

Missouri Produce Growers Bulletin

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Selecting insecticides or miticides with less impact to honeybees for use in Cucurbit cropsby Jaime Pinero

Insecticides are used to get rid of unwanted insects. Unfortunately, honey bees and most other beneficial insects or mites are greatly affected by insecticides. There are several ways honey bees (and other bees) can be killed by insecticides. One is direct contact of the insecticide on the bee while it is foraging in the field. The bee immediately dies and does not return to the hive. In this case the queen, brood and nurse bees are not contaminat-

ed and the colony survives. The second more deadly way is when the bee comes in contact with an insecticide and transports it back to the colony, either as contaminated pollen or nectar or on its body. This article discusses the relative toxicity of insecticides to honey bees and other beneficial insects with a focus on products listed for cucurbits in the 2012 Midwest Vegetable Production Guide given the high need for these crops to get

sufficient pollination services.

Cucurbits have the male and female flower parts in separate flowers (yet still on the same plant) and therefore insects are needed to transfer pollen from male flowers to female flowers while collecting nectar and pollen. In general terms, the more bee visits per flower, the greater the number of seeds per fruit, the larger the size of the fruit, and the fewer number of misshapen fruit.

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Food Safety Modernization Act treads waterby James Quinn

The US Food and Drug Administration (FDA) was expected to release a 'draft rule' on the new food safety rule in January. That has NOT happened and many growers are wondering what is the hold up.

The FDA's deputy commissioner for food, Michael Taylor commented on this back in April. To the Food Safety News he stated the reason for the delay as "simply due to the 'logistical challenge' of the volume of rule-making called for by the new food safety law". Once the draft rule is released, there is a comment period, which was to be 60 days. That time period is being doubled to 120 days. A

longer comment period was requested by a grower group, but the reason given for the extension by the FDA was the length of the rule.

Behind the official statement it is unclear if the hold up is due to the presidential campaign. New regulations has been cited as hindering the economic recovery. There are four 'rules' that make up the Food Safety Modernization Act. In addition to the 'produce safety rule' are preventative controls for food facilities, foreign supplier verification, and preventative controls for animal feed facilities. The four rules have been pending under

review by the Executive Office of Management and Budget's (OMB's) Office of Information and Regulatory Affairs for the past 6 to 7 months. OMB is a unit of the White House.

Once the rule is released, at least 3 public meetings in diverse geographical areas of the United States will be held to give individuals and groups an opportunity to comment. Additional opportunities may be provided and they can be found under the FDA's *Meetings, Hearings, and Workshops* website as they are scheduled. They will be announced by this newsletter if sufficient advance notice is possible.

Pesticides and honeybees (continued)by Jaime Pinero



Jaime Pinero poses with a Japanese beetle trap. He is conducting research on how to control this pest organically, including mass trapping. Yes that long black bag is full of beetles! Japanese beetles have been problematic on some fruit crops and ornamentals, but vegetables have been mostly spared. Occasionally they feed on green beans and okra. They will eat the silks off of corn.

The 2012 Production Guide lists 29 different insecticide/miticide products that can be used in **cu-curbit** crops (squash, pumpkins, melons, cucumbers, etc.). Of these, 8 insecticides are reduced-risk products and 2 can be used in organic production. Cornell University developed a method to estimate how toxic insecticides are to fish, birds, bees, and other beneficials, combined. This method yields a single value that for the purposes of this article can be called Ecological Impact Value (EIV). In brief, it is calculated taking into account the inherent toxicity of the chemical, the % active ingredient in formulation, the rate at which is being used (for the calculations the high rate was used), and the number of applications. The table below provides the ranking of insecticides listed in the 2012 Midwest Production Guide for cucurbit crops, from the **most toxic (higher EIV)** to the **least toxic (lower EIV)** to bees and

other beneficials. The top 10 most toxic materials are highlighted in red. Check the 2012 Production Guide for specific uses (crops, pests) of the materials listed below.

In addition to the above data, the following recommendations can minimize the risk of inadvertently killing bees and other beneficial insects:

- **Use less toxic, rapidly degradable pesticides** – The table above can help you select effective yet the least toxic (to non-target organisms) insecticides
- **Choose the appropriate formulation-** The appropriate choice of formulation is another way to avoid honey bee pesticide kills. Pesticides come in different formulations: dusts (D), wettable powders (WP), soluble powders (SP), emulsifiable concentrates (EC), solutions (LS), and granulars (G).
- If at all possible **do not spray blooms** directly with pesticides. If the bloom needs to be sprayed, apply the pesticides in the evening hours.

Editor's note:
The Midwest Vegetable Production Guide for Commercial Growers also addresses this topic. For the 2012 edition it starts on page 25 and provides a list of pesticides and their toxicity on page 26. The scale provided in this article is easier to use. Look for more information on this topic in upcoming newsletters.

Active ingredient	Chemical class	Trade names	Ecological Impact Value	Notes
<i>Cryolite</i>	<i>Not determined</i>	<i>Prokil, Kryocide</i>	<i>650.8</i>	
<i>Endosulfan</i>	<i>Organochlorine</i>	<i>Endosulfan</i>	<i>79.5</i>	<i>Not to be used after July 31</i>
<i>Malathion</i>	<i>Organophosphate</i>	<i>Malathion</i>	<i>65.0</i>	
<i>Difocol</i>	<i>Organochlorine</i>	<i>Kelthane</i>	<i>46.7</i>	
<i>Carbaryl</i>	<i>Carbamate</i>	<i>Sevin</i>	<i>44.5</i>	
<i>Methomyl</i>	<i>Carbamate</i>	<i>Lannate</i>	<i>44.1</i>	<i>Restricted-Use Pesticide</i>
<i>Bifentazate</i>	<i>Carbazate</i>	<i>Acramite</i>	<i>37.5</i>	<i>Reduced-Risk</i>
<i>Dimethoate</i>	<i>Organophosphate</i>	<i>Dimethoate</i>	<i>34.2</i>	
<i>Imidacloprid</i>	<i>Neonicotinoid</i>	<i>Admire</i>	<i>26.1</i>	
<i>Fenprothrin</i>	<i>Pyrethroid</i>	<i>Danitol</i>	<i>21.0</i>	<i>Restricted-Use Pesticide</i>
Permethrin	Pyrethroid	Ambush, Pounce	14.2	Restricted-Use Pesticides
Thiamethoxam	Neonicotinoid	Actara, Platinum	11.5	Both are Reduced-Risk
Bifenthrin	Pyrethroid	Brigade, Capture	11.2	Restricted-Use Pesticides
Spiromesifen	Tetronic acid derivative	Oberon	9.1	Reduced-Risk
Acetamiprid	Neonicotinoid	Assail	7.2	Reduced-Risk
Esfenvalerate	Pyrethroid	Asana XL	5.5	Restricted-Use Pesticide
Spinetoram	Unclassified	Radiant	5.4	Reduced-Risk
Spinosad	Spinosyns	Entrust	4.4	Organic
Spinosad	Spinosyns	SpinTor	4	Reduced-Risk
Cyhalothrin	Pyrethroid	Warrior	2.6	Restricted-Use Pesticide
Pymetrozine	Triazine	Fulfill	2.4	Reduced-Risk
Cyfluthrin	Pyrethroid	Baythroid	2.4	Restricted-Use Pesticide
Cypermethrin	Pyrethroid	Mustang MAX	2.1	
Abamectin	Avermectins	Agri-Mek	1.7	
Azadirachtin	Insect growth regulator	Neemix	0.6	

Bacterial Speck of Tomato...by Dave Trinklein

Since a number of cases of bacterial speck have been confirmed in Missouri this spring it would be good to review the management of this troublesome disease of tomato. Bacterial speck along with bacterial spot are diseases with the potential to cause significant crop loss. Although caused by different microbes, bacterial speck and bacterial spot are nearly identical in their epidemiology, symptoms and management. This article will address bacterial speck which seems to be the more prevalent of the two in Missouri this spring.

Bacterial speck is caused by the bacterium *Pseudomonas syringae* pv. *tomato*. Symptoms of the disease appears as dark brown to black lesions of various sizes and shapes on leaves, fruit, and stems. Chlorotic (yellowish) tissue surrounding leaf lesions is common. Lesions frequently are observed near leaf margins, causing (eventually) marginal necrosis. Lesions on immature fruit are slightly raised and small, varying in size from tiny flecks that develop into raised black spots on mature fruit. The fact that lesions appear on tomato fruit adds to the disease's potential to cause economic loss. Although seldom more than a few cells deep, fruit lesions often render the fruit unsalable.

The pathogen responsible for bacterial speck thrives in cool, moist environmental conditions. This is a primary reason why the disease usually is most severe on early plantings. The disease will develop rapidly at 75°F. However, it can develop at temperatures as cool as 63°F. At 89°F pathogen populations do not develop to the point that typical symptoms are evident. The pathogen is spread via contaminated seed, mechanically (e.g. working

with plants, especially when the foliage is wet) and by "driving" rains.

There is a direct correlation between the amount of time tomato leaves remain wet and the likelihood that populations of the pathogen will build to levels sufficient for the production of visible symptoms. If leaves remain wet for at least six hours bacterial speck development is promoted in most instances when temperatures are conducive for infection.

Once established in a planting, the control of bacterial speck is difficult. Therefore, an IPM approach to the management of the disease is recommended. This begins with the use of disease-free transplants as a method of preventing the disease. Growers producing their own transplants should be certain seeds they use are known to be free of pathogenic bacteria. Additional methods of cultural control include crop rotation and strict sanitation. Rotate tomato plantings with crops other than tomato and pepper to avoid carryover of bacteria from year to year. The control of weeds also is important in areas to be planted to tomatoes the following year. Horse nettle and other weeds that are members of the *Solanaceae* (Nightshade) family can act as hosts of the pathogen that causes bacterial speck. Always remove and destroy diseased plant debris or incorporate it into soil soon after harvest is completed.

It is important to note that this disease is caused by a bacterium and not a fungus. Unfortunately, there are very few pesticides that are effective against bacterial diseases. Fixed copper compounds (e.g.

Kocide®) applied during cool, rainy weather at 10 to 14 day intervals is helpful. Remember, copper acts as a protectant and does not cure an established disease population. Therefore it must be applied before conditions become conducive for infection to be effective. The use of mancozeb products (e.g., Dithane®) as a tank mix with fixed copper compounds may allow more copper to become available on the leaf surface, thus making it more effective, especially in cases where resistance to copper has been observed.

Tanos®, a relatively new, broad-spectrum fungicide, has been shown to suppress bacterial speck while at the same time controlling other problematic foliar diseases of tomato. Additionally, Actigard® and Serenade® MAX are both labeled for bacterial speck suppression on tomato. It is speculated that Actigard® may help to lessen the symptoms of bacterial speck by inducing the plant to increase its resistance to disease. Serenade® MAX is a biological product with organic clearance derived from a strain of the bacterium *Bacillus subtilis*. It often used in conjunction with copper compounds in the battle against bacterial speck.

Finally, bacterial speck and spot are not inevitabilities in the production of tomatoes. They do, however, represent diseases that can result in significant loss should they occur and due vigilance is appropriate. Growers with a history of these diseases on their tomatoes especially must be watchful and take appropriate measures to control them.

Disease and diagnostic updateby Tim Baker and James Quinn

Tomato bacterial canker was a problem in 4 areas of Missouri last year. We believe it originated with Scarlet Red seed of the 2010 seed increase year (sold in spring of '11). Once in a production region it can reoccur, which it has in two areas from last year- North and Central Missouri. It's been found in greenhouses and high tunnels.

It sometimes causes fruit damage, but affects a great deal of the foliage and can eventually kill the entire plant. Leaf margins get a scorched black look. Good photos and a description are in the Penn State Vegetable Disease Booklet. There is no treatment/'cure'. Strict hygiene and good cultural practices are about the only control. Last year we distribut-

ed a Rutgers University fact sheet on the disease. Contact an Extension Specialist if you think you have the disease. We want to understand how extensive it is again this year.

Herbicide contamination in soil (or compost) has caused a problem in north Missouri for a third year in a row. In 2010 and 2011 it was traced to the herbicide Grazon®, It is a mix of two active ingredients (picloram and 2,4-D). While 2,4-D is notorious for drifting or volatilizing and moving off site, picloram is a serious risk for soil contamination. This herbicide is applied to pastures and the label clearly says to never move any soil from where it was applied for growing food crops.

Growers who have done so did this accidentally, but that doesn't make the problem any less or go away. The product can also be carried over into the manure of cattle or buffalo feeding on pasture where it has been applied. In 2011 it showed up in compost which had manure as a component. Again the label clearly provides a warning- "Do not use manure from animals grazing treated areas of land or feeding on hay from those areas, for growing broadleaf crops, ornamentals, orchards or other susceptible desirable plants. Manure may contain enough picloram to cause injury to susceptible plants."

Tomatoes are VERY susceptible!
Know the source of your soil or manure.

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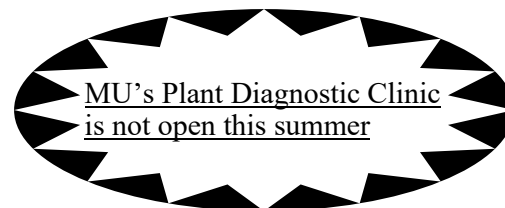
We'd like to thank the following agency for their financial assistance with our outreach activities, such as this newsletter and travel costs associated with educational activities.

EPA Region 7 Strategic Agricultural Initiative
901 N. 5th Street Kansas City, KS 66101
913-551-7003 or 800-223-0425

About this mailing list

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Produce auctions increase to nine in Missouri

By James Quinn, Heather Benedict, and Bob Schultheis

Two produce auctions have opened in Missouri this year with regular hours and auction dates. And two started last year (Barton County Produce Auction and Leadmine Produce Auction, which is just south of the Lake of the Ozarks in Hickory County). So in just two years Missouri produce auctions have increased from 5 to 9. Here is the basic information about the two new auctions.

The **Highway 60 Produce Auction** replaces the "occasional" one that ran last year. This one caters to the A Highway Amish in Webster County (county seat is Seymour), but is open to all growers. It is about 7 miles away from the C Highway Produce Auction (which opened in 2008).

Highway 60 Produce Auction

When: The auctions are held Tuesdays and Fridays in June, July, August, September and October. Auction start time is 10 a.m.

Where: Located on the north side of Highway 60 halfway between Diggins, MO and Seymour, MO. The 40 ft. x 60 ft. building enclosed on three sides (open to the south) is adjacent to the Tool Store.

Contact:

Kelly and Sarah Iler
35 Killdeer Rd, P.O. Box 339
Seymour, MO 65746
417-935-2791 (store) or
417-761-9535 (Kelly - cell) or
417-880-1283 (Sarah - cell)
Email: hwy60produceauction@gmail.com

The Eagleville Produce Auction

started on Tuesday April 16th. The operator of this auction is 'English' and is encouraging growers to follow GAP

regulations. They have a web site and post market reports after each auction.

When: The auctions are held Tue/Th schedule until mid-July. It then goes to a M/W/F schedule through August, and then back to a Tu/Th schedule for September until the end of October.

Auction start time is 10 a.m.

Where:

1/4 mile west of exit 106 of I-35

Contact:

Owner & Manager:
Mick Parkhurst
Manager: Cheryl Mossburg
660-867-3211
16024 Locust
Eagleville, MO 6442
Web site-
www.Eaglevilleproduceauction.com

This location is about 15 miles from the Farmsong Produce Auction of Lamoni, Iowa. The Farmsong Produce Auction opened in 2009 and is operating under the same schedule as last year.