, and re-entry interval lengthened (now 3 days for apple, pear, peach, 5 days for potato, 14 days for grapes; still 24 hours for blueberry); Jan. 2006.

• Lorsban 75WG (chlorpyrifos): on apples, use now allowed at petal-fall (spring 2006).

• Guthion (azinphosmethyl): divested by Bayer, acquired by MANA/Makhteshim (March 2007).

Cancellations:

• Dimethoate: cancelled on apple, grape, cabbage, collards, spinach, head lettuce (March 2006).

• Guthion 50WP: use not allowed after 30 Sept. 2006 on raspberries, blackberries, peaches, potatoes.

• Pending cancellation of Furadan 4F on all crops, but decision not final.

Other pest management items:

• Resistance to pyrethroids is developing in populations of corn earworm (tomato fruitworm). Alternatives for sweet corn are growing Attribute transgenic BT hybrids, or spraying Larvin, SpinTor, or Lannate, or tank mix of pyrethroid plus Larvin, or Lannate; for tomatoes, spray Avaunt, Proclaim, Intrepid, or SpinTor.

• Mode of action: The label front page of new insecticide products is now showing a code number for the mode of action group, based on a list by the Insecticide Resistance Action Committee (IRAC). To avoid resistance, rotate among products from different mode of action groups.

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