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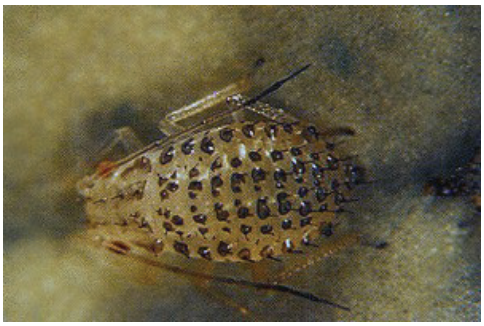
Alfalfa Insect Application Timing is upon us

Phil Mulder, OSU Extension Entomologist

With the advent of alfalfa weevil control quickly upon us, I thought it might be appropriate to share results of last year's insecticide efficacy trial. Populations in our trials this year just reached threshold levels this week and our tests have been sprayed. I have heard from several locations around the state and the same is true in many other locations. In addition, populations are not extremely high, which our egg sampling indicated would be the case. Growers should at least scout fields now to make treatment decisions soon. Fall-planted alfalfa may not experience significant numbers of weevils in the first year of growth; however, aphids (in particular spotted or cowpea aphids) could be a problem. So far, aphid populations have been sporadic across the state with lighter populations of spotted alfalfa aphids in moderate to high rainfall areas. Some parts of southwestern Oklahoma have experienced high (treatable) levels of these insects already. Favorable growing conditions and adequate rainfall will help keep aphid populations in check and favor alfalfa growth.



Evaluations of Insecticide Performance for Control of Alfalfa Weevil Larvae, 2007

Phil Mulder, OSU Extension Entomologist and S.K. Seuhs, Extension Associate

Ten chemical insecticides at varying rates and mixtures were evaluated for efficacy in controlling AW larvae infesting the first crop of a fifth year stand of "OK 49" alfalfa at the Agronomy Research Station, Stillwater, OK. Pretreatment samples indicated low larval numbers with a mean population of 2.0 larvae/25stems. In addition, low populations of aphids (7.5/25stems) were observed. In conjunction with an early stubble application of Warrior (.03 lbs./AI/acre) on 21 February, 1.0 lb. AI/acre of Sinbar herbicide was tank mixed in the early stubble plots, then later applied alone to the remainder of the test area for weed control. A late stubble treatment was applied on 5 March using Warrior (.03 lbs./AI/acre). Threshold levels for AW larvae in the remaining plot areas was reached and insecticides were applied on 14 March using a tractor sprayer calibrated to deliver 20 gpa at 23 psi through four,

flooding nozzles when traveling at 3 mph. On this date, AW larval and aphid populations averaged 30.5 and 18.5 per 25 stems, respectively. Treatments were arranged in a RCB design using plots 3.9 x 9.1 m in size, replicated 4 times. Sampling was conducted 6 and 14 DAT (early stubble), 3 and 7 DAT (late stubble) and continued 3,7,14, 21, 27 and 36 DAT from the first threshold application, by pulling 25 stems per plot and placing them in standard Berlese funnels to extract insects for counting. Dry matter yields were estimated for first harvest on 14 May by removing forage from a 1 x 5 m area in each plot using a flail-type harvester. Subsamples were dried for determination of moisture content and yields were calculated on a dry weight/acre basis.

Weather conditions for the first three days after threshold treatment were moderate for activity of insects, with no rainfall and a mean daily high temperature of 51.87° F. During the remainder of the trial, through 19 April, a total of 7.12 inches of rainfall occurred and the mean daily high temperature was 57.1o F. During the period between the end of sampling and plot harvest (two and a half weeks), an additional 8.16 inches of rainfall occurred. In addition, an unusually late freeze occurred during the first week of April allowing temperatures to dip below freezing and into the mid to low 20's for three consecutive nights. These extreme temperatures extended for more than three hours each night. The population density of AW was at the economic threshold at the time of treatment and rose to 71.0 larvae/25 stems at 7 DAT in the untreated alfalfa. During the first week after treatment, all insecticides decreased AW larval densities below the levels recovered in untreated alfalfa. Average percent control for AW was calculated from infestations recovered 3 to 36 DAT. Throughout the test period, most insecticides significantly reduced AW populations below levels recovered in untreated alfalfa. Three DAT, specific insecticides began to perform better than others and this performance remained consistent throughout the trial. Average percent control of AW larvae from 3 DAT to 36 DAT ranged from a low of -36.0 % for DPX-261 (.1 lb. AI/acre) to a high of 92.0 % for Warrior (late stubble-0.03 lb. AI/acre). DPX-261 (.066 lb.AI/A) provided -2.0 % control and LAF-1 (1.0 lb. AI/A) provided 58% control. All other formulations provided 60 % control or better. Interestingly, throughout four of the first six sample dates (3DAT through 21DAT) as many as seven formulations provided 90% or better control of AW larvae. Twenty-one DAT the highest levels of control were attained with seven of the 16 treatments experiencing greater than 90% control. During that sampling period, the greatest level of control was obtained in alfalfa treated with GF-1846 (.0567 lb. AI/A - 97%). In contrast, the lowest level of control during that same time frame, was recovered from alfalfa treated with DPX-261.

Due to unseasonable cold weather conditions early and increased rainfall, alfalfa aphid numbers were greatly diminished until later in the study. Population densities for all aphids were relatively low until the last three sample dates. BAA reached a high of 345.8 aphids/25 stems 21DAT in untreated alfalfa, while numbers reached as high as 265.0 aphids/25 stems in other treatments. No other alfalfa aphid populations (PAA, SAA, CPA) were above 75.0 aphids/25 stems (treated or untreated) throughout the entire trial period. Average percent control for BAA ranged from a low of -27% for DPX-261 (0.1 lb. AI/acre) to a high of 89.0% with LAF-1 (1.0 lb. AI/acre). From 3DAT to 36DAT, average percent control of all aphids sampled ranged from a low of 9.5% with DPX-261 (0.1 lb. AI/acre) to a high of 88.0% with GF-1846 (0.567lb./AI/acre). During the first sample date (3DAT) all treatments had 90.0% or greater control. However, beginning at 7DAT to the end of the evaluation, DPX-261 at both rates began to decline and through the end of the test both areas treated with this material averaged less than 40% control while remaining formulations averaged greater than 70% control.

Yield of alfalfa at first harvest ranged from a high 6663.0 lb./acre in the alfalfa treated with Warrior (late stubble) (0.03 lb. AI/acre) to a low of 3013.0 lb./acre in the untreated alfala. While significant differences were found in harvest yields between untreated alfalfa and the various treatments, no significant differences were found in the top eight treatment yields.

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

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2007 Alfalfa Insecticide Evaluation,

Stillwater EFAW Research Station, Stillwater. OK.

Mean Number AW Larvae / 25 Stems

	Rate/ Lbs a.i./A	3DAT*	7DAT*	14DAT*	21DAT*	27DAT*	36DAT*	Average ** % Control	Yield * Lbs/A
1.) GF-1846	0.372	4 e	4.5 d	3.0 d	2.8 cd	1.3 f	1.0 efg	90	6401 ab
2.) GF-1846	0.567	2.5 f	8.0 cd	1.8 d	0.8 e	2.3 ef	1.8 defg	89	5980 abc
3.) Baythroid XL	0.0188	8.25 def	6.8 d	4.0 d	2.8 cd	2.0 ef	1.0 efg	86	5066 c
4.)Baythroid XL + Lorsban 4E	0.0165 + 0.25	6.25 def	7.5 cd	30.8 bcd	2.5 cd	2.5 ef	2.8 defg	69	4952 c
5.) Lorsban 4E	1.0	7.5 def	6.8 d	14.8 bcd	11.3cde	10.8 bcd	4.5 cdefg	60	5233 bc
6.) LAF-1	1.0	4.5 ef	9.3 cd	12.3 bcd	13.5cd	9.3 cde	7.0 bcd	58	6142 abc
7.) GF-2020	1.0	4.25 ef	10.3 cd	12.5 bcd	14.5 cd	10.8 bcd	3.3 cdefg	63	5326 bc
8.) Mustang-Max	0.025	11.0 cd	10.5 cd	3.8 d	4.3 cd	1.5 f	0.0 g	86	5561 abc
9.) F-6113	0.049	6.75 def	4.8 d	2.8 d	2.0 d	1.0 f	0.5 efg	91	6107 abc
10.) Warrior (Early Stubble)	0.03	3.5 ef	5.3 d	3.8 d	6.8 cd	5.8 def	5.8 bcde	74	5496 abc
11.) Warrior (Late Stubble)	0.03	4.5 ef	3.8 d	2.0 d	1.8 d	1.3 f	0.8 efg	92	6663 a
12.) Warrior (Threshold)	0.03	9.0 de	18.8 c	9.8 bcd	2.3 cd	0.5 f	0.3 fg	83	5699 abc
13.) Furadan 4F	0.75	2.25 f	5.8 d	8.5 bcd	13.5 cd	7.8 cdef	5.5 cdef	68	5309 bc
14.) DPX-261	0.066	15.75 c	36.5 b	59.8 a	33.3 ab	13.8 bc	11.0 b	-2	4968 c
15.) DPX-261	0.1	24.0 b	40.5 b	64.8 a	39.8 a	22.5 a	18.3 a	-36	4862 c
16.) Untreated		36.25 a	71.0 a	31.8 b	28.0 ab	17.0 ab	8.5 bc		3013 d

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).

** Average % control calculated from 3DAT to 36DAT. (threshold).

DAT= Days after treatment. First sample date was 3 days after threshold treatment (3-17-07). Pre-treatment sampled (3-14-07)(Threshold).

2007 Alfalfa Insecticide Evaluation,

Stillwater EFAW Research Station, Stillwater. OK.

Mean Number PAA / 25 Stems

	Rate/ Lbs a.i./A	3DAT*	7DAT*	14DAT*	21DAT*	27DAT*	36DAT*	Average ** % Control
1.) GF-1846	0.372	0	0	4.3 b	22.8 ab	33.8 bc	31.8 b	35
2.) GF-1846	0.567	0	0	2.8 b	19.5 b	28.0 c	30.3 b	43
3.) Baythroid XL	0.0188	0	0	3.5 b	25.3 ab	34.0 bc	47.5 ab	20
4.) Baythroid XL + Lorsban 4E	0.0165 + 0.25	0	0	7.3 b	42.3 ab	27.3 c	44.5 ab	11
5.) Lorsban 4E	1.0	0	0	9.8 b	29.5 ab	22.0 c	41.0 ab	22
6.) LAF-1	1.0	0	0	3.0 b	24.3 ab	24.3 c	20.5 b	50
7.) GF-2020	1.0	0	0	2.5 b	22.5 ab	27.0 c	25.8 b	44
8.) Mustang-Max	0.025	0	0	2.3 b	32.0 ab	30.8 c	46.0 ab	18
9.) F-6113	0.049	0	0	3.8 b	23.3 ab	30.5 c	75.0 a	-2
10.) Warrior (Early Stubble)	0.03	0	0	9.8 b	28.5 ab	30.8 c	51.8 ab	-8
11.) Warrior (Late Stubble)	0.03	0	0	5.8 b	20.0 b	32.8 bc	27.8 b	39
12.) Warrior (Threshold)	0.03	0	0	5.0 n	18.0 b	26.8 c	39.3 ab	34
13.) Furadan 4F	0.75	0	0	2.5 b	19.8 b	32.8 bc	27.5 b	43
14.) DPX-261	0.066	0	0	8.5 b	29.0 a	66.0 ab	34.0 b	8
15.) DPX-261	0.1	0	0	10.3 b	52.8 a	75.0 a	25.8 b	-6
16.) Untreated		0	0	21.5 a	39.3 a	50.3 abc	27.8 b	

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).
** Average % control calculated from 3DAT to 36DAT. (threshold).
DAT= Days after treatment. First sample date was 3 days after threshold treatment (3-17-07). Pre-treatment sampled (3-14-07)(Threshold).

2007 Alfalfa Insecticide Evaluation,

Stillwater EFAW Research Station, Stillwater. OK.

Mean Number BAA / 25 Stems

	Rate/ Lbs a.i./A	3DAT*	7DAT*	14DAT*	21DAT*	27DAT*	36DAT*	Average ** % Control
1.) GF-1846	0.372	0 b	0.0 b	4.8 b	143.8 b	68.8 c	62.3 cd	77
2.) GF-1846	0.567	0 b	.3 b	4.3 b	95.2 b	34.5 c	36.3 cd	85
3.) Baythroid XL	0.0188	0 b	.8 b	5.5 b	25.0 b	42..0 c	75.3 d	81
4.) Baythroid XL + Lorsban 4E	0.0165 + 0.25	0 b	.3 b	4.3 b	40.5 b	47.5 c	133.8 abcd	75
5.) Lorsban 4E	1.0	.3 b	1.3 b	7.0 b	29.8 b	46.5 c	80.2 bcd	77
6.) LAF-1	1.0	0 b	0.0 b	8.3 b	37.0 b	28.0 c	37.3 d	89
7.) GF-2020	1.0	0 b	1.5 b	7.3 b	32.3 b	41.3 c	50.5 cd	79
8.) Mustang-Max	0.025	0 b	0.0 b	7.3 b	29.3 b	48.8 c	97.5 bcd	81
9.) F-6113	0.049	0 b	0.0 b	5.5 b	31.8 b	31.5 c	74.0 cd	85
10.) Warrior (Early Stubble)	0.03	0 b	.5 b	12.5 b	22.3 b	55.0 c	81.0 bcd	80
11.) Warrior (Late Stubble)	0.03	0 b	1.3 b	.8 b	23.0 b	40.3 c	34.3 d	85
12.) Warrior (Threshold)	0.03	0 b	.3 b	2.0 b	23.5 b	25.5 c	50.3 cd	88
13.) Furadan 4F	0.75	.3 b	1.3 b	8.3 b	20.3 b	128.8 ab	107.5 bcd	68
14.) DPX-261	0.066	.3 b	3.3 b	43.3 b	72.5 b	180.3 abc	170.8 ab	39
15.) DPX-261	0.1	0 b	12.5 a	109.0 a	84.0 b	265.5 a	205.8 a	-27
16.) Untreated		11.0 a	4.5 b	149.5 a	345.8 a	249.8 ab	161.5 ab	

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).
** Average % control calculated from 3DAT to 36DAT. (threshold).
DAT= Days after treatment. First sample date was 3 days after threshold treatment (3-17-07). Pre-treatment sampled (3-14-07)(Threshold).

2007 Alfalfa Insecticide Evaluation,

Stillwater EFAW Research Station, Stillwater. OK.

Mean Number SAA / 25 Stems

	Rate/ Lbs a.i./A	3DAT*	7DAT*	14DAT*	21DAT*	27DAT*	36DAT*	Average ** % Control
1.) GF-1846	0.372	0.0 a	0.0 b	0.0 c	0.0 b	0.0 b	.5 a	
2.) GF-1846	0.567	0.0 a	0.0 b	0.0 c	0.0 b	0.0 b	0.0 b	
3.) Baythroid XL	0.0188	0.0 a	0.0 b	0.0 c	0.0 b	.3 b	.3 ab	
4.) Baythroid XL + Lorsban 4E	0.0165 + 0.25	.3 a	0.0 b	0.0 c	0.0 b	2.5 a	0.0 b	
5.) Lorsban 4E	1.0	0.0 a	0.0 b	0.0 c	0.0 b	0.0 b	.3 ab	
6.) LAF-1	1.0	.3 a	0.0 b	0.0 c	0.0 b	0.0 b	0.0 b	
7.) GF-2020	1.0	0.0 a	0.0 b	0.0 c	0.0 b	.3 b	.3 ab	
8.) Mustang-Max	0.025	.3 a	0.0 b	.3 c	0.0 b	0.0 b	0.0 b	
9.) F-6113	0.049	.3 a	0.0 b	0.0 c	0.0 b	0.0 b	0.0 b	
10.) Warrior (Early Stubble)	0.03	0.0 a	0.0 b	0.0 c	0.0 b	0.0 b	0.0 b	
11.) Warrior (Late Stubble)	0.03	0.0 a	0.0 b	0.0 c	0.0 b	0.0 b	0.0 b	
12.) Warrior (Threshold)	0.03	.3 a	0.0 b	1.3 ab	0.0 b	0.0 b	.3 ab	
13.) Furadan 4F	0.75	0.0 a	.5 a	1.0 bc	0.0 b	0.0 b	.3 ab	
14.) DPX-261	0.066	0.0 a	.5 a	2.5 a	0.0 b	0.0 b	.3 ab	
15.) DPX-261	0.1	.5 a	.3 a	.5 b	.3 a	0.0 b	.3 ab	
16.) Untreated		.3 a	.3 a	0.0 c	0.0 b	.8 ab	.3 ab	

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).
** Average % control calculated from 3DAT to 36DAT. (threshold).
DAT= Days after treatment. First sample date was 3 days after threshold treatment (3-17-07). Pre-treatment sampled (3-14-07)(Threshold).

2007 Alfalfa Insecticide Evaluation,

Stillwater EFAW Research Station, Stillwater. OK.

Mean Number CPA / 25 Stems

	Rate/ Lbs a.i./A	3DAT*	7DAT*	14DAT*	21DAT*	27DAT*	36DAT*	Average ** % Control
1.) GF-1846	0.372	0.0 b	.3 b	.3 b	1.0 b	1.0 b	1.0 b	
2.) GF-1846	0.567	0.0 b	0.0 b	0.0 b	.3 b	0.0 c	1.5 b	
3.) Baythroid XL	0.0188	.5 b	.3 b	.8 b	1.8 b	.5 b	0.0 b	
4.) Baythroid XL + Lorsban 4E	0.0165 + 0.25	0.0 b	.3 b	1.3 b	.8 b	.3 b	.5 b	
5.) Lorsban 4E	1.0	0.0 b	0 b	0.0 b	.5 b	.5 b	.5 b	
6.) LAF-1	1.0	.5 b	0.0 b	1.0 b	.3 b	0.0 c	0.0 b	
7.) GF-2020	1.0	0.0 b	0.0 b	0.0 b	.5 b	.5 b	0.0 b	
8.) Mustang-Max	0.025	0.0 b	.3 b	0.0 b	0.0 b	.5 b	1.8 b	
9.) F-6113	0.049	0.0 b	0.0 b	0.0 b	2.5 b	3.0 abc	3.0 ab	
10.) Warrior (Early Stubble)	0.03	0.0 b	0.0 b	0.0 b	.3 b	2.0 ab	7.8 a	
11.) Warrior (Late Stubble)	0.03	0.0 b	0.0 b	0.0 b	0.0 b	.3 b	0.0 b	
12.) Warrior (Threshold)	0.03	0.0 b	.3 b	0.0 b	.3 b	.3 b	0.0 b	
13.) Furadan 4F	0.75	0.0 b	0.0 b	.3 b	0.0 b	3.3 ab	1.3 b	
14.) DPX-261	0.066	.3 b	.8 b	3.5 ab	0.0 b	1.3 b	1.5 b	
15.) DPX-261	0.1	.5 b	2.3 a	2.0 b	6.0 a	4.8 a	2.3 ab	
16.) Untreated		.5 a	1.3 a	6.8 a	2.8 ab	1.8 ab	1.0 b	

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).
** Average % control calculated from 3DAT to 36DAT. (threshold).
DAT= Days after treatment. First sample date was 3 days after threshold treatment (3-17-07). Pre-treatment sampled (3-14-07)(Threshold).

2007 Alfalfa Insecticide Evaluation,

Stillwater EFAW Research Station, Stillwater. OK.

Mean Number Total Aphid / 25 Stems

	Rate/ Lbs a.i./A	3DAT*	7DAT*	14DAT*	21DAT*	27DAT*	36DAT*	Average ** % Control
1.) GF-1846	0.372	0.0 b	.8 c	9.3 c	51.0 b	103.5 cd	93.3 cde	81
2.) GF-1846	0.567	0.0 b	0.0 c	7.0 c	38.3 b	62.5 d	64.5 e	88
3.) Baythroid XL	0.0188	.5 b	.8 c	9.8 c	49.3 b	76.5 d	123.0 abcde	79
4.) Baythroid XL + Lorsban 4E	0.0165 + 0.25	.3 b	.5 c	13.0 c	73.5 b	73.0 d	191.3 abcde	73
5.) Lorsban 4E	1.0	.3 b	.3 c	16.8 c	68.0 b	69.0 d	121.5 abcde	79
6.) LAF-1	1.0	.8 b	1.3 c	12.3 c	56.0 b	52.5 d	57.8 e	85
7.) GF-2020	1.0	0.0 b	0.0 c	9.8 c	56.8 b	69.0 d	76.5 de	85
8.) Mustang-Max	0.025	.3 b	3.3 c	9.5 c	50.3 b	80.0 d	144.0 abcde	73
9.) F-6113	0.049	.3 b	.3 c	9.5 c	49.3 b	35.0 d	111.3 bcde	84
10.) Warrior (Early Stubble)	0.03	0.0 b	0.0 c	22.3 c	60.8 b	88.0 cd	140.8 abcde	77
11.) Warrior (Late Stubble)	0.03	0.0 b	.5 c	6.5 c	30.5 b	75.8 d	62.0 e	87
12.) Warrior (Threshold)	0.03	.3 b	1.3 c	7.0 c	47.5 b	52.5 d	87.5 cde	83
13.) Furadan 4F	0.75	.3 b	.3 c	12.0 c	89.5 b	164.8 bcd	136.8 abcde	72
14.) DPX-261	0.066	.5 b	5.0 abc	55.5 bc	321.5 a	246.8 abc	209.0 ab	39
15.) DPX-261	0.1	1.0 b	12.3 a	125.3 ab	372.85 a	345.3 a	231.8 a	9.5
16.) Untreated		12.8 a	9.8 ab	177.8 a	407.8 a	277.5 ab	186.8 abcd	

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).
** Average % control calculated from 3DAT to 36DAT. (threshold).
DAT= Days after treatment. First sample date was 3 days after threshold treatment (3-17-07). Pre-treatment sampled (3-14-07)(Threshold).

Mean Number /25 stems
(Early Stubble)

Treatment/ Formulation	Rate/ Lbs. AI/acre	Larvae		PA**		BAA**		SAA**		CPA**		Total Aphids	
		6DAT*	14DAT*	6DAT*	14DAT*	6DAT*	14 DAT*	6DAT*	14DAT*	6DAT*	14DAT*	6DAT*	14DAT*
Warrior 1 EC Stubble	0.03	3.0 a	2.3 b	0.0 a	0.0	0.0	0.0 a	.3 a	0.0 a	.8 a	0.3 a	1.0 a	.3 a
Untreated		18.8 a	23.5 a	.3 a	0.0	0.0	0.8 a	.3 a	0.3 a	1.8 a	1.8 a	2.3 a	2.3 a

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).
** PA=Pea Aphid. BAA=Blue Alfalfa Aphid. SAA=Spotted Alfalfa Aphid. CPA=Cow Pea Aphid.
DAT= Days After Treatment. Early stubble application date was 21 days prior to threshold treatment (2-21-07).

Mean Number /25 stems
(Late Stubble)

Treatment/ Formulation	Rate/ lbs AI/acre	Larvae		PA**		BAA**		SAA**		CPA**		Total Aphids	
		3DAT*	7DAT*	3DAT*	7DAT*	3DAT*	7 DAT*	3DAT*	7DAT*	3DAT*	7DAT*	3DAT*	7DAT*
Warrior 1 EC Stubble	0.03	6.3 b	2.5 b	0.0	0.0 a	.8 a	0.0 a	0.0 a	0.0 a	1.5 a	0.0 a	2.3 a	0.0 b
Untreated		14.3 a	32.8 a	0.0	.3 a	.5 a	4.3 a	.5 a	1.0 a	2.0 a	1.3 a	3.3 a	4.0 a

* Means within columns, followed by the same letter are not significantly different (ANOVA LSD; P=0.05).
** PA=Pea Aphid. BAA=Blue Alfalfa Aphid. SAA=Spotted Alfalfa Aphid. CPA=Cow Pea Aphid.
DAT= Days After Treatment. Late stubble application date was 9 days prior to threshold treatment (3-5-07)