

Section III
Field Crop Pests

2009 VALENT SPRING WHEAT TRIALS – NIPSIT™

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Protocol. Valent USA desired experimental design to test their new Clothianidin seed treatment (Nipsit TM) against insect pests that reduce yield in spring wheat. Treatments included and untreated check (UTC)(Treatment A); a Raxil Allegiance fungicide only (B); RA + Gaucho 600FS (C)at 31 gmai/hkg; Cruiser 5FS + Dividend Apron(D)at 0.29 gmai/hkg;V-10256 at 3.25 gmai/hkg (E); V-10257 (F)at 13.250 gmai/hkg; V-10256 (G)at 4.875 gmai/hkg; V-10257(H)at 19.875 gmai/hkg; V-10256 (I)at 6.5 gmai/hkg; V-10257 (J) at 26.500 gmai/hkg; V-10251 (K) at 14.500 gmai/hkg; and V-10257+V-10212 (L)at 13.250 and 22.00 gmai/hkg.

A RCB Plot Design with 4 replications of each treatment was used with 4 x 20 feet. Seeding was done with a Hegi Cone Seeder on May 21, 2009. Data was collected for insect damage and numbers three times during the season up to soft dough. *Fusarium culmorum* varied at this stage and data for white heads was collected. Cereal Leaf Beetle Larvae(*Oulema melanoplus*) were counted. As were Russian Wheat Aphid (*Diuraphis noxia*) and the predatory Ladybird Beetle *Hippodamia convergens*. *H. convergens* is a major predator of CLB, reducing larval populations by 40%. *H. convergens* remained on the wheat through hard dough stage, still eating CLB larvae up to 2nd instar in size.

Statistics were run for each experiment using AOV and LSD tests for SD. Grain was harvested August 17, 2009 using a plot combine.

Experiment I.

LSD All-Pairwise Comparisons Test for wire worm in DNS Wheat Stand at 10 DPE

Treatment	GMAI/HKG	Mean wheat plants ¼ meter square
E V-10256	3.25	31.500 A
L V-10257/V-10212	13.25/22.00	31.000 A
H V-10257	19.875	30.000 A
G V-10256	4.875	29.750 A
D Cruiser /Dividend/Apron	29.00/12.00/3.00	29.500 A
J V-10257	26.50	29.500 A
I V-10256	6.50	29.000 B
C Gaucho 600/Raxil/Allegiance	31.00/2.00/1.50	28.000 C
F V10257	13.25	27.500 D
K V10251	14.50	26.000 E
A UTC	----	21.000 F
B Raxil/Allegiance	1.59/2.00	19.750 F

Alpha 0.05; Standard Error for Comparison 1.0639; Critical T Value 2.028; Critical Value for Comparison 2.1577. There are 6 groups (A, B, etc.) in which the means are not significantly different from one another.

Comments. For wire worm plant stand all treatments are SD the Fungicide only and the UTC in Group F. I see the lower rate of V10256 equal to all treatments in the Group A to E. For early season stand protection this low Chlothianidin rate is adequate. Stand is not increased over the UTC by Raxil-Allegiance for Pythium. All insecticides increased plant stand by 5plants per ¼ square meter indicating wire worm as a factor in stand reduction.

Experiment II. 2009 Valent Spring Wheat Fusarium Heads per Square Meter at soft dough

LSD All-Pairwise Comparisons Test for Fusarium white heads

Treatment	GMAI/HKG	Mean White Heads	per square meter
E V-10256	3.25	17.00	A
A UTC	----	13.00	B
G V-10256	4.875	11.25	BC
B Raxil-Allegiance	1.50/2.00	10.75	C
C Gaucho 600/Allegiance/Raxil	31.00/2.00/1.50	10.75	C
H V-10257	19.875	10.50	C
F V-10257	13.25	10.25	C
I V-10256	6.50	9.25	D
J V-10257	26.50	7.50	D
D Cruiser/Dividend/Apron	29.00/12.00/3.00	7.25	E
K V-10251	14.50	5.25	F
L V-10257/V-10212	13.25/22.00	5.25	F

Alpha 0.1; Standard Error for Comparison 2.0207; Critical T Value 1.688; Critical Value for Comparison 3.4116. There are 6 groups (A, B, etc.) in which the means are not significantly different from one another.

Comments. In this experiment measurement of white tops expressing *Fusarium*, all other causes were selectively eliminated. The statistics reflect the counts. There is a trend for the fungicide treatments to reduce WH below the insecticide treatments. Treatments J, D, K, and L were SD the others indicating real fungicide activity to *Fusarium* Dryland Foot Rot. More research is needed.

Experiment III.

LSD All-Pairwise Comparisons Test CLB larvae and eggs at jointing June 4, 2009

Treatment	GMAI/HKG	Mean CLB per 10 plants
E V-10256	3.25	20.25 A
A UTC	----	20.00 A
B Raxil-Allegiance	1.50/2.00	19.75 A
G V-10256	4.875	19.25 A
F V-10257	13.25	19.00 A
I V-10256	6.50	5.00 B
J V-10257	26.25	4.75 B
H V-10256	6.50	4.25 C
L V-100257/V-10212	13.25/22.00	1.75 D
K V-10251	14.50	1.50 D
C Gaucho 600 F + RA	31.00/1.50/2.00	0.00 E
D Cruiser-Dividend-Apron	29.00/12.00/3.00	0.00 E

Alpha 0.05; Standard Error for Comparison 0.5713; Critical T Value 2.028; Critical Value for Comparison 1.1587. There are 5 groups (A, B, etc.) in which the means are not significantly different from one another.

Comments. The Western Regional Cereal Leaf Beetle Team has determined that 2 larvae and one adult per plant at the seedling through jointing stage are causing economic injury to the plants. The mean per plant is 2.0 for the UTC etc. in A. Good early CLB management occurred in Groups I, J, H, L, K, C, and D. Scrutinize the lower insecticide rates as CLB at jointing are crucial to plant health and affect yield. Fungicides don't affect CLB w/o an insecticide treatment added.

Experiment IV. Russian Wheat Aphid Plants per ¼ meter June 4, 2009

LSD All-Pairwise Comparisons Test for RWA at jointing stage

Treatment	GMAI/HKG	Mean RWA
B Raxil/Allegiance	2.00/1.50	37.25 A
A UTC	----	32.75 A
I V-10256	6.50	22.50 A above threshold
K V-10251	14.50	13.25 B
L V-10257	13.25/22.00	11.00 C
E V-10256	3.25	10.00 C
G V-10256	4.875	8.75 C
J V-10257	26.50	8.25 C
D Cruiser/Dividend/Apron	29.00/12.00/3.00	4.25 D
F V-10257	13.25	4.25 D
C Gaucho 600/Raxil/Allegiance	31.00/1.5/2.00	1.00 E
H V-10257	19.875	0.00 E

Alpha 0.05; Standard Error for Comparison 2.9017; Critical T Value 2.028; Critical Value for Comparison 5.8850. There are 6 groups (A, B, etc.) in which the means are not significantly different from one another. It is generally accepted that the economic injury threshold for spring wheat is around 16% infestation at the jointing stage. Treatments A, B, and I had RWA levels above this level, which could affect plant vigor prior to grain fill.

Comments. RWA were above economic threshold at jointing in Treatments A, B, and I. WSU Extension has decided that 16% infestation with just 1 aphid per plant is economic at this stage. Other treatments are SD for aphid.

Experiment V.

LSD All-Pairwise Comparisons Test for Cereal Leaf Beetle at jointing on June 4, 2009

Treatment	GMAI/HKG	Mean CLB Larvae 10 plants
B Raxil/Allegiance	1.50/2.00	26.25 A
A UTC	----	22.25 AB
G V-10256	4.875	19.75 B
F V-10256	13.25	19.50 B
I V-10256	6.50	16.50 C
E V-10256	3.25	13.75 D
J V-10257	26.50	7.00 E
K V-10251	14.50	5.50 E
L V-10257/V-10202	13.25/22.00	4.25 E
H V-10257	19.875	3.25 E
C Gaucho 600/Raxil/Allegiance	31.00/1.50/2.00	0.26 F
D Cruiser/Dividend/Apron	29.00/12.00/3.00	0.01 F

Alpha 0.05; Standard Error for Comparison 2.3221; Critical T Value 2.028; Critical Value for Comparison 4.7094. There are 6 groups (A, B, etc.) in which the means are not significantly different from one another. Treatments C & D had no CLB larvae at this early date.

Comments. B,G,A, and F are above the 2 larvae per plant threshold at jointing stage. Treatments C, D, E, and F reduced the CLB population below economic injury level with C and D at almost total CLB management.

Experiment VI. Adult *Hippodamia convergens* on June 4, 2009

LSD All-Pairwise Comparisons Test adult *Hippodamia convergens* June 4, 2009

Treatment	GMAI/HKG	Mean <i>Hippodamia convergens</i>
A UTC	----	2.25 A
B Raxil/Allegiance	1.50/2.00	2.00 A
E V-10256	3.25	2.00 A
H V-10257	19.875	1.75 B
L V-10257/V-10212	13.25/22.00	1.75 B
G V-10256	4.875	1.50 B
J V-10257	26.50	1.50 B
K V-10251	14.50	1.50 B
F V-10257	13.25	1.25 B
I V-10256	6.50	1.00 C
C Gaucho 600/Raxil/Allegiance	31.00/1.50/2.00	0.00 D
D Cruiser/Dividend/Apron	29.00/12.00/3.00	0.00 D

Alpha 0.05; Standard Error for Comparison 0.4410; Critical T Value 2.028; Critical Value for Comparison 0.8943. There are 4 groups (A, B, etc.) in which the means are not significantly different from one another. Note the absence of H.c. in Gaucho and Cruiser treatments. May be due to lack of prey?

Comments. This jointing stage of wheat shows the earliest populations of adult ladybird beetles in 3 years. At seedling/jointing ladybird beetles are the number one biological control for reducing CLB and RWA populations below economic thresholds. Treatments that either repel or injure ladybird beetles are a factor in overall pest management in cereal trials. Treatments C and D had no ladybird beetles at the seedling/jointing stage which is most vulnerable to damage by pest insects. At 20 DAP, *H. convergens* was uniform in all treatments and continued as such through soft dough stage.

Experiment VII. 2009 Valent Spring Wheat Yield

LSD All-Pairwise Comparisons Test for wheat yield in grams per square meter

Treatment	GMAI/HKG	Mean grams per square meter
L V-10257/10-10212	13.25/22.00	614.25 A
I V-10256	6.50	607.25 A
K V-10251	14.50	586.00 A
J V-10257	26.50	582.00 A
E V-10256	3.25	568.00 A
D Cruiser/Dividend/Apron	29.00/12.00/3.00	548.00 B
H V-10257	19.875	547.75 B
F V-10257	13.25	545.75 B
C Gaucho 600/Raxil/Allegiance	31.00/1.50/2.00	544.50 B
G V-10256	4.875	467.50 C
B Raxil/Allegiance	1.50/2.00	428.00 D
A UTC	----	365.25 D

Alpha 0.1; Standard Error for Comparison 49.381; Critical T Value 1.688; Critical Value for Comparison 83.369. There are 4 groups (A, B, etc.) in which the means are not significantly different from one another.

Comments. Treatment followed by A at harvest were SD B,C, and D. Heavy rain for 3 days in mid-July caused sucker heads to fill. These extra heads did not thresh out and resulted in poor quality and a lot of spill at threshing. The better treatments based on heads with grain turned out poorly for quality and yield. However, the better insect management treatments had the best yields.

General Comments. Early CLB and RWA populations at seedling/jointing were the most important factors after stand establishment in this trial. A combination of wire worm and Pythium affected stand overall. Fusarium heads probably did not affect yield but were demonstrably reduced by some fungicide treatments. Rain in July was a yield reducing factor in DNS.