Integrated Pest & Crop Management

Potential Problems with Alfalfa Weevil

By Wayne Bailey

Alfalfa weevil larvae are present in many Southern Missouri alfalfa fields as eggs laid in late fall and early winter hatch and larvae emerge. The alfalfa weevil (*Hypera postica* Gyll.) is an introduced pest which arrived in Missouri during the mid-1960s. Adult weevils are light brown in color with a wide dark brown stripe running down the back. The adult beetles are approximately 3/16 inch in length and possess the typical snout-nose associated with the weevil family of beetles. One generation is produced annually with adult weevils overwintering and actively laying eggs when temperatures rise above 50OF for several consecutive days during these seasons. Alfalfa weevil larvae are green to lime green in color with a white stripe running the length of the back. The head capsule is black to dark brown in color.

This insect is the primary insect pest of alfalfa statewide, but especially in southern counties where two or more peaks of larvae may be produced depending on when eggs were laid during the previous fall, over the winter, or in early spring. Eggs may be deposited in stems of overwintering stubble or in the stems of actively growing alfalfa plants during early spring. Alfalfa weevil eggs develop and eventually hatch after accumulating about 300 degree day heat units based on 48OF. This means that infestations of alfalfa weevil larvae often occur first on south-facing slopes of alfalfa fields, because these slopes warm faster in spring. Once emerged, larvae grow through 4 worm stages or instars before spinning a pupal case around themselves. Within a few weeks larvae change into adult weevils and emerge during late spring. Emerging adults usually leave alfalfa fields for the summer to hide in cooler field border areas before reentering fields to lay eggs in the fall, winter, and spring seasons.

Alfalfa producers in the southern counties of Missouri should actively be scouting alfalfa fields at least weekly or even twice weekly to determine pest numbers and plant damage. Producer in Central and Northern counties should begin scouting for alfalfa weevil within the next 1-2 weeks and continue through removal of first cutting harvest. The first damage observed will be small feeding holes in alfalfa leaflets as they grow out of the terminals of plant stems. This minor foliage damage is caused by the 1st and possibly 2nd larval (worm) stages called instars. As larvae grow larger (3rd and 4th instars) they consume greater amounts of plant foliage and may cause severe economic loss.

Scouting for alfalfa weevil is accomplished by randomly collecting 50 alfalfa stems (10 stems at 5 different locations) and tapping them into a white bucket. Larvae will generally be dislodged by this action and allow for an average number of larvae per alfalfa stem to be calculated. Caution should be used when collecting stems as larvae can be easily dislodged from the growing tip of the plant stem by rough handling. It is recommended that the top of the alfalfa stem be cupped in one hand while the plant stem is removed by cutting with a knife near the base of the stem. If an average of one or more larvae per stem is found, then the economic threshold has been reached and control is justified.

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Management Options:

(1) The main management option for early infestations of alfalfa weevil larvae on small alfalfa is an application of a labeled insecticide when larvae reach or exceed threshold levels. If an insecticide application is selected, a list of insecticides recommended for alfalfa weevil control follows. Rates are given as amount of formulated product applied per acre.

(2) Early harvest of the alfalfa by either machine or livestock may be viable options for some producers in Missouri. If early harvest of alfalfa by machine is selected as a control strategy, then the crop is harvested approximately 7-10 prior to the normal plant growth stage of 1/10nth bloom. Data from Missouri indicate that alfalfa weevil larval numbers are reduced by about 98% with mechanical harvest and about 90% by cattle grazing in a management intensive grazing system. Producers using grazing as a control strategy must be aware of the bloat risk to cattle grazing green alfalfa and risk to the alfalfa stand due to trampling during wet conditions.

Scattered problems with Cowpea and Pea aphids in alfalfa have been reported from southwest Missouri. The Cowpea aphid (*Aphis craccivora*) is a very dark gray to black aphid which was first found in Missouri in the early 1990's. Cowpea aphids are the only black aphids inhabiting alfalfa in Missouri. Adult Cowpea aphids are relatively small in size, shiny black in color with dull white appendages, whereas nymphs (immature aphids) tend to have dark gray coloration. This insect tends to feed on the tips of alfalfa during early spring and can cause yellowing of plant leaflets from the bottom upward and possible stunting of plants. Although no formal economic thresholds for Cowpea aphid have been calculated from Missouri infestations, thresholds developed by the University of California – Davis suggest thresholds of 10 - 12 or more aphids on stems of alfalfa plants 10-inches or less in height and 20 - 40 or more aphids on the stems of alfalfa greater than 10-inches in height justify treatment. Missouri thresholds for pea aphids (*Acyrthosiphon pisum*) in alfalfa indicate than an average of 50 or more pea aphids per alfalfa plant may justify treatment of the pest population on plants up to 20-inches in height and 100 or more aphids on plants greater than 20-inches in height. If plants are under drought stress or growing slowly due to cool weather, then the threshold number would be reduced. Treatment also may be justified if plants are yellowing and aphids are present. The pea aphid is larger, green in color, and can be identified by a dark band around the base of the antennal segments. Pea aphid problems are most severe on slow growing alfalfa during early spring. Later infestations of the pea aphid during spring may cause economic problems, but generally plants 10-inches or more in height can withstand higher numbers of aphids. As with Cowpea aphids, pea aphids can cause yellowing and sometimes wilting of plants due to the removal of plant juices. The tables that follow list insecticides labeled for control of these pests in Missouri. Be sure to follow all label directions, precautions, and restrictions.

Recommended Insecticides for Management of Alfalfa Weevil Larvae - 2009

Insect Pest			
Alfalfa Weevil Larvae:			
Chemical Name	***Common Name***	***Rate of Formulated Material***	***Rate of Active Ingredient (a.i.)***
Beta-cyfluthrin	*Baythroid XL	1.6 to 2.8 fl oz/acre	0.0125 to 0.022 lb a.i./acre
Carbofuran	*Furadan 4F	1/2 to 2 pts/acre	.25 to 1 lb a.i./acre
Cholopyrifos	*Lorsban Advanced	1 to 2 pts/acre	0.5 to 1 lb a.i./acre
Chlorpyrifos 4E	*Lorsban 4E	1 to 2 pts/acre	0.5 to 1 lb a.i./acre
	*numerous products	see specific labels	see specific labels
Chlorpyrifos 4E plus			
Gamma-cyhalothrin	*Cobalt	19.0 to 38.0 fl oz/acre	
Gamma-cyhalothrin	*Proaxis	2.56 to 3.84 fl oz/acre	0.02 to 0.03 lb a.i./acre
Lambda-cyhalothrin	*Warrior	2.56 to 3.84 fl oz/acre	0.02 to 0.03 lb a.i./acre
	*numerous products	see specific labels	see specific labels
Methyl Parathion	*Chemnova Methyl 4EC	1 pt/acre	0.5 lb a.i./acre
Phosmet	Imidan	see specific label	see specific label
Zeta-cypermethrin	*Mustang Max	2.4 to 4.0 fl oz/acre	0.014 to 0.025 lb a.i./acre

Read and follow all label direction, precautions, and restrictions.
*Designated a restricted use product.

Wireworm Baits and Preplant Decisions for Corn

Wireworm is a group of insects which are often difficult to scout and manage. One method used to determine wireworm numbers prior to planting is the use of a solar baiting system. It can effectively estimate wireworm larval populations present at a site.

The scouting technique consists of placing bait stations or traps at several locations within a crop field. A minimum of two bait stations per acre is recommended, but in reality establishing 5 to 10 bait station per 30 to 40 acres of crop field should be sufficient if traps are properly located. In order to gain accurate estimates of the wireworm population, traps should be located in high risk areas such as in any grassy areas of the field or in areas where wireworms caused injury in previous

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seasons. Although trap placement in fields may occur 2-3 weeks prior to planting of the corn crop, traps placed 7-10 days prior to planting provide more accurate estimates of wireworm numbers as wireworms often remain deep in the soil until soil temperatures warm in the spring.

This trapping technique consists of digging a 4-inch deep by 6-9 inch wide hole at the soil surface. Place into the hole 2 to 1 cup equal mixture of untreated corn and wheat seed which has be pre-soaked for 24 hours prior to use in order to speed up seed germination. Fill and slightly mound each station with soil. Cover each mound with an 18-inch square of black polyethylene plastic (appropriate sized trash bag) followed by a 1-yard square sheet of clear polyethylene or similar clear plastic bag. Cover the edges of the plastic layers with soil to prevent wind damage. The black plastic layer absorbs heat and the clear plastic helps retain heat in the soil producing a "greenhouse effect" which allows for more rapid germination of the bait seed. Carbon dioxide is produced during the germination process and attracts wireworms to the bait. Just prior to planting, remove the plastic layers and soil from the bait and count the number of wireworm larvae in and around the bait. If the average number of wireworm larvae collected in all baits located in the field average one or more per bait station, the economic threshold has been exceeded and treatment is justified. If an economic infestation is found, control options implemented before or at the time of planting are recommended. Management options include such strategies as use of liquid or granular insecticides applied at planting or high rate insecticide seed treatments. Rescue treatments for this soil inhabiting insect pest are usually not effective for this pest. High infestations of this pest may result in severe stand loss, occasionally requiring the replanting of corn. An insecticide option should be used if a wireworm damaged field requires replanting. Most wireworm species found infesting corn typically live for 3 to 5 years as larvae before pupating into adult click beetles. These beetles generally live one season during which time they mate and lay eggs in the soil, often next to grass plants.

Recommended Insecticides for Management of Cow Aphids in Alfalfa - 2009

Insect Pest			
Cowpea Aphids:			
Chemical Name	***Common Name***	***Rate of Formulated Material***	***Rate of Active Ingredient (a.i.)***
Beta-cyfluthrin	*Baythroid XL	2.8 fl oz/acre	0.022 lb a.i./acre
Cholopyrifos	*Lorsban Advanced	1 to 2 pts/acre	0.5 to 1 lb a.i./acre
Chlorpyrifos 4E	*Lorsban 4E	1 to 2 pts/acre	0.5 to 1 lb a.i./acre
	*numerous products	see specific labels	see specific labels
Chlorpyrifos 4E plus			
Gamma-cyhalothrin	*Cobalt	19.0 to 38.0 fl oz/acre	
Dimethoate	*Dimethoate/Dimate	see specific labels	0.25 to 0.5 lbs a.i./acre
Gamma-cyhalothrin	*Proaxis	2.56 to 3.84 fl oz/acre	0.02 to 0.03 lb a.i./acre
Lambda-cyhalothrin	*Warrior	2.56 to 3.84 fl oz/acre	0.02 to 0.03 lb a.i./acre
	*numerous products	see specific labels	see specific labels
Methyl Parathion	*Chemnova Methyl 4EC	1 pt/acre	0.5 lb a.i./acre

Read and follow all label direction, precautions, and restrictions.
*Designated a restricted use product.

Recommended Insecticides for Management of Pea Aphids in Alfalfa - 2009

Insect Pest			
Pea Aphids:			
Chemical Name	***Common Name***	***Rate of Formulated Material***	***Rate of Active Ingredient (a.i.)***
Beta-cyfluthrin	*Baythroid XL	2.8 fl oz/acre	0.022 lb a.i./acre
Cholopyrifos	*Lorsban Advanced	1 to 2 pts/acre	0.5 to 1 lb a.i./acre
Chlorpyrifos 4E	*Lorsban 4E	1 to 2 pts/acre	0.5 to 1 lb a.i./acre
	*numerous products	see specific labels	see specific labels
Chlorpyrifos 4E plus			
Gamma-cyhalothrin	*Cobalt	19.0 to 38.0 fl oz/acre	
Dimethoate	*Dimethoate/Dimate	see specific labels	0.25 to 0.5 lbs a.i./acre
Gamma-cyhalothrin	*Proaxis	2.56 to 3.84 fl oz/acre	0.02 to 0.03 lb a.i./acre
Lambda-cyhalothrin	*Warrior	2.56 to 3.84 fl oz/acre	0.02 to 0.03 lb a.i./acre
	*numerous products	see specific labels	see specific labels
Methyl Parathion	*Chemnova Methyl 4EC	0.5 to 1 pt/acre	0.25 to 0.5 lb a.i./acre
Permethrin	*numerous products	see specific label	0.05 to 0.2 lbs a.i./acre
Zeta-cypermethrin	*Mustang Max	4.01 fl oz/acre	0.014 to 0.025 lb a.i./acre

Read and follow all label direction, precautions, and restrictions.
*Designated a restricted use product.

Wayne Bailey
BaileyW@missouri.edu
(573) 864-9905

Soybean Cyst Nematode Management: Take the Test. Beat the Pest.

By Allen Wrather

Here is the situation: Soybean cyst nematode (SCN) is the worst pest of soybeans in Missouri as well as the USA.

Fortunately, this pest can be managed, but farmers must take steps before planting to protect their 2009 soybean crop against these nematodes.

The first step is to test the soil for SCN, and this must be done in the next few days. University of Missouri Extension Regional Agronomists have information about taking and submitting soil samples for SCN analysis, and more information is available at the University of Missouri web site http://soilplantlab.missouri.edu/nematode. The results of soil analysis for SCN will be available by late-April or early-May if soil samples are submitted by April 8 to 10.

The second step is to rotate crops and plant SCN resistant varieties in fields infested with this pest. These are the only useful SCN control methods available.

Crop rotation is a great SCN control method because SCN numbers decline during years when crops such as corn, grain sorghum, a forage crop, or cotton are planted. The number of years these crops should be planted before planting soybean again will depend on the number of SCN in the soil.

Soybean cyst nematode resistant varieties are available and most yield well. Very few varieties are resistant to all types of SCN so selecting the best variety to plant is difficult. Information about soybean variety resistance to SCN is available at University of Missouri Extension Offices, and the University of Missouri Variety Testing web site, http://agebb.missouri.edu/cropperf/vartest. Visitors to this site should select "Soybean", then select "Varieties", then select the soybean seed company of interest, and then "Submit". This site lists company provided information about varieties they sell and the source of SCN resistance used to develop each variety. Farmers should also ask the representatives for the soybean seed companies they buy from about the best SCN resistant varieties to plant in each field.

More information about SCN management is available in the University of Missouri Extension Guide titled, Soybean Cyst Nematode: Diagnosis and Management. This guide is available at http://muextension.missouri.edu/xplor/agguides/crops/g04450.htm.

The Missouri soybean farmer checkoff managed by the Missouri Soybean Merchandising Council funded much of the research by University of Missouri scientists to develop SCN resistant varieties and determine that crop rotation is a great SCN management tool.

Following these suggested procedures will give soybean farmers a better chance of producing a profitable soybean crop in 2009.

Allen Wrather
WratherJ@missouri.edu
(573) 379-5431

Native Plant Sale

Saturday, April 11, 10AM–2PM

MU Bradford Research and Extension Center

This event is free for everyone to attend rain or shine!

Once established, native plants require less water and fertilizers than non-natives. Join us for a perfect opportunity to find all the native plants you need for your home garden, and support Missouri businesses.

featuring:

- Four Missouri native plant and shrub vendors
- Native plant themed books and items made by local artists for sale
- Many learning opportunities through informative booths and demonstrations!

Bird Watch Tour

7:00 a.m. – 10:00 a.m.

Please R.S.V.P. with Thresa at 884-7945 or by email: ChismT@missouri.edu

Bradford Research and Extension Center is located east of Columbia at 4968 Rangeline Road. See our Website for detailed directions: www.aes.missouri.edu/bradford. Phone: 573-884-7945. Ask for Thresa Chism or Tim Reinbott

Weather Data for the Week Ending April 5, 2009

By Pat Guinan

Station	County	Weekly Temperature (oF)						Monthly Precipitation (in.)		Growing Degree Days‡	
		Avg. Max.	Avg. Min.	Extreme High	Extreme Low	Mean	Departure from long term avg.	March 1-March 31	Departure from long term avg.	Accumulated Since Apr. 1	Departure from long term avg.
Corning	Atchison	57	33	69	24	44	-3	1.88	-0.45	2	+2
St. Joseph	Buchanan	*	*	*	*	*	*	*	*	*	*
Brunswick	Carroll	58	34	70	28	46	-3	4.57	+2.19	4	+3
Albany	Gentry	56	33	66	25	44	-3	3.50	+1.16	2	+2
Auxvasse	Audrain	60	35	70	32	48	-1	3.37	+0.58	3	+2
Vandalia	Audrain	59	35	67	32	48	0	3.89	+0.88	2	+1
Columbia-Jefferson Farm	Boone	61	36	70	30	48	-2	3.80	+0.86	5	+1
Columbia-South Farms	Boone	61	36	70	30	48	-2	4.14	+1.20	5	+1
Williamsburg	Callaway	61	35	69	32	48	-1	2.88	-0.56	3	+2
Novelty	Knox	56	33	63	28	45	-3	5.18	+2.86	0	0
Linneus	Linn	57	33	70	28	45	-3	5.62	+3.20	2	+2
Monroe City	Monroe	57	35	63	32	46	-2	4.86	+2.29	0	0
Versailles	Morgan	64	37	72	31	50	-1	4.21	+1.24	9	-1
Green Ridge	Pettis	61	35	71	28	47	-2	3.33	+0.53	7	+7
Lamar	Barton	61	36	73	30	48	-3	3.53	-0.04	9	-1
Cook Station	Crawford	65	34	69	30	51	-1	3.35	-0.59	7	-4
Round Spring	Shannon	66	33	71	27	50	-1	3.56	-0.45	2	-6
Mountain Grove	Wright	61	37	66	32	49	-1	2.81	-1.51	5	0
Delta	Cape Girardeau	66	40	72	33	53	0	3.48	-0.90	15	-2
Cardwell	Dunklin	69	42	74	37	55	0	4.05	-0.36	24	-5
Clarkton	Dunklin	67	41	72	36	54	0	2.56	-1.74	19	-4
Glennonville	Dunklin	66	41	70	36	55	0	2.59	-1.50	22	-3
Charleston	Mississippi	66	40	68	35	53	-1	2.48	-1.65	17	-6
Portageville-Delta Center	Pemiscot	68	43	73	38	56	+1	2.55	-1.59	28	+3
Portageville-Lee Farm	Pemiscot	68	43	71	38	56	+1	3.08	-1.01	28	+3
Steele	Pemiscot	69	43	74	38	56	+1	3.41	-0.93	30	+3

* Complete data not available for report

‡Growing degree days are calculated by subtracting a 50 degree (Fahrenheit) base temperature from the average daily temperature. Thus, if the average temperature for the day is 75 degrees, then 25 growing degree days will have been accumulated.

Pat Guinan
Commercial Agriculture Program
573.882.5908
GuinanP@missouri.edu