Pest e-alerts

Entomology and Plant Pathology, Oklahoma State University
127 Noble Research Center, Stillwater, OK74078
405.744.5527

Vol. 14, No. 12 http://entoplp.okstate.edu/Pddl/ **Apr 3, 2015**

Scouting for and Managing Diamondback Moth in Canola

Tom Royer, Extension Entomologist

Josh Bushong, OSU Extension canola production specialist and Heath Sanders canola specialist for Great Plains Canola Association have been seeing some diamondback moth (DBM) infestations and want to know about DBM management as our canola begins to bolt. Josh asked about DBM infestations at bolting through pod fill. Heath wanted to know more about using pheromone traps for monitoring and decision making.

Photo courtesy of Alton Sparks Jr., University of Georgia. Bugwood.org

Diamondback moth is a small, gray and brown moth that measures ½ inches. When resting, the wings are folded over the body in a roof like position. Male moths have three diamond-shaped markings on the forewings when they are folded together, which is how it got its name (left). Female moths lay oval flattened eggs measuring 0.44 mm in groups of 1-8 eggs which will hatch in 5-6 days. One female will lay an average of 150 eggs.

Newly hatched larvae are light green with a green head, and become progressively darker as they mature. They develop through four instars. A full grown DBM caterpillar measures about ½ inches long. One distinct feature of this caterpillar is that they will thrash violently back and forth and drop from the plant on a silk strand when disturbed. They pupate in a loose, silken cocoon that they attach to the plant. They can complete a lifecycle in about 32 days, depending on temperature. Typically a scout will find all life stages at the same time within a field.

Larvae are the damaging stage. Newly hatched larvae feed by leaf mining. As they grow they feed on the outside of the leaves. Small larvae chew small irregular windowpane areas on a leaf (right) but as they get larger, they chew entire leaves leaving only the veins. Although leaf feeding looks bad, it doesn't result in notable yield loss. However, significant yield loss is associated with flower and seed pod injury. Larvae feeding in flowers cause them to abort and seed pod feeding reduces seed production. Larval feeding on flowers and seed pods can also cause a delay in plant maturity.

Photo courtesy of Merle Shepard, G.R. Carne and P.A.C. Ooi. Bugwood.org

First, let me try to answer Josh's question about DBM management as our canola begins to bolt. Diamondback moth populations can cause problems in canola during bloom and pod fill if they reach damaging numbers. We have not consistently encountered spring infestations in Oklahoma, so we do we have not had ample opportunity to develop a research-based, local economic thresholds for managing them. However, our northern neighbors in North Dakota and the prairie provinces of Canada have a wealth of experience, and have developed some usable management recommendations for DBM based on a shake bucket method for scouting.

Scout for diamondback moth by pulling plants from a 1-square foot area, shake the collected plants into a white bucket and count larvae. Count larvae that are dangling on the plant from silk threads as well. Take counts in at least 5 locations to get an average number of larvae per square foot. Thresholds for DBM larva in canola are:

10-15 larvae per square foot during early flowering (1-2 per plant)
20-30 per foot during pod stage (2-3 per plant)

Now let me address Heath's question about using pheromone traps to monitor and make decisions about DBM populations. Pheromone traps are used in canola to monitor DBM first occurrence in spring, and to get an idea of population numbers. They are baited with a pheromone identical to that emitted by female DBM that are trying to attract male moths for mating. The best trap styles are wing or delta traps typically suspended 3-5 feet above ground at the field's edge. Trap bottoms are covered with a sticky substance that captures any moths the fly into the trap. Pheromone traps are available from various sources, such as:

Trécé Inc. http://www.trece.com/pherocon.html or
ISCA Technologies http://www.iscatech.com/exec/index.html

Pheromone traps DO NOT take the place of scouting but they can provide an early-warning of future infestations. Fields still need to be scouted for DBM larvae before making a decision to spray. If more than 100 moths are captured in a trap each week, it is possible that a significant infestation of larvae will occur within the next 1-2 weeks and fields need to be scouted with shake buckets.

One final caution: Diamondback moths are notorious for developing resistance to insecticides, particularly pyrethroids, which are the primary registered insecticides for use in canola. I am not aware of any control failures with pyrethroids that have occurred in Oklahoma, but to reduce the possibility of obtaining poor control, I suggest that producers apply the high end suggested rate with as much water as possible to ensure thorough coverage and improve residual activity. Several alternative modes of action are available, including Prevathon™, which was recently registered for use in canola specifically for diamondback moth as well as other caterpillars. Current recommendations for control of diamondback moth in canola are listed in CR-7667, Management of Insect and Mite Pests in Canola which can be obtained online at http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-3045/CR-7667web2009.pdf

Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

2015 Pecan Nut Casebearer Monitoring Program

Jackie Lee, Extension Entomologist

Pecan nut casebearer (PNC) larvae can tunnel into nutlets shortly after pollination and potentially destroy all nutlets in a cluster. The most effective control method is a well-timed insecticide spray. The insecticide must be applied after egg hatch but before the larvae tunnel into the nutlets. Insecticides should only be applied if the nut load and infestation level warrants a treatment. Monitoring should begin in early May to prepare for PNC adult emergence which can occur anytime between early May and early June. Oklahoma State University has an in depth fact sheet on PNC monitoring, which can be found at the following link: http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-1314/EPP-7189web%20color.pdf.

If you plan on monitoring please think about participating in the PNC data collection program. This is a web-based data entry system hosted on the Pecan ipmPIPE. The program rationale is to provide real time PNC data entry from the field to drive a PNC risk assessment model that

will appear in a Belt-Wide map in real time to aid producers in making PNC management decisions in the current season. The public map page can also be used to view the results of previous seasons.

To take part as a cooperator in the PNC Data Collection Program of Pecan ipmPIPE:

1. Register online at http://pecan.ipmpipe.org/cooperator_programs/pnc/pidss.cfm as a member of Pecan ipmPIPE, preferably by May 15. You will be sent a unique passcode to your email with instructions to activate your account. If you registered in previous years this step is not necessary. If you have forgotten your password, you can retrieve it from the login page.

2. Log into the system. Your username/password is saved in a session unless you log out.

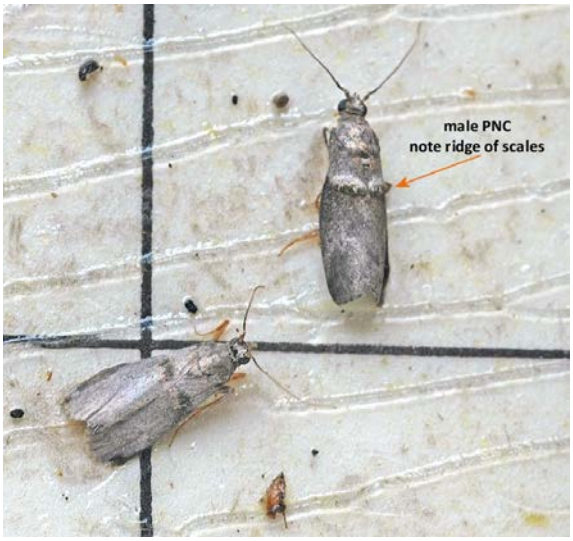
3. Request to be part of the program using the 'Become a Cooperator' link.

4. Begin Collecting and reporting data from your orchard.

Please note that free PNC traps/ lures are no longer available from the parent program. USDA funds have been expended. However, some local, regional and state coordinators of pecan IPM do include this. Please contact your local Pecan IPM agent to check availability (Jackie Lee, jackie.lee@okstate.edu).

Collecting PNC data:

PNC pheromone traps should be placed in the field and inspected at least 10 days before first moth catch is expected (early to mid-May). This allows firm establishment of the baseline to determine when moths first begin emerging because "zero" moths in the traps provide strong evidence that the PNC is still in the pupal stage and the flight has not yet begun. Then, the first moths (that are found in the traps after the "zero" catch dates are recorded) are known to also be the first moths that are emerging in the flight. The regular tracking of this flight during the few weeks that moths are active provides an accurate picture of how that generation interacted with the pecan crop.



Data entry forms are accessed by logging into the website and selecting the 'enter data' menu item. (http://pecan.ipmpipe.org/cooperator_programs/pnc/pidss.cfm)

The ideal reporting schedule is daily, and if it is convenient for you to do so, we would like to receive daily information. Alternatively, trap checking and reporting schedules of three (i.e. MWF) or even two (i.e. Monday and Thursday) times per week are of value to us.

Regular online reporting of the PNC moth catch data is essential to allow us to produce the real-time PNC Risk Map. Additional data on egg lay, hatch, nut entry, % infestation of nuts by larvae, crop load, etc. is not essential, but very useful for model validation and management evaluation. We would appreciate your recording this as well on the forms provided. Consult the website or contact us if information is needed on how to do this. Such information will assist us in expanding our knowledge about PNC activity and help us serve you better. Participation can also be through your state/local PNC expert. The belt-wide program is designed to facilitate and not replace local expertise. Contact your local Pecan IPM expert (Jackie Lee) as needed.

PNC Pheromone and Trap Suppliers are Listed Below

Advanced Pheromone Technologies, Inc.
P.O. Box 417
Marylhurst, OR 97036-0417
Ph: 315-299-2598
toll free: 877-244-9610
fax: 971-327-8407
email: infoatapt@comcast.net

Gempler's
P.O. Box 270
100 Countryside Drive
Belleville, WI 53508
Order by Phone: 1-800-382-8473
Order by Fax: 1-800-551-1128

Great Lakes IPM Inc.
10220 Church Road
Vestaburg, MI 48891-9746
Ph: 989-268-5693 or 989-268-5911
Toll Free: 1-800-235-0285
Fax: 989-268-5693
E-mail: glipm@nethawk.com

ISCA Technologies / Moritor Technologies
P.O. Box 5266
Riverside, California 92517
United States of America
Tel: 951-686-5008
Fax: 815-346-1722

email: info@iscatech.com
Web: http://www.iscatech.com

Trece, Inc.
P.O. Box 129
Adair, OK 74330
Ph: 918-785-3061
Order Center 866-785-1313
Fax: 918-785-3063
Email: custserv@trece.com
Web: http://www.trece.com

2015 Spotted Wing Drosophila Monitoring Program

Jackie Lee & Eric Rebek, Extension Entomologists

Last field season (May-August 2014), OSU monitored for spotted wing drosophila and found this pest in every location where traps were set (4 counties, refer to map at web address below). Due to the information we gathered last field season, SWD is more than likely widespread in the state of Oklahoma and can pose a significant threat to fruit crops in our state. The female lays eggs in ripe fruit that is still intact, on the vine, bush, or tree. The larvae feed in the fruit and can cause: sour rot, fruit collapse, and unmarketable fruit due to larval infestations. We found that SWD populations increase throughout the harvest season. We need to be diligent about monitoring for this pest in fruit crops including: blueberry, blackberry, raspberry, strawberry, grapes, and other soft skinned fruits. It is best to start monitoring a few weeks before fruit ripens. Below is a good outline for monitoring and managing SWD. If you suspect you have found SWD, drop specimens off at your local extension office or send to the OSU Plant Disease and Insect Diagnostic Laboratory: OSU Insect Diagnostic Lab, Entomology and Plant Pathology, 127 Noble Research Center, Stillwater, OK 74078. Stay informed! For updated map of SWD in OK and other info visit: http://entoplp.okstate.edu/swd/index.html.

2015 SWD Monitoring Program

1. Place 2 traps at fruit level and check traps through harvest. Traps can be made by drilling small holes around the edge of a red solo cup or clear deli cup (Figure 1). Make sure you add a lid or large insects will get into your trap.
    a. Can be placed on the edge or center

b. If over 5 acres, place 2-3 additional traps

2. Fill traps with bait (150 ml, ½ to ¾ of a cup). Use one of the below recipes.
    a. Okay: Apple cider vinegar + a drop of unscented dish soap
    b. Better: Apple cider vinegar (120 ml or ½ cup) + wine (80 ml or ¼ cup) + drop of unscented dish soap.
    c. Best: 12oz (1 ½ cups) of water + 1 TBSP Apple cider vinegar + 4 TBSP sugar + 1 TBSP yeast + 2 TBSP whole wheat flour
        i. Add 2oz of this solution to a small secondary cup (Figure 1). Place this cup in your trap. Pour apple cider vinegar into larger trap to act as a drowning solution.
    d. Best: SWD lure. This lure is manufactured by Trece http://www.trece.com/PDF/Pherocon_SWD_flyer.pdf. Place it suspended from the top of your trap. Pour ACV in bottom of trap for a drowning solution. Place a drop of unscented dish soap in the drowning solution. Change lure every 2 weeks.

3. Check traps and change bait solution weekly.

4. To check traps, pour trap liquid through cheesecloth or a strainer over a container to catch the old liquid and strain out the insects (Figure 2).
    a. Use forceps to organize flies into like sizes on the cloth. There will be many types of flies. Baits are not specific for SWD.
    b. Use hand lens (20x) to identify suspect flies. There is a great guide for identification: http://www.ipm.msu.edu/uploads/files/SWD/MSU_SWD_and_Imitators_identification_sheet-6-13-2013.pdf
    c. Collect SWD suspects with forceps and place in small vial filled with apple cider vinegar.
    d. Drop specimens off at local extension office or send to Plant Disease and Insect Diagnostic Laboratory: OSU Insect Diagnostic Lab, Entomology and Plant Pathology, 127 Noble Research Center, Stillwater, OK 74078
    e. DO NOT DISCARD OLD BAIT SOLUTION IN FIELD

5. If SWD is found and fruit are ripening, apply a registered insecticide weekly (re-apply after any significant rainfall) and rotate the mode of action (IRAC #) (Table 1).

6. Evaluate effectiveness and fruit infestation levels by looking for larvae in the fruit.
    a. Weekly, pick fruit off the plant (at least 30 fruit samples from throughout the field) and use one of the below methods.
        i. Fruit flotation method (Figure 3): 1 quart of water + ¼ cup salt. Crush fruit slightly and add fruit to the liquid and let set for 15 minutes. You may need to place a wire mesh screen over the fruit to hold it underneath the liquid. Use a hand lens to examine the liquid for small white larvae.
        ii. Cut open and observe larvae (not very reliable).

iii. Place fruit in jars and see if adults emerge in 2 weeks. Can be messy!

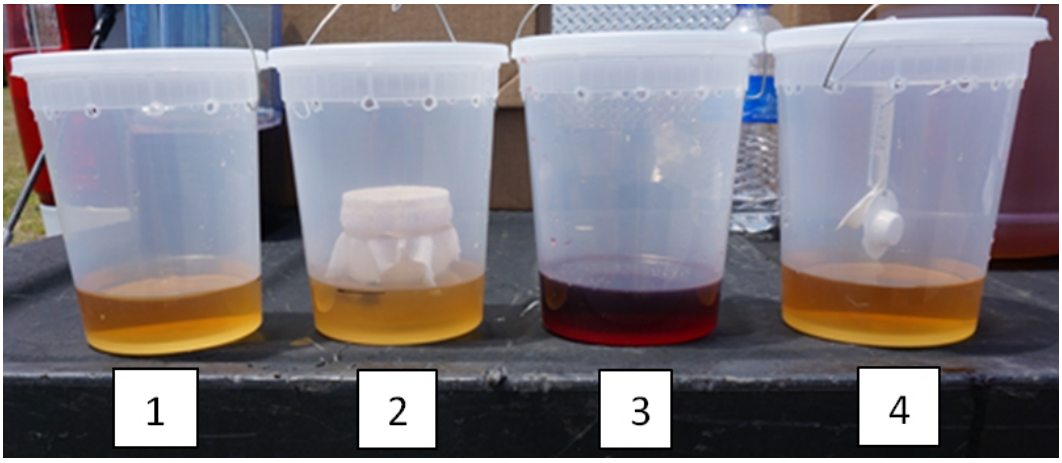


Fig 1. Traps used for monitoring SWD with four different bait solutions: 1. Apple cider vinegar (ACV), 2. Fermentation solution in secondary container with ACV drowning solution, 3. Wine solution, 4. SWD Lure with ACV drowning solution.

Fig 2. Use cloth to strain flies out of the liquid bait (B). Organize insects by size and shape (C). Use hand lens to identify SWD (D).

Fig 3. Fruit floation method for detecting larvae in ripe fruit. Fruit is collected and floated in a salt solution for 30 minutes and the larvae migrate into the solution (white arrows).

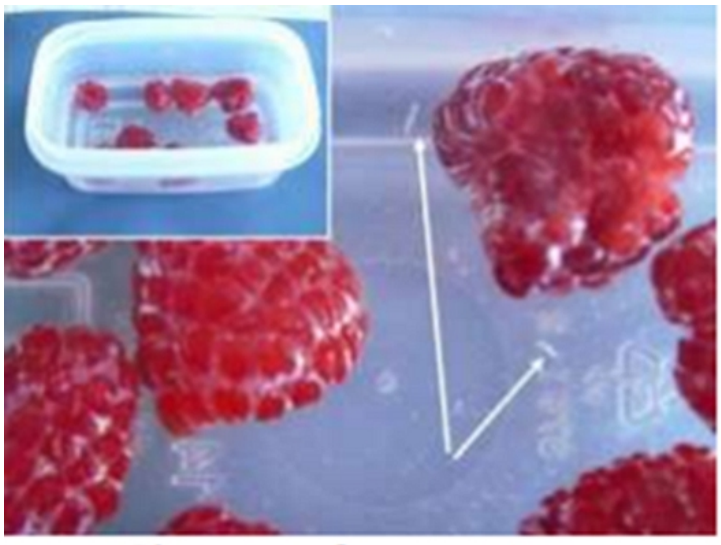


Table 1. Registered insecticides for SWD management. Note PHI (Pre-Harvest Interval) and rotate IRAC#. **Remember - always read and follow label directions.**

Active Ingredient	Trade name	IRAC #	Blueberry PHI	Caneberry PHI	Strawberry PHI	Grape PHI	Probable Efficacy
Methomyl	Lannate LV[1]	1A	3	Not labeled	Not labeled	Not labeled	Excellent
Phosmet	Imidan 70W	1B	3	Not labeled	Not labeled	7-14[3]	Excellent
Malathion	Malathion	1B	1	1	3	3	Excellent
Diazinon	Diazinon[1]	1B	7	7	5	Not labeled	
Bifenthrin	Brigade[1]	3	1	3	0	30	Excellent
Esfenvalerate	Asana[1]	3	14	7	Not labeled	Not labeled	Excellent
Fenpropathrin	Danitol[1]	3	3	3	2	21	Excellent
Zeta-cypermethrin	Mustang Max[1]	3	1	1	Not labeled	1	Excellent
Spinetoram	Radiant	5	Not labeled	Not labeled	1	Not labeled	Excellent
Spinetoram	Delegate	5	3	1	Not labeled	7	Excellent
Spinosad	Entrust[2]	5	3	1	1	7	Excellent
Cyazypur	Exirel	28	3	Not labeled	Not labeled	Not labeled	Excellent
Carbaryl	Sevin 80s	1A	7	7	7	7	Good
Pyrethrin	Pyganic[2]	3	0	0	0	0	Fair

[1]Indicates the product is a restricted use pesticide. Requires a pesticide applicators license for purchase and application.
[2] Organic insecticide
[3] Pre-Harvest Interval (PHI) is based on rate. Refer to label.

Wheat Disease Update

Bob Hunger, Extension Wheat Pathologist

Not much has changed around Stillwater and north central OK related to wheat foliar diseases. Around Stillwater I have seen slightly more powdery mildew but only down close to the ground on lower leaves and stems. There also are scattered pustules of leaf rust and stripe rust, but no large (or even medium or small) hot spots of either rust. Dr. Brett Carver (OSU Wheat Breeder) indicates similar observations from his nurseries located near Marshall (35 miles west of Stillwater) and Lahoma (10 miles west of Enid). Barley yellow dwarf spots are beginning to show up in a lot of the wheat around Stillwater, which is not surprising given the incidence of aphids we have seen; both bird cherry-oat and greenbug, with greenbug appearing to be slightly more common than BCOs. We are confirming this with ELISA. I have received reports of severe rust (both stripe and leaf) across southern/south-central OK). Mark Gregory (Area Extn Agron Specialist – Duncan, OK) indicated he had heard of people being pleased with the results of spraying fields for early stripe rust infection. Next week I'll travel across southern toward southwestern OK and will give a more complete report then.

Barley yellow dwarf spot in a wheat field (L), powdery mildew on wheat (R).

Mindy McNair (OSU Texas County Extension Ag Educator – Guymon, OK) has indicated the following regarding the Oklahoma panhandle. Thanks Mindy! "Our wheat in the panhandle has been covered in brown wheat mites and aphids. There have been some army worms towards the west but the talk is around the mites. There is some wheat streak mosaic as well. But unfortunately the high temperatures, insects and lack of water have greatly impacted our yields in the last week. Those that didn't spray for the bugs in March have had significant loss but those that did spray will not recoup their spray costs if it doesn't rain soon."

In the previous edition **(Vol. 14, No. 12 – Apr 1, 2015)** an author was inadvertently left off the article. Authors should have been Tom Royer, Extension Entomologist and Jackie Lee, Pesticide Education Coordinator. I apologize for this error. RG

Dr. Richard Grantham - Director, Plant Disease and Insect Diagnostic Laboratory

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural.