

**MANAGEMENT OF WIRE WORM
(COLEOPTERA:ELATERIDAE)
USING SEED TREATMENT
PRODUCTS**

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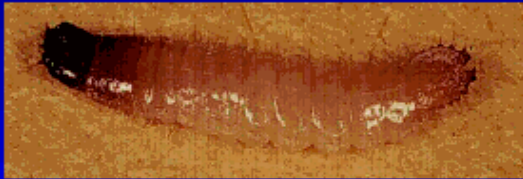


Replicate showing wire worm damage to stand



Wire worm damage under field conditions in early spring

Wireworm larvae



**Adult “Click” Beetle
Limonius canus Basin Wire
Worm**



Large false wireworm larvae Photo: QDPI



False wire worm adult

Eleodes hisperlabrus

WIRE WORM STUDIES IN FALL SEEDED WHEAT 2002-2003

- RBCD 4 x 10 x 30
- 10 treatments seeded 9-23-02 Hegi Cone Seeder
- Seeded into sweet corn residue with *Limonius canus* larvae present
- Plant stand per 13/m² counted 3 DPE
- Harvest 8-20-2003 Winter-Steiger plot combine
- *Some variable BYDV symptoms noted = Lindane does not provide aphid protection = yield loss.
- AOV;LSD t Test 0.05 = numbers followed by same letter are NSD.

2003 Winter Wheat Wire Worm Trial Results

<u>Treatment</u>	<u>Rate/CWT</u>	<u>Stand</u>	<u>Yield Bu/AC</u>
Poncho	0.10	13.1b	115.6a
Gaucho 480	1.00	13.8b	115.3a
Cruiser	0.80	13.2b	112.7a
Poncho	0.80	13.8b	112.5a
Poncho	0.13	13.7b	107.9b
Gaucho 480	0.16	12.8bc	104.7b
Gaucho 480	0.24	12.6bc	104.4b
Cruiser	0.19	13.3b	104.4b
RMD only	5.00	10.9d	101.0c
Lindane	1.00	12.2bc	76.3d*

Total moisture for 2002-2003 17 inches ppt. & irrigation combined.

*BCOA vectoring BYDV was main yield factor.

Note plant stand differences for wire worm activity in crop cycle.

2004 SEED TREATMENT SPRING WHEAT TRIAL

- Fall seeded SWWW 2003 “failed” – reseeded to SWSW 2004
- Seeded 4-7-2004 with Hegi Cone Seeder plot drill at CFRF in RCBD x 4 replicates 8 x 20 feet with 6 treatments inc. UTC (RXT)
- All treatments with RXT at 5 fl oz/cwt.
- Variety “Alpowa” has no resistance to any insect pest
- Plant stand counts 18” row 10 DPE
- Russian wheat aphid counts of 5 infested tillers 48 DPE (anthesis)
- Harvested 7-22-04 using Winter-Steiger Plot Combine
- Total moisture for trial was 17” by ppt. and irrigation
- AOV;LSD t Test 0.05

2004 SWSW Trial Results

<u>Treatment</u>	<u>Rate/Cwt</u>	<u>RWA%</u>	<u>Stand</u>	<u>Bu/Ac</u>
Poncho 600	0.20	0.25c	16.0a	79.8a
Poncho 600	0.10	0.50c	15.5a	79.7a
<u>Gaucho 480</u>	<u>0.32</u>	<u>1.00c</u>	<u>14.0a</u>	<u>75.8b</u>
Gaucho 480	0.16	2.50b	11.0b	67.9c
Cruiser	0.19	2.50b	10.8b	69.7c
RMD only	5.00	18.50a	9.0c	67.4c

AOV; LSD t Test $p = 0.5$ – numbers followed by same letter NSD.

Plant stand was major factor in yield reduction in this trial = wire worm damage. RWA flight too late to impact yield.

2004-2005 Winter Wheat Trial

- Rod/Madsen 50/50 seeded 10-11-2004 = dry fall
- 7 treatments seeded in RCBD 4 replicates of 10 x 20 feet
- Seeded with Hegi Cone Seeder 60 lbs acre equivalent
- All treatments treated with RXT 0.16 fl oz cwt plus Evershield Protectant at 0.15 fl oz cwt
- Cold, dry winter with only snow in county on trial site
- Emergence variable prior to moisture so stand count made 202 DPE on 4-8-05
- Anthesis occurred May 26 = 220 DPE – BYDV evaluated as 34.5% in RXT check only = all insecticides effective against BCOA
- Harvested 281 DPE by Winter Steiger plot Combine
- Some sucker tillers filled with July rains = increased yield
- Total moisture for crop cycle 9/1 to harvest = 17 inches including rainfall and irrigation

2005 SWWW TRIAL RESULTS

<u>Treatment</u>	<u>Rate/Cwt</u>	<u>Plant Stand</u>	<u>Yield Bu/Ac</u>
Gaucho 480	1.50	10.8a	126.0a
Gaucho 480	1.00	10.3a	121.8a
Poncho 600	0.77	12.8a	119.8a
Poncho 600	0.52	12.0a	113.8a
Cruiser	0.80	12.3a	107.0b
Poncho 600	0.26	11.8a	104.0b
RXT	0.16	6.9b	94.3c

AOV;LSD t Test 0.10

Numbers followed by same letter NSD.

Ca. 50% stand reduction in RXT check compared to other treatments due to wire worm damage.

2005 SWSW Trial

- RCBD with 11 treatments x 4 replicates 4 x 16 feet each
- Variety “Alpowa” seeded by Hegi Cone Seeder 60lbs acre equivalent on 7 inch spacing
- Seeding date 5-13-05 Emergence 5-20-05
- Plant stand count on 5-26-05 = 6 DPE 1.5 feet row also recounted 6-28-05 no change in stand
- Harvested by Winter Steiger Plot Combine 8-15-05
- Total moisture for trial was 13.5 inches including rainfall and supplemental irrigation
- AOV;LSD t Test 0.10
- Test weight was 60 lbs per bushel

2005 Spring Wheat Trial Results

<u>Treatment</u>	<u>Rate/CWT</u>	<u>Stand</u>	<u>Bu/Ac</u>
Poncho 600	0.80	15.3a	43.4a
GaUCHo 480	1.00	13.0b	43.1a
Cruiser	0.80	12.3c	42.3b
Poncho 600	0.20	14.8a	40.2b
Poncho 600	0.10	12.8b	39.9b
GaUCHo 480	0.32	11.3c	39.9b
GaUCHo 480	0.16	10.5d	37.8c
<u>Lindane</u>	<u>1.00</u>	<u>12.5b</u>	<u>32.9d</u>
DE	1.00	8.5d	32.0d
RXT	0.16	9.6d	27.3d
UTC	-----	8.5d	25.8e

AOV:LSD t Test 0.10

Note: stand differences relate to wire worm activity at early plant growth
All treatments with RXT except UTC

SPRING WHEAT TRIAL COMPARING CRUISER AND GAUCHO 480 FIELD RATES

Much discussion about what rates of Gaucho 480 and Cruiser should be used has been had over recent years so a trial using “Alpowa” SWSW was seeded with 8 treatments of 4 replicates of 4 x 16 feet.

- Seeding by Hegi Cone Seeder in 7 inch row spacing = 60 lbs per acre . Seeded 5-13-2005.
- Moisture was lower than for other spring wheat trials - at 11.5 inches including rain fall and irrigation. Hence lower than typical yields.
- Harvest data collected by Winter Steiger Plot Combine on 7-23-05.

Results in plant stand and yield for comparison trial

<u>Treatment</u>	<u>Rate</u>	<u>Stand</u>	<u>RWA%</u>	<u>Bu/Ac</u>
Gaicho 480	<u>0.35</u>	14.3	5.3a	35.0a
Cruiser	<u>0.35</u>	16.1	5.3a	34.6a
Cruiser	0.19	13.5	<u>33.5b</u>	32.2b
<u>Gaicho 480</u>	<u>0.16</u>	<u>14.6</u>	<u>34.6c</u>	<u>25.6b</u>
RXT only	0.16	14.6	100.0c	24.0c
DE only	1.00	12.8	100.0c	27.6b
UTC	-----	12.8	100.0c	21.1d

AOV;LSD t Test 0.10 Yield CV = 17.6 RWA % CV = 1.78 Stand CV = 12.7
 ¥ 35 bu/ac was a very good yield for swsw in 2005.

Conclusions of Comparison Trial for Gaucho and Cruiser Rates

- 1 Wire worm were present at seeding but high CV for WW indicates they were not a major factor in plant stand density (1/4 Meter row).
- 2 Based on Russian Wheat Aphid % infested tillers and resulting yield data the rates of Gaucho 480 (600) and Cruiser compare on a rate basis as usual.
- 3 Trend is to use ca. 0.30 fl oz/cwt for both products for similar cost and efficacy.
- 4 Yield results for all trials show the need for a seed treatment insecticide. Poncho 600 (Chlothianidin) is still under rate specific trial study and shows promise for registration soon.