Issues in Agriculture

The Newsletter about Integrated Pest Management for the El Paso Valley

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ANNOUNCEMENTS

- You can download this and other IPM newsletters, check updates, and view upcoming events at the El Paso Texas A&M AgriLife Extension IPM website: http://elp.tamu.edu/integrated-pest-management/
- **Gardening 101 Workshop Series**: All sessions are free of charge and will be held at the Multipurpose Center on 9301 Viscount. On June 26, from 4:00 PM to 5:30 PM, the topic of discussion on this date will be Integrated Pest Management: Bugs in your Garden. Information: Denise Rodriguez Texas A&M AgriLife Extension (915) 860-2515.
- **Texas Pecan Growers Association Annual Conference & Trade Show:** July 12-15, 2015. Embassy Suites, Frisco, TX. Contact TPGA, 979-846-3285 or pecans@tpga.org

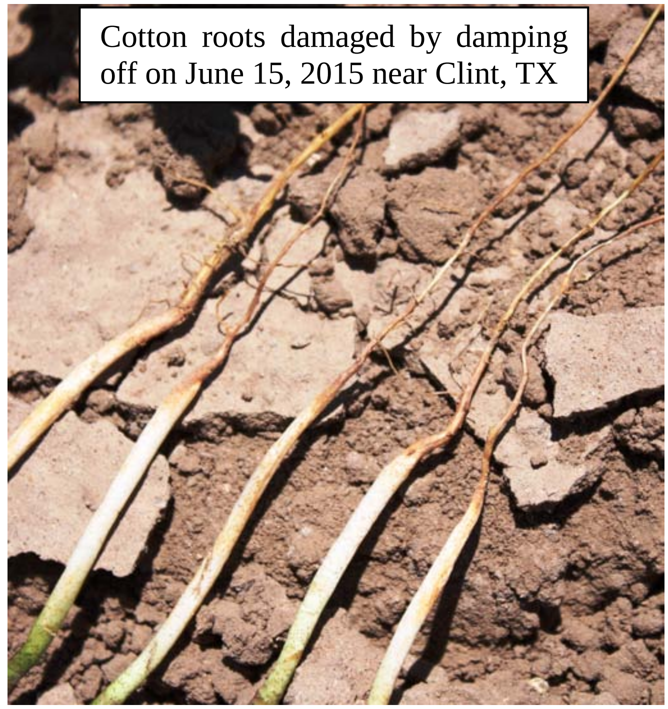
GENERAL SITUATION:

Our temperature forecast calls for today and the following four days with maximum daily temperature readings breaking above the 100°F mark. This feels more like the temperatures we are accustomed to at this time of the year. This week, I have seen problems in cotton fields with seedling root diseases, cotton aphid infestations, herbicide drift onto DP340 pima cotton, and poor weed control (lambsquarters) in a glyphosate-treated RoundUp-ready cotton field. In pecan, second-generation PNC moths were captured starting on June 11 near Tornillo and on June 16 near Fabens/Clint area. Blackmargined pecan aphids have surpassed action thresholds and insecticide applications have been made or are currently ongoing. Some fields have received flood irrigation in El Paso Lower Valley during the last few days.

COTTON:

Cotton plants are in the first or beginning the second week of squaring. Now we need to carefully monitor **cotton fleahoppers and Lygus bugs**. As I mentioned in the previous issue of my newsletter, cotton fleahoppers feed on pinhead or smaller squares in the terminals while Lygus bugs feed on squares and small bolls. Their feeding damage causes shedding of the squares and may impact yield. We have experienced high population levels of Lygus bugs for the last 3 years, and, judging from Lygus population levels that I have recently observed in alfalfa, this year may continue that trend.

On Monday June 15, I met a group of consultants and cotton growers trying to figure out why a section of a cotton field near Clint had dead or dying cotton plants. The plants in this section looked stunted, weak, and in poor condition. These cotton plants had experienced a sustained, slow health decline. Many possible causes were discussed including: soil texture, soil fertility, salinity, rabbit damage, grasshopper feeding, and sandblasting by strong wind gusts. We dug up plants to observe root development. In the end, we concluded that the most likely culprit was **damping off** or root disease complex exacerbated by prolonged cold and wet soil conditions at planting. You may recall that in the end of April and beginning of May we had sustained low temperatures with a short break in between (a couple of days) with warmer conditions.

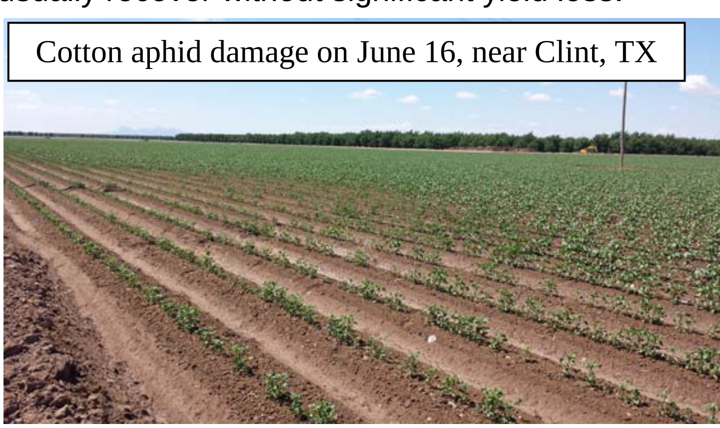


Cotton roots damaged by damping off on June 15, 2015 near Clint, TX

I also saw a cotton field with obvious **herbicide drift damage** applied for weed control in an adjacent public road near Clint. I heard complaints such as this one before; which leads me to believe that this scenario is not rare.

Herbicide-damaged cotton plants next to public road (June 15, 2015 near Clint, TX)

There have been a few cotton fields that have suffered from **cotton aphid** feeding damage. The aphid populations have been localized in relatively small patches. This allows for spot applications of insecticides. When cotton aphids are controlled early in the season, cotton plants usually recover without significant yield loss.

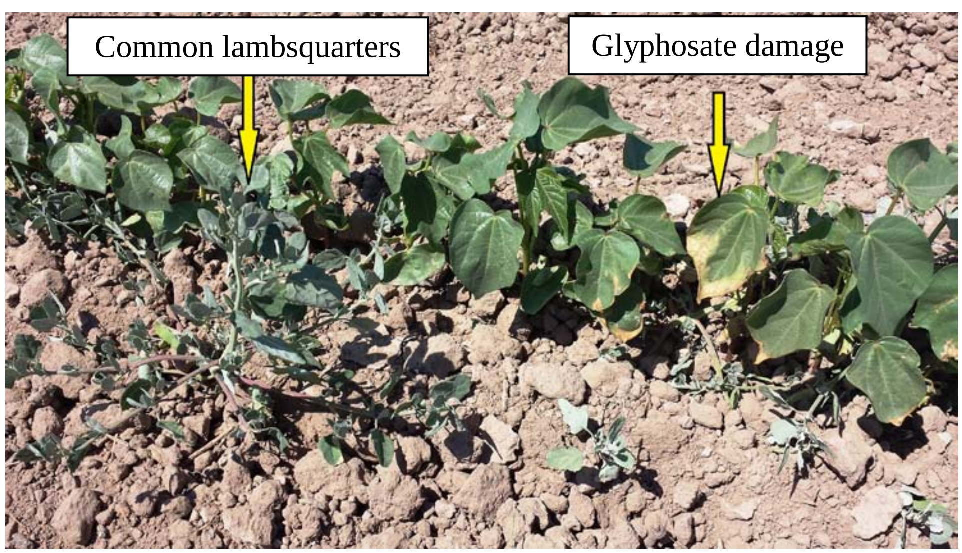


Cotton aphid damage on June 16, near Clint, TX

Poor control of common lambsquarters with glyphosate: On June 16, I inspected a cotton field southwest of Fabens with poor weed control after 2 applications of Roundup PowerMAX®. Both applications were made with a spray mixture of 15 gal/acre (using a 300-gallon tank), a spray width covering 18 cotton rows, and adding the non-ionic oil concentrate Penetrator®Plus at 1%. The first application was made on June 1, 2015 using 32 oz of Roundup PowerMAX®/acre. After observing poor weed control, a second application was made on June 9 using 48 oz of Roundup PowerMAX®/acre. Now (over two weeks after the first application), most weed species are dead, but approximately 10-15% of common lambsquarters plants, also known as Goosefoot in the plant family Chenopodiaceae, are doing well. Following suggestions by Dr. Charles Allen, I used RTU RoundUp to spray two herbicide rates in two rows. The first row received a "light" application and the second row received a "heavy" spray (soaking the plants well to the point of runoff). I returned to the field one and two days after treatment and I noticed herbicide-damaged cotton plants adjacent to the hand-sprayed lambsquarters. These weeds appeared undisturbed while the cotton leaves showed herbicide damage. It is too early to make any conclusions, but I will continue visiting this field and evaluate alternatives. Dr. Peter Dotray, Professor of Weed Science with Joint Appointment at Texas A&M Agrilife Research & Extension Service and Texas Tech University, indicated that broadleaf weed control in cotton is difficult, but it is possible to use Staple herbicides when weeds are small and being mindful of crop rotation restrictions. Also, the Liberty herbicide may be used in Liberty Link cotton varieties. Another possibility is the use of hooded sprayers with herbicides such as: Aim, ET, Liberty, or Gramoxone. Ultimately, in some cases, cultivation and hand hoeing may be the best options. I observed a mixture of dead, dying, and live common lambsquarter plants; which to me would suggest the possibility of a glyphosate resistance problem.

Surviving common lambsquarter after two applications of glyphosate. June 16, 2015

However, there has not been a documented case of lambsquarter resistance to glyphosate anywhere in the world. We may be dealing with naturally reduced glyphosate susceptibility in these lambsquarter plants. Later in the season, I would like to obtain lambsquarters seeds, from this field, and send to Dr. Dotray for glyphosate-resistance studies. The extension publication "*4-step Program for Managing Glyphosate Resistant Pigweeds in Texas Cotton*" offers great advice on glyphosate resistance management (click here).



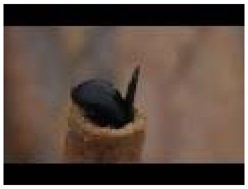
PECAN:

The **second-generation pecan nut casebearer** (PNC) moths were initially captured near Tornillo on June 11. Usually, in Clint and Fabens PNC moths appear one to two weeks later than PNC moths near Tornillo; especially in the first-generation. I was able to capture second-generation PNC moths near Clint on June 16. This year in El Paso, the first-generation PNC moths were spread out for a period of approximately 3 weeks and many pecan growers had to make more than one insecticide application to achieve adequate control. Generally, it is much more important to control the first generation, but occasionally second and even third generation may cause significant yield damage. Therefore, it is advisable to monitor PNC population dynamics and plant damage throughout the season (from mid April to early October). As you all know, insecticide applications should be made based on PNC egg counts found on the nut clusters and not on the numbers of moths captured in the traps

The **blackmargined pecan aphid** population levels have increased substantially and in many cases have surpassed recommended action thresholds (an average of 25 blackmargined pecan aphids per compound leaf). You should make your decision whether or not to control this pest based on actual aphid counts and not on honeydew accumulation on the leaves. Field research conducted in El Paso by Dr. Mark Muegge and me, for the last 4 years, has found that insecticides containing imidacloprid as the main active ingredient provide little or no blackmargined aphid control. You need to be mindful that using insecticides in the group 4A (same as imidacloprid) might result in poor control as well. Rotation of insecticides from different chemical groups is recommended. In the following pages, I am attaching the results of recent local field evaluations of selected insecticides for your consideration of treatment options.


Blackmargined pecan aphids (photo by Bill Ree)

ENTOMOLOGICAL SIDENOTE:



Insect life struggles: I would like to share with you a YouTube video that I filmed recently in my patio of a carpenter bee (*Xylocopa* spp.) and its kleptoparasite (possibly in the family Chrysididae):

https://www.youtube.com/watch?v=UfkU2tpBT3Y

The Texas AgriLife El Paso IPM Program is partially supported by the following organizations:
West Texas Pecan Association
Ag Market Resources
El Paso Pest Management Association
Texas Pest Management Association
Valley Gin Company, Tornillo

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PECAN: *Carya illinoinensis* (Wangenh.) K. Koch

BLACKMARGINED APHID CONTROL, 2010

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Blackmargined Aphid (BMA): *Monellia caryella* (Fitch)

Efficacy of several insecticides was evaluated for BMA control. This study was conducted in a commercial pecan orchard near Fabens, TX. A single pecan tree constituted an experimental unit. Each experimental unit was bordered by untreated pecan trees to reduce potential drift contamination. Experimental units were arranged in a RCBD with 5 treatments replicated 3 times. Insecticide applications were made using a high pressure sprayer calibrated to deliver 100 gpa @ 100 psi. From each experimental unit 3 randomly selected compound leaves were examined for BMA. Adult and nymph aphids found were counted separately and recorded. Treatments were applied on 18 Sept after pre-treatment samples had been collected. Post treatment samples were taken at 3, 10 and 16 days after treatment. All data were subjected to ANOVA. Treatment mean separation was performed using Fisher's Protected LSD (P=0.05).

Black margin aphids were below economically damaging population densities throughout the duration of this test Table 1. Prior to treatment application, BMA population densities were statistically equal among untreated check and treated plots. Except for Admire Flex 4 all insecticide treated plots, regardless of sample date had significantly or numerically lower BMA adult and nymph population densities relative to the untreated check. Although not statistically significant BMA population densities were higher in the Admire flex 4 treated plots relative to the untreated check plots at 16 DAT. This result warrants further investigation into the possibility of BMA resistance to imidacloprid, the active ingredient in Admire flex 4. Phytotoxicity was not observed during the course of this study.

This research was supported by industry gift(s) of [*pesticide and/or research funding*].

Treatment	Rate (oz/acre)	Mean BMA adults/3 Compound Leaves				Mean BMA nymphs/3 Compound Leaves			
		0 DAT	3 DAT	10 DAT	16 DAT	0 DAT	3 DAT	10 DAT	16 DAT
UTC	-	2.67	4.11a	7.67	3.33ab	18.44	5.22a	11.67	14.4a
Brigade	20	2.22	0.11b	2.33	0.44c	10.33	1.33bc	3.67	0.00b
Movento	8	2.67	2.89ab	2.78	1.78bc	6.00	2.22b	1.33	1.22b
Admire Flex4	2	2.11	3.67a	6.33	3.89a	12.00	4.22a	5.33	21.00a
Hero	10.3	3.33	0.22b	5.00	1.11c	7.33	0.55c	5.33	0.56b
LSD (P=0.05)		1.74	2.84	5.20	2.03	13.64	1.63	7.82	9.25
P>F		NS	0.0121	NS	0.0061	NS	<0.0001	NS	<0.0001

Means within columns not followed by the same letter are significantly different, (Fisher's Protected LSD).
*NS = Not Significant.

Part II. Materials Tested for Arthropod Management

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PECAN: *Carya illinoinensis* (Wangenh.) K. Koch

BLACKMARGINED APHID CONTROL, 2010

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Brand Name	Formulation	Common Name	Composition	Manufacturer
Brigade	WSB	Bifenthrin	(2-methyl[1,1′-biphenyl]-3-yl)methyl (1*R*,3*R*)-*rel*-3-[(1*Z*)-2-chloro-3,3,3-trifluoro-1-propen-1-yl]-2,2-dimethylcyclopropanecarboxylate	FMC Corporation Agricultural Products Group, Philadelphia, PA 19103
Hero		Zeta-cypermethrin, bifenthrin	(*S*)-cyano(3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate; 4-chloro-2-butynyl (3-chlorophenyl)carbamate	FMC Corporation Agricultural Products Group, Philadelphia, PA 19103
Movento		spirotetramat	*cis*-3-(2,5-dimethylphenyl)-8-methoxy-2-oxo-1-azaspiro[4.5]dec-3-en-4-yl	Bayer CropScience LP, Research

			ethyl carbonate	Triangle Park, NC 27709
Admire Flex 4		imidacloprid	2*E*)-1-[(6-chloro-3-pyridinyl)methyl]-*N*-nitro-2-imidazolidinimine	Bayer CropScience LP, Research Triangle Park, NC 27709

 doi: 10.4182/amt.2012.D18

(D18)

PECAN: *Carya illinoinensis* (Wangenh.) K. Koch

BLACKMARGINED APHID CONTROL, 2011

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Blackmargined aphid (BMA): *Monellia caryella* (Fitch)

Efficacy of several insecticides was evaluated for BMA control. This study was conducted in a commercial pecan orchard near Clint, TX. A single pecan tree constituted an experimental unit. Experimental units were arranged in a RCBD with 8 treatments replicated 3 times. Insecticide applications were made using a high pressure sprayer calibrated to deliver 100 gpa @ 100 psi. From each experimental unit 4 randomly selected compound leaves were examined for BMA. Adult and nymph aphids found were counted separately and recorded. Treatments were applied on 22 Sept after pre-treatment samples had been collected. Post treatment samples were taken at 5, 9 and 20 days after treatment. All data were subjected to ANOVA. Treatment mean separation was performed using Fisher's Protected LSD (P=0.05).

Prior to treatment application significant differences of BMA population densities were not found among treated and check plots. All insecticide treated plots, at 5 DAT, had significantly lower BMA adult and nymph population densities relative to the check plots. Adult and nymph BMA densities were numerically, but not significantly lower in the treated plots relative to the check plots at 9 DAT. Adult and nymph BMA densities were not significantly different among treated plots at 5 or 9 DAT. By 20 DAT only Brigade and Hero treated plots had significantly lower adult and nymph BMA densities relative to the check plots. Endigo treated plots had significantly fewer adult but not nymph BMA densities at 20 DAT. Overall, Brigade and Hero appeared to provide superior BMA control relative to the other treatments in this study. Phytotoxicity was not observed during the course of this study.

Treatment	Rate (oz/acre)	Mean BMA adults/4 Compound Leaves				Mean BMA nymphs/4 Compound Leaves			
		0 DAT	5 DAT	9 DAT	20 DAT	0 DAT	5 DAT	9 DAT	20 DAT
Check	-	8.7	37.7a	45.3a	37.3a	17.3	67.3a	88.3a	57.7ab
Admire Pro	14	8.0	12.7b	36.7ab	40.0ab	22.3	20.0bc	60.7ab	55.7ab
Brigade	8	9.7	15.3b	25.0b	17.7b	21.3	24.3bc	47.7ab	24.3c
Centric	2.5	11.3	16.3b	30.3ab	48.3a	26.3	28.3b	52.7ab	78.3a
Cobalt	19	12.0	14.7b	20.0b	17.3b	37.3	21.0bc	37.7b	29.7bc
Endigo	6	11.0	8.0b	25.7b	25.0bc	28.0	8.0c	42.3b	35.0bc
Hero	10.3	10.3	11.7b	26.7ab	7.3c	31.3	16.7bc	43.0b	22.0c
Leverage 360	2.8	9.0	14.0b	25.0b	54.3a	16.7	20.7bc	49.3a	83.3a
LSD (P=0.05)		9.18	12.1	19.4	18.6	34.9	19.3	36.8	30.7
P>F		NS	0.0049	NS	0.0008	NS	0.0006	NS	0.0029

Means within columns not followed by the same letter are significantly different, (Fisher's Protected LSD).
*NS = Not Significant.

PECAN: *Carya illinoinensis* (Wangenh.) K. Koch

BLACKMARGINED APHID CONTROL, 2012

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Pretreatment counts were significantly different among treatments and blocks only for the adult BMA data. This variability may have been caused by sampler count variability, but is difficult to say as aphid population densities naturally vary considerably. Black margined aphid population densities decreased considerably in the Check plots 7 DAT and 14DAT relative to pretreatment densities. This phenomenon is not unusual and occurs frequently with BMA populations during the middle part of the pecan growing season. However, this drop in aphid density reduced the ability of this study to provide data needed to evaluate the efficacy of these treatments. At 7DAT the only notable significant difference found was the increase of BMA adult and nymph densities in the Admire Pro and Centric treated plots relative to the Check plots. All other treatments were not significantly different from the Check. In this study 3 neo-nicotinoid insects were evaluated for efficacy against BMA; Admire Pro (imidacloprid), Centric (thiomethoxam), and Intruder (Acetamiprid). Results of this study suggest that black margined aphids showed apparent resistance to two of them (imidacloprid and Thiamethoxam). Why acetamiprid did not show this trend is unknown. This result is important as it validates previous findings that BMA have been selected for resistance to some neo-nicotinoid insecticides. Significant differences were also found 14DAT but once again primarily due to the lack of control provided by the neo-nicotinoid insecticide treatments.

To reduce the effect of variability among pretreatment counts, the Henderson-Tilton formula was applied to the mean BMA data. This formula takes into account pretreatment and post-treatment data in both treatment and check groups (Henderson, C.F. and E.W. Tilton, 1955. Tests with acaricides against the brown wheat mite, J. Econ. Entomol. 48:157-161.) Data are then presented as percent control. Negative values indicate a lack of control or higher population densities relative to the check densities. Positive values indicate a reduction in population density relative to the check.

At 7 and 14DAT all the neonicotinoid treated trees possessed higher BMA nymph population densities (Admire Pro, Centric) or less than 50% control (Intruder). Only Beleaf provided more than 60% control regardless of DAT or application rate. Effect of the insecticide treatments on BMA adults was more ambiguous; however, the neonicotinoid insects had higher adult population densities on at least one of the post treatment sample dates relative to the control. All other treatments possessed lower adult population densities relative to the check. None; however, provided more than a 60% reduction in adult aphid density relative to the check. Overall, the Beleaf treatments provided the highest % control regardless of application rate.

Mean BMA nymphs/compound leaf
Tree Test

Treatment	Rate (oz/ acre)	0 DAT*	7 DAT	14 DAT	% BMA Control* 7 DAT	% BMA Control 14 DAT
Check	-	4.7	2.9bc	1.2c		
Admire Pro	2	9.3	13.1a	2.9ab	-128.3	-22.1
Beleaf High	2.8	8.9	1.1c	0.4c	80.0	82.4
Beleaf Medium	2.4	10.3	2.5bc	0.8c	60.7	69.6
Beleaf Low	2	8.7	1.8bc	0.5c	66.5	77.5
Centric	2.5	8.1	10.7a	4.0a	-114.1	-93.4
Fulfill	4	9.5	1.9bc	1.7bc	67.6	29.9
Requiem	128	8.2	4.4bc	1.2c	13.0	42.7
Intruder	2.6 (w)	7.7	2.4bc	1.7bc	49.5	13.5
KNO3	20.5 (w)	12.3	5.5b	1.4c	27.5	55.4
LSD (P=0.05)		NS	4.0	1.4	--	--
P>F		NS	0.0001	0.0001	--	--

Treatment	Rate (oz/acre)	Mean BMA adults/compound leaf _ Tree Test 0 DAT	7 DAT	14 DAT	% BMA Control* 7 DAT	% BMA Control 14 DAT
Check	-	4.1bcd	2.7b	1.1bc	--	--
Admire Pro	2	7.2ab	5.3a	1.1bc	-11.8	43.1
Beleaf High	2.8	3.7cd	1.2b	0.7bc	50.8	29.5
Beleaf Medium	2.4	4.9bcd	2.8b	0.7bc	13.2	46.8
Beleaf Low	2	6.7abc	2.1b	1.0bc	52.4	44.4
Centric	2.5	7.1ab	5.6a	2.5a	-19.8	-31.2
Fulfill	4	5.5abcd	1.7b	0.6c	53.1	59.3
Requiem	128	3.3d	2.1b	0.5c	3.4	43.5
Intruder	2.6 (w)	3.3d	2.1b	2.0ab	3.4	-125.9
KNO3	20.5 (w)	8.1a	2.9b	1.4abc	45.6	35.6
LSD (P=0.05)		3.2	2.3	1.3	--	--
P>F		0.0175	0.0019	0.0526	--	--

Treatment	Rate (oz/acre)	Mean Total BMA/compound leaf _ Tree Test 0 DAT	7 DAT	14 DAT	% BMA Control* 7 DAT	% BMA Control 14 DAT
Check	-	8.8	5.7bc	2.3bcd	--	--
Admire Pro	2	16.5	18.3a	4.0b	-71.2	7.2
Beleaf High	2.8	12.7	2.3c	1.1d	72.0	66.9
Beleaf Medium	2.4	15.1	5.3bc	1.5d	45.8	62.0
Beleaf Low	2	15.3	3.9bc	1.5d	60.6	62.5
Centric	2.5	15.1	16.3a	6.5a	-66.7	-64.7
Fulfill	4	14.9	3.5bc	2.3bcd	63.7	40.9
Requiem	128	11.5	6.5bc	1.7cd	12.7	43.4
Intruder	2.6 (w)	10.9	4.5bc	3.7bc	36.3	-29.9
KNO3	20.5 (w)	20.5	8.4b	2.8bcd	36.7	47.7
LSD (P=0.05)		NS	5.7	2.2	--	--
P>F		NS	0.0001	0.0001	--	--

*Henderson's formula applied to the mean BMA densities/compound leaf. Henderson's formula accounts for variation in insect densities across treatment and control plots.

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PECAN: *Carya illinoinensis* (Wangenh.) K. Koch

BLACKMARGINED APHID CONTROL, 2013

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Blackmargined Aphid (BMA): *Monellia caryella* (Fitch)

Efficacy of several insecticides was evaluated for BMA control. This study was conducted in a commercial pecan orchard near Fabens, TX. A single pecan tree constituted an experimental unit. Each experimental unit was bordered by untreated pecan trees as buffers to help reduce potential drift contamination. Experimental units were arranged in a RCBD with 10 treatments replicated 4 times. Insecticide applications were made using a high pressure sprayer calibrated to deliver 100 gpa @ 100 psi. From each experimental unit 3 randomly selected compound leaves were examined for BMA. Adult and nymph aphids found were counted separately and recorded. Treatments were applied on 11 Oct after pre-treatment samples had been collected. Post treatment samples were taken at 10 and 25 days after treatment. All data were subjected to ANOVA. Treatment mean separation was performed using Fisher's Protected LSD (P=0.05).

Although total BMA densities were moderately high they never exceeded economically damaging population densities throughout the duration of this test (Table 1). Prior to treatment application, BMA adult and nymph population densities were statistically equal among untreated check and treated plots. At 10DAT the Induce, Agriflex, Agrimek and Admire Pro treatments did not significantly reduce BMA adult population density. All treatments except Agriflex and Admire Pro significantly reduced BMA nymph population densities. At 25DAT only the Beleaf treated trees had significantly lower BMA adult population densities relative to the untreated check trees and BMA nymph populations were not significantly lower in any of the treated trees relative to the untreated check. However, population densities of BMA nymphs were substantially lower in the Endigo, Voliam and Beleaf treated trees relative to the untreated check trees. Interestingly, the NIS and Agriflex treated trees had significantly higher BMA nymph population densities relative to the untreated check trees. Whether this result is a real cause and effect or a result of experimental and or sampling error requires further studies.

Treatment	Rate (oz/acre)	Mean BMA adults/3 Compound Leaves			Mean BMA nymphs/3 Compound Leaves		
		0 DAT	10 DAT	25 DAT	0 DAT	10 DAT	25 DAT
UTC	-	8.2	7.8ab	4.2bc	14.3	24.2a	11.3bcd
Induce	4.8	6.9	7.9a	9.2a	10.7	11.8bc	31.7a
Agriflex+NIS	5.5	4.6	5.7abc	6.4ab	11.7	15.6ab	30.6a
Agrimek+NIS	2.5	8.7	5.5abc	5.7bc	20.8	13.4b	17.9bc
Admire Pro	2	4.6	4.7bcd	4.8bc	7.6	14.7ab	15.0cb
Endigo	5	10.8	4.2cd	3.1cd	26.3	5.8bc	5.7cd
Water*	100g/a	10.1	3.9cd	4.8cb	17.8	10.7bc	19.7ab
Voliam Express	9	10.2	3.2cd	3.4cd	21.6	6.3bc	9.7bcd
Fulfill+NIS	4	8.7	2.7cd	4.7cb	9.8	2.5c	12.3bcd
Beleaf	2.8	8.4	2.4d	1.0d	21.3	2.2c	1.9d
LSD (P=0.05)		6.0	3.2	2.9	15.8	10.6	12.5
P>F		NS	0.0039	<0.0001	NS	0.0017	<0.0001

Means within columns not followed by the same letter are significantly different, (Fisher's Protected LSD).
*NS = Not Significant.
*Water was applied at a rate of 100gallons/acre.