Corn Rootworm Management Products
Standard Efficacy Trial; Small Plot Assays
December 2014

TEST 1 of 2

Location: Throckmorton-Purdue Agricultural Center, 8342 US231 South, Lafayette, IN 47909.

GPS coordinates: 40.300431, -86.900737

Cooperator: Christian Krupke/Larry Bledsoe, Department of Entomology, Purdue University

Planting date: 5/28/2014

Base Hybrid; DKC61-79 RR2 Acceleron 250mg/kernel

Row width: 30"

Planter Population: 27,700 kernels per acre

Soil Type: Mellott loam

Soil Properties:

CEC: 12.4	Mg lbs/ac 474
Organic matter; 1.7%	Ca Sat'n 53%
pH; 5.0	Mg Sat'n 16%
Lime index 67	K Sat'n 3%
P lbs/ac 58	Base Sat'n 71%
K lbs/ac 257	Ca/Mg 3.3
Ca lbs/ac 2612	Mg/K 6.0

Texture: 43.6% sand, 38.4% silt, 18.0% clay

Tillage: 4/24 disk, 5/2 field cultivator, 5/5 field cultivator.

Conditions at planting:
air temp; 78°F 4" soil temp 79°F; wind dir and spd. NE 4-8

Previous crop: corn

Previous year soil insecticide: none

Herbicide: 5/5 Lexar 3.0 qt/a; 6/19 Capreno 3 oz/a, Moxy 6 oz/a, Choice Weather Master 3 pt/100 ga, COC 1gal/100 gal.

Fertilizer: 5/5 28% UAN, 57 gal/a (170 units N);
5/28 starter, 12-12-12 113 lbs/a

Weather data: see Appendix I.

Methods:
Randomized complete block design, 4 replicates, single row plots x 100 ft, John Deere® Max-emerge® 7000 planter. Modified Noble® meters were used to apply granular insecticides. All applications were made at 3 mph. Plant population estimates were plants in 40 ft and converted to plants per acre. Seedling height estimates were lengths of the longest extended leaf from the soil surface to the leaf tip (+/- 0.5 cm) for 10 consecutive plants/plot. Root injury was evaluated by digging, pressure washing, and rating (0-3 node injury scale) 5 random plants per plot. Plants were considered root-lodged when stalks at ground level were ≥ 45° from vertical. Performance consistency was the frequency of individual root ratings that were less than the generally accepted economic injury level of 0.25 node lost. Proportion data was transform by ARCSIN function prior to ANOVA and mean separation. Yields were not estimated. Mean separation was by least significant difference (a=0.05) where ANOVA Pr>F was ≤ 0.05.

Notes: This trial was planted late due to weather, and missed a substantial proportion of the hatching CRW eggs. Timely and frequent rain enhanced plant emergence and growth. Severe storms were infrequent. Western corn rootworm hatch commence about 2 June, about 6 days following planting. Anecdotally, the rootworm adult population surrounding the trial site was low to moderate which represented an increase from the previous several years. Relatively cool conditions occurred during pollination.

Results:

The test mean of 27,453 plants per acre was 99 percent of the planter population and indicated that germination/emergence was excellent. No treatment differences (p=0.05) were observed for plants per acre. The range (replicate average) was 26,680 to 27,987 plants (Tables 1,2). There were no treatment differences for seedling height (p=0.05) Tables 3,4). Root injury was below the conventionally accepted injury threshold (0.25 node) for all observations, including the control (Trt 9. DKC61-79 0.250mg). The greatest injury occurred in the three levels of seed treatments including the control. There were no differences among the granular chemical treatments (P=0.05, Tables 5,6). Consistency of performance was confounded with rootworm larval low abundance (all ratings ≤0.25) and no data table is provided. Root lodged plants were not observed when root damage was evaluated.

Table 1. Plants per acre; Rootworm Management Product Efficacy Assay. Throckmorton-Purdue Agricultural Center, Lafayette, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Plants per Acre Mean[3]	SEM
01. Aztec 2.1G	6.7 oz TB	27660.6 a	518.47
02. Aztec 2.1G	6.7 oz IF	27551.7 a	544.50
03. Force 3G	4.0 oz TB	26680.5 a	572.80
04. Force 3G	4.0 oz IF	26789.4 a	628.73
05. Lorsban 15G	8.0 oz TB	27769.5 a	371.96
06. Lorsban 15G	8.0 oz IF	27987.3 a	371.96
07. Counter 20G	6.0 oz IF	26898.3 a	274.06
08. SmartChoice 5G	5.0 oz IF	27333.9 a	208.53
09. DKC61-79 0.250mg/kernel	ST	27769.5 a	482.94
10. DKC61-79 0.500mg/kernel	ST	27769.5 a	449.01
11. DKC61-79 1.250mg/kernel	ST	27769.5 a	741.27

[1]Planted, 5/28/2014; Sampled, 6/17.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=(0.5619).

Table 2. Plants per acre by replicate; Rootworm Management Product Efficacy Assay. Throckmorton-Purdue Agricultural Center, Lafayette, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Plants per Acre R1	R2	R3	R4
01. Aztec 2.1G	6.7 oz TB	28314.0	27007.2	26571.6	28749.6
02. Aztec 2.1G	6.7 oz IF	26136.0	28749.6	27442.8	27878.4
03. Force 3G	4.0 oz TB	25700.4	27878.4	25700.4	27442.8
04. Force 3G	4.0 oz IF	27007.2	28314.0	25264.8	26571.6
05. Lorsban 15G	8.0 oz TB	27442.8	27878.4	28749.6	27007.2
06. Lorsban 15G	8.0 oz IF	27007.2	28749.6	28314.0	27878.4
07. Counter 20G	6.0 oz IF	27442.8	27007.2	26136.0	27007.2
08. SmartChoice 5G	5.0 oz IF	27007.2	27007.2	27442.8	27878.4
09. DKC61-79 0.250mg/kernel	ST	28749.6	27442.8	28314.0	26571.6
10. DKC61-79 0.500mg/kernel	ST	28749.6	27878.4	27878.4	26571.6
11. DKC61-79 1.250mg/kernel	ST	25700.4	29185.2	28314.0	27878.4

[1]Planted, 5/28/2014; Sampled, 6/17.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.

Table 3. Plant Height; Rootworm Management Product Efficacy Assay. Throckmorton-Purdue Agricultural Center, Lafayette, IN.[1]

Treatment	Oz Prod /1000 ft[2]		Extended Leaf Height Mean[3]	SEM
01. Aztec 2.1G	6.7 oz	TB	41.94 a	1.568
02. Aztec 2.1G	6.7 oz	IF	40.94 a	2.143
03. Force 3G	4.0 oz	TB	42.36 a	1.096
04. Force 3G	4.0 oz	IF	40.58 a	1.055
05. Lorsban 15G	8.0 oz	TB	43.18 a	1.259
06. Lorsban 15G	8.0 oz	IF	41.35 a	1.584
07. Counter 20G	6.0 oz	IF	42.89 a	2.042
08. SmartChoice 5G	5.0 oz	IF	40.21 a	2.568
09. DKC61-79 0.250mg/kernel		ST	38.36 a	0.996
10. DKC61-79 0.500mg/kernel		ST	41.18 a	1.323
11. DKC61-79 1.250mg/kernel		ST	38.30 a	1.352

[1]Planted, 5/28/2014; Sampled, 6/17.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=0.0648.

Table 4. Plant Height by replication; Rootworm Management Product Efficacy Assay. Throckmorton-Purdue Agricultural Center, Lafayette, IN.[1]

Treatment	Oz Prod /1000 ft[2]		Extended Leaf Height (cm) R1	R2	R3	R4
01. Aztec 2.1G	6.7 oz	TB	46.55	39.60	40.50	41.10
02. Aztec 2.1G	6.7 oz	IF	42.30	39.85	45.90	35.70
03. Force 3G	4.0 oz	TB	44.40	39.30	42.45	43.30
04. Force 3G	4.0 oz	IF	42.20	39.40	42.50	38.20
05. Lorsban 15G	8.0 oz	TB	44.35	44.55	44.40	39.40
06. Lorsban 15G	8.0 oz	IF	43.80	37.20	43.85	40.55
07. Counter 20G	6.0 oz	IF	46.90	44.80	42.45	37.40
08. SmartChoice 5G	5.0 oz	IF	43.15	41.65	43.45	32.60
09. DKC61-79 0.250mg/kernel		ST	40.40	39.35	37.90	35.80
10. DKC61-79 0.500mg/kernel		ST	44.55	40.80	41.25	38.10
11. DKC61-79 1.250mg/kernel		ST	39.10	40.20	39.60	34.30

[1]Planted, 5/28/2014; Sampled, 6/17.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.

Table 5. Node injury ratings; Rootworm Management Product Efficacy Assay. Throckmorton-Purdue Ag Center, Lafayette, IN.[1]

Treatment	Oz Prod /1000 ft[2]		Node Injury (0-3 Scale) Mean[3]	SEM
11. DKC61-79 1.250mg/kernel		ST	0.065 a	0.0065
09. DKC61-79 0.250mg/kernel		ST	0.052 ab	0.0111
10. DKC61-79 0.500mg/kernel		ST	0.048 abc	0.0149
03. Force 3G	4.0 oz	TB	0.035 bcd	0.0096
01. Aztec 2.1G	6.7 oz	TB	0.028 bcd	0.0118
06. Lorsban 15G	8.0 oz	IF	0.028 bcd	0.0138
07. Counter 20G	6.0 oz	IF	0.022 cd	0.0085
05. Lorsban 15G	8.0 oz	TB	0.022 cd	0.0103
04. Force 3G	4.0 oz	IF	0.012 d	0.0063
08. SmartChoice 5G	5.0 oz	IF	0.012 d	0.0048
02. Aztec 2.1G	6.7 oz	IF	0.012 d	0.0048

[1]Planted, 5/28/2014; Sampled, 7/18.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=0.0049. LSD a=0.05

Table 6. Node injury ratings by replication. Rootworm Management Product Efficacy Assay. Throckmorton-Purdue Ag Center, Lafayette, IN.[1]

Treatment	Oz Prod /1000 ft[2]		Node Injury (0-3 Scale) R1	R2	R3	R4
11. DKC61-79 1.250mg/kernel		ST	0.07	0.06	0.08	0.05
09. DKC61-79 0.250mg/kernel		ST	0.04	0.06	0.08	0.03
10. DKC61-79 0.500mg/kernel		ST	0.04	0.09	0.04	0.02
03. Force 3G	4.0 oz	TB	0.03	0.05	0.01	0.05
01. Aztec 2.1G	6.7 oz	TB	0.01	0.01	0.06	0.03
06. Lorsban 15G	8.0 oz	IF	0.00	0.06	0.01	0.04
07. Counter 20G	6.0 oz	IF	0.00	0.04	0.03	0.02
05. Lorsban 15G	8.0 oz	TB	0.04	0.00	0.04	0.01
04. Force 3G	4.0 oz	IF	0.00	0.01	0.01	0.03
08. SmartChoice 5G	5.0 oz	IF	0.00	0.02	0.02	0.01
02. Aztec 2.1G	6.7 oz	IF	0.02	0.02	0.01	0.00

[1]Planted, 5/28/2014; Sampled, 7/18..
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.

TEST 2 of 2

Corn Rootworm Management Products
Standard Efficacy Trial; Small Plot Assays

Location: Pinney-Purdue Agricultural Center, 11402 South County Line Road, Wanatah, IN 46390

GPS coordinates: 41.447225, -086.941845

Cooperator: Christian Krupke/Larry Bledsoe, Department of Entomology, Purdue University

Planting date: 5/20/2014

Base Hybrid; DKC61-79 RR2 Acceleron 250mg/kernel

Row width: 30"

Planter Population: 32,000 kernels per acre

Soil Type: Sebewa sandy clay loam

Soil Properties:

CEC: 16.6	Mg lbs/ac 1262
Organic matter; 3.9%	Ca Sat'n 66%
pH; 6.7	Mg Sat'n 31%
Lime index 70	K Sat'n 3%
P lbs/ac 46	Base Sat'n 100%
K lbs/ac 344	Ca/Mg 2.1
Ca lbs/ac 4397	Mg/K 12.0

Texture: 49.6% sand, 24.2% silt, 26.0% clay

Tillage: 4/17 disk, 5/29 field cultivator.

Conditions at planting: air temp; 81°F
2" soil temp; 72°F
wind dir and spd; SE 10-15 mph

Previous crop: corn (trap crop)

Previous year insecticide: none

Herbicides:
4/30 2.1 qt/a Bicep II Magnum; 6/3 3.4 oz/a Calisto Extra

Fertilizers:
6/16 150 units of 28% UAN.

Weather data: see Appendix II.

Methods: Randomized complete block design, 4 replicates, single row plots x 100 ft, John Deere® Max-emerge® 7000 planter. Modified Noble® meters were used to apply granular insecticides. All applications were made at 3 mph. Plant population estimates were plants in 40 ft and converted to plants per acre. Seedling height estimates were the lengths of the longest extended leaf from the soil surface to the leaf tip (+/- 0.5 cm) for 10 consecutive plants/plot. Root injury was evaluated by digging, pressure washing, and rating (0-3 node injury scale) 5 plants per plot. Performance consistency was the frequency of individual root ratings that were less than the generally accepted economic injury level of 0.25 node lost. Proportions were normalized using ARCSIN Square Root function. Yields were not estimated. Mean separation was by least significance difference (a=0.05) where ANOVA Pr>F was ≤ 0.05.

Notes:
Planting was late relative to the optimum interval of late April to mid May, however, rootworm hatch appeared to be late at this location. This site received timely rains and excellent growing conditions for most of the season.

Western corn rootworm, *Diabrotica virgifera* was the predominant species at this site and anecdotal observations suggest that adult numbers continue to increase yearly. Root lodging ("goose-neck" stalks) was common in the untreated plants, but not recorded.

Results:

The average of 30,518 plants per acre was approximately 95 percent of the planter population of 32,000. This indicated good germination and emergence conditions.

The greatest average numbers of plants/acre were associated with the control treatment (DKC61-79 0.250mg/kernel) and the high rate seed treatment (DKC61-79 1.250mg/kernel). The granular insecticide treatments, Lorsban 15G 8.0oz-TB, Lorsban 15G 8.0oz-IF, DKC61-79 0.500mg/kernel, and Aztec 2.1G 6.7oz-IF were significantly had significantly fewer plants than the control. (Tables 9,10). Seedling heights for the granular insecticide treatments were greater than the seed treatments, including the control (p=0.05, Tables 11, 12).

Root injury due to rootworm larval feeding in the control was extensive and significantly greater than the granular insecticides and seed treatments (P=0.05). Among the insecticide treatments, the medium and high rate seed treatments were significantly more damaged than the granular insecticides with the exception of Lorsban 15G 8.0oz-TB and Force 3G 4.0oz-IF (Tables 13,14).

Mean separation of both the raw percentages and the transformed data for consistency of products to maintain damage score at or below economic injury was identical. The greatest consistency of performance score (rating ≤ 0.25 node) occurred in the granular insecticides and in the mid and high level seed treatments, and were greater than the control (P=0.05). Consistency of root

protection (injury ≤ 0.25 root node) was lower in the granular insecticides than in the mid and high level seed treatments (P=0.05, Tables 15 to 18).

Table 9. Plants per acre; Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Plants per Acre Mean[3]	SEM
11. DKC61-79 1.250mg/kernel	ST	31907.7 a	650.37
09. DKC61-79 0.250mg/kernel	ST	31689.9 a	674.24
01. Aztec 2.1G	6.7 oz TB	31363.2 ab	562.36
08. SmartChoice 5G	5.0 oz IF	31145.4 ab	217.80
03. Force 3G	4.0 oz TB	30709.8 abc	281.18
04. Force 3G	4.0 oz IF	30492.0 abc	470.50
07. Counter 20G	6.0 oz IF	30492.0 abc	589.81
05. Lorsban 15G	8.0 oz TB	30056.4 bc	308.02
06. Lorsban 15G	8.0 oz IF	29620.8 c	924.047
10. DKC61-79 0.500mg/kernel	ST	29511.9 c	274.06
02. Aztec 2.1G	6.7 oz IF	29403.0 c	377.24

[1]Planted, 5/20/2014; Sampled, 6/23.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=0.0123. LSD a=0.05

Table 10. Plants per acre counts by replicate; Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Plants per Acre R1	R2	R3	R4
11. DKC61-79 1.250mg/kernel	ST	31363.2	32234.4	33541.2	30492.0
09. DKC61-79 0.250mg/kernel	ST	30927.6	31798.8	30492.0	33541.2
01. Aztec 2.1G	6.7 oz TB	30056.4	30927.6	32670.0	31798.8
08. SmartChoice 5G	5.0 oz IF	30927.6	31798.8	30927.6	30927.6
03. Force 3G	4.0 oz TB	31363.2	30492.0	30056.4	30927.6
04. Force 3G	4.0 oz IF	29620.8	31798.8	30492.0	30056.4
07. Counter 20G	6.0 oz IF	30927.6	28749.6	30927.6	31363.2
05. Lorsban 15G	8.0 oz TB	29620.8	29620.8	30056.4	30927.6
06. Lorsban 15G	8.0 oz IF	27442.8	30927.6	28749.6	31363.2
10. DKC61-79 0.500mg/kernel	ST	30056.4	28749.6	29620.8	29620.8
02. Aztec 2.1G	6.7 oz IF	29185.2	28749.6	29185.2	30492.0

[1]Planted, 5/20/2014; Sampled, 6/23.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.

Table 11. Plant Height; Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Extended Leaf Height cm Mean[3]	SEM
03. Force 3G	4.0 oz TB	93.28 a	2.201
02. Aztec 2.1G	6.7 oz IF	93.08 a	1.999
01. Aztec 2.1G	6.7 oz TB	92.61 a	2.398
05. Lorsban 15G	8.0 oz TB	91.76 a	2.356
04. Force 3G	4.0 oz IF	90.79 a	1.688
08. SmartChoice 5G	5.0 oz IF	89.88 ab	2.237
07. Counter 20G	6.0 oz IF	88.90 ab	2.462
06. Lorsban 15G	8.0 oz IF	88.19 ab	1.910
09. DKC61-79 0.250mg/kernel	ST	84.05 bc	1.346
10. DKC61-79 0.500mg/kernel	ST	81.00 c	2.490
11. DKC61-79 1.250mg/kernel	ST	79.39 c	3.407

[1]Planted, 5/20/2014; Sampled, 6/23.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=0.0001. LSD a=0.05.

Table 12. Plant Height by replication. Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Extended Leaf Height R1	R2	R3	R4
03. Force 3G	4.0 oz TB	94.30	95.20	96.75	86.85
02. Aztec 2.1G	6.7 oz IF	94.50	91.20	97.90	88.70
01. Aztec 2.1G	6.7 oz TB	98.75	93.20	91.30	87.20
05. Lorsban 15G	8.0 oz TB	97.45	90.55	92.90	86.15
04. Force 3G	4.0 oz IF	93.90	86.80	93.25	89.20
08. SmartChoice 5G	5.0 oz IF	90.05	94.95	90.45	84.05
07. Counter 20G	6.0 oz IF	81.60	91.65	90.30	92.05
06. Lorsban 15G	8.0 oz IF	92.45	90.30	84.35	85.65
09. DKC61-79 0.250mg/kernel	ST	80.85	84.35	83.60	87.40
10. DKC61-79 0.500mg/kernel	ST	84.70	81.20	84.20	73.90
11. DKC61-79 1.250mg/kernel	ST	80.10	88.75	74.80	73.90

[1]Planted, 5/20/2014; Sampled, 6/23.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.

Table 13. Node injury ratings. Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Node Injury (0-3 Scale) Mean[3]		SEM
09. DKC61-79 0.250mg/kernel	ST	2.438	a	0.2115
11. DKC61-79 1.250mg/kernel	ST	0.542	b	0.2670
10. DKC61-79 0.500mg/kernel	ST	0.525	b	0.1416
05. Lorsban 15G	8.0 oz TB	0.342	bc	0.0541
04. Force 3G	4.0 oz IF	0.220	bc	0.0535
06. Lorsban 15G	8.0 oz IF	0.178	c	0.0461
07. Counter 20G	6.0 oz IF	0.148	c	0.0111
01. Aztec 2.1G	6.7 oz TB	0.130	c	0.0344
08. SmartChoice 5G	5.0 oz IF	0.128	c	0.0281
02. Aztec 2.1G	6.7 oz IF	0.125	c	0.0197
03. Force 3G	4.0 oz TB	0.125	c	0.0425

[1]Planted, 5/20/2014; Sampled, 7/22.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=(0.0001), LSD a=0.05.

Table 14. Node injury ratings by replication. Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Node Injury (0-3 Scale) R1	R2	R3	R4
09. DKC61-79 0.250mg/kernel	ST	2.60	2.00	2.20	2.95
11. DKC61-79 1.250mg/kernel	ST	0.32	0.24	0.29	1.32
10. DKC61-79 0.500mg/kernel	ST	0.70	0.49	0.79	0.12
05. Lorsban 15G	8.0 oz TB	0.19	0.44	0.35	0.39
04. Force 3G	4.0 oz IF	0.36	0.20	0.10	0.22
06. Lorsban 15G	8.0 oz IF	0.08	0.29	0.13	0.21
07. Counter 20G	6.0 oz IF	0.13	0.18	0.14	0.14
01. Aztec 2.1G	6.7 oz TB	0.09	0.08	0.23	0.12
08. SmartChoice 5G	5.0 oz IF	0.14	0.20	0.07	0.10
02. Aztec 2.1G	6.7 oz IF	0.07	0.13	0.14	0.16
03. Force 3G	4.0 oz TB	0.04	0.09	0.24	0.13

[1]Planted, 5/20/2014; Sampled, 7/22.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.

Table 15. Percentage consistency of performance, node injury ratings, transformed BY ARCSIN SQRT. Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	% Consistency (rating ≤ 0.25) Mean Angle[3]	SEM
01. Aztec 2.1G	6.7 oz TB	90.0 a	0.00
02. Aztec 2.1G	6.7 oz IF	90.0 a	0.00
08. SmartChoice 5G	5.0 oz IF	90.0 a	0.00
03. Force 3G	4.0 oz TB	83.4 ab	6.64
07. Counter 20G	6.0 oz IF	83.4 ab	6.64
04. Force 3G	4.0 oz IF	73.6 ab	9.84
06. Lorsban 15G	8.0 oz IF	73.6 ab	9.84
05. Lorsban 15G	8.0 oz TB	60.9 bc	10.90
10. DKC61-79 0.500mg/kernel	ST	48.8 c	14.07
11. DKC61-79 1.250mg/kernel	ST	47.9 c	7.71
09. DKC61-79 0.250mg/kernel	ST	0.0 d	0.00

[1]Planted, 5/20/2014; Sampled, 7/22.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=(0.0001). LSD a=0.05.
ARCSIN SQRT transformed/not back transformed.

Table 16. Percentage consistency of performance, node injury ratings by replication transformed BY ARCSIN SQRT. Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	Percent Consistency(rating ≤ 0.25) Mean Angles R1	R2	R3	R4
01. Aztec 2.1G	6.7 oz TB	90.00	90.00	90.00	90.00
02. Aztec 2.1G	6.7 oz IF	90.00	90.00	90.00	90.00
08. SmartChoice 5G	5.0 oz IF	90.00	90.00	90.00	90.00
03. Force 3G	4.0 oz TB	90.00	90.00	63.44	90.00
07. Counter 20G	6.0 oz IF	90.00	63.44	90.00	90.00
04. Force 3G	4.0 oz IF	50.77	63.44	90.00	90.00
06. Lorsban 15G	8.0 oz IF	90.00	50.77	90.00	63.44
05. Lorsban 15G	8.0 oz TB	90.00	39.23	63.44	50.77
10. DKC61-79 0.500mg/kernel	ST	26.57	39.23	39.23	90.00
11. DKC61-79 1.250mg/kernel	ST	50.77	63.44	50.77	26.57
09. DKC61-79 0.250mg/kernel	ST	0.00	0.00	0.00	0.00

[1]Planted, 5/20/2014; Sampled, 7/22.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
ARCSIN SQRT transformed/not back transformed.

Table 17. Percentage consistency of performance, node injury ratings, non-transformed. Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	% Consistency (rating ≤ 0.25) Mean[3]	SEM
01. Aztec 2.1G	6.7 oz TB	100 a	0.0
02. Aztec 2.1G	6.7 oz IF	100 a	0.0
08. SmartChoice 5G	5.0 oz IF	100 a	0.0
03. Force 3G	4.0 oz TB	95 ab	5.0
07. Counter 20G	6.0 oz IF	95 ab	5.0
04. Force 3G	4.0 oz IF	85 ab	9.6
06. Lorsban 15G	8.0 oz IF	85 ab	9.6
05. Lorsban 15G	8.0 oz TB	70 bc	12.9
11. DKC61-79 1.250mg/kernel	ST	55 c	12.6
10. DKC61-79 0.500mg/kernel	ST	50 c	17.3
09. DKC61-79 0.250mg/kernel	ST	0 d	0.0

[1]Planted, 5/20/2014; Sampled, 7/22.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
[3]ANOVA PR>F=(0.0001). LSD a=0.05.
Raw percentage, non-transformed.

Table 18. Percentage consistency of performance, node injury ratings by replication. Rootworm Management Product Efficacy Assay. Pinney-Purdue Agricultural Center, Wanatah, IN.[1]

Treatment	Oz Prod /1000 ft[2]	% Consistency (rating ≤ 0.25) R1	R2	R3	R4
01. Aztec 2.1G	6.7 oz TB	100	100	100	100
02. Aztec 2.1G	6.7 oz IF	100	100	100	100
08. SmartChoice 5G	5.0 oz IF	100	100	100	100
03. Force 3G	4.0 oz TB	100	100	80	100
07. Counter 20G	6.0 oz IF	100	80	100	100
04. Force 3G	4.0 oz IF	60	80	100	100
06. Lorsban 15G	8.0 oz IF	100	60	100	80
05. Lorsban 15G	8.0 oz TB	100	40	80	60
10. DKC61-79 0.500mg/kernel	ST	20	40	40	100
11. DKC61-79 1.250mg/kernel	ST	60	80	60	20
09. DKC61-79 0.250mg/kernel	ST	0	0	0	0

[1]Planted, 5/20/2014; Sampled, 7/22.
[2]TB=T-band, IF=in-furrow, ST=Clothianidin seed treatment.
Raw percentage, non-transformed.

Appendix I. Weather Observations 2014

Table A1. Throckmorton-Purdue Agricultural Center, Lafayette, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

May 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
05/01	0.00	83	58	66	62
05-01	0.00	58	42	53	54
05-02	T	50	42	48	51
05-03	T	56	45	50	50
05-04	0.00	69	48	56	52
05-05	0.00	65	45	59	54
05-06	0.00	70	47	60	54
05-07	0.00	75	47	63	56
05-08	0.00	86	62	69	60
05-09	0.11	88	64	74	63
05-10	0.82	79	52	m	63
05-11	0.16	74	55	66	63
05-12	1.12	83	62	68	64
05-13	0.02	82	68	70	66
05-14	0.50	75	51	68	66
05-15	0.75	53	44	58	61
05-16	0.34	53	44	m	58
05-17	0.53	51	40	54	56
05-18	0.03	56	40	55	56
05-19	0.00	66	47	59	57
05-20	0.00	71	49	60	58
05-21	0.00	82	62	66	61
05-22	T	85	58	71	65
05-23	0.00	73	50	69	65
05-24	0.00	74	46	70	64
05-25	0.00	77	56	69	64
05-26	0.00	82	60	73	65
05-27	0.00	86	68	75	67
05-28	0.00	86	65	77	68
05-29	T	83	64	74	68
05-30	0.00	83	62	77	69
05-31	0.00	84	64	78	69

T=trace
M=missing

Table A2. Throckmorton-Purdue Agricultural Center, Lafayette, IN.
Precipitation and air temperature observations at 8:00 am.
Soil temperature observations at 11:59 pm.

June 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
06-01	0.00	86	63	78	69
06-02	T	88	70	77	69
06-03	0.57	80	68	74	69
06-04	0.34	85	63	75	70
06-05	0.25	76	54	70	68
06-06	0.00	75	55	70	67
06-07	0.00	81	58	71	67
06-08	0.91	81	59	71	67
06-09	0.00	75	56	71	67
06-10	0.12	78	56	71	67
06-11	0.49	71	63	69	67
06-12	0.00	79	62	70	69
06-13	0.00	81	58	70	69
06-14	0.00	73	52	68	69
06-15	0.00	76	56	66	67
06-16	0.22	84	68	67	67
06-17	0.00	86	71	72	71
06-18	0.00	90	73	74	73
06-19	0.16	89	67	74	74
06-20	0.11	89	69	74	74
06-21	0.00	85	66	75	74
06-22	0.04	85	65	75	74
06-23	0.00	86	69	76	75
06-24	0.26	87	70	75	75
06-25	0.01	76	65	74	74
06-26	0.02	84	63	75	74
06-27	0.00	84	63	75	75
06-28	0.00	87	69	76	75
06-29	0.00	84	72	76	75
06-30	0.00	83	71	76	75

T=trace
M=missing

Table A3. Throckmorton-Purdue Agricultural Center, Lafayette, IN.
Precipitation and air temperature observations at 8:00 am.
Soil temperature observations at 11:59 pm.

July 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
07-01	0.66	85	65	74	74
07-02	0.00	84	65	m	74
07-03	0.01	75	56	74	73
07-04	T	74	50	72	71
07-05	0.00	79	56	71	70
07-06	0.15	78	61	71	70
07-07	0.34	83	67	72	71
07-08	0.51	84	68	74	73
07-09	T	81	60	75	73
07-10	0.00	78	59	74	73
07-11	0.00	77	54	74	72
07-12	0.00	81	57	74	72
07-13	0.46	77	69	73	72
07-14	0.03	83	64	76	74
07-15	0.59	81	53	74	73
07-16	0.00	70	50	70	70
07-17	0.00	72	51	70	69
07-18	0.00	75	54	71	69
07-19	0.00	76	52	m	69
07-20	0.00	76	57	m	69
07-21	0.00	80	59	m	71
07-22	0.00	84	62	m	71
07-23	0.05	85	68	m	73
07-24	0.00	77	55	m	73
07-25	0.00	75	50	m	70
07-26	T	74	57	m	68
07-27	M	M	M	m	70
07-28	M	84	58	m	71
07-29	0.00	70	51	m	70
07-30	0.46	76	53	m	69
07-31	0.00	77	55	m	70

T=trace
M=missing

Table A4. Throckmorton-Purdue Agricultural Center, Lafayette, IN.
Precipitation and air temperature observations at 8:00 am.
Soil temperature observations at 11:59 pm.

August 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
08-01	0.00	80	57	m	71
08-02	0.06	80	58	m	70
08-03	0.00	80	56	m	71
08-04	0.00	84	60	m	71
08-05	0.00	84	62	m	72
08-06	0.00	80	61	m	72
08-07	0.00	79	58	m	71
08-08	0.00	78	60	m	71
08-09	0.00	79	62	m	71
08-10	0.00	79	66	m	71
08-11	0.89	79	66	m	71
08-12	0.02	78	62	m	72
08-13	T	66	55	m	70
08-14	0.00	78	56	m	70
08-15	0.00	77	44	m	71
08-16	0.32	76	46	m	68
08-17	0.29	75	62	71	68
08-18	0.02	77	65	74	70
08-19	0.00	83	64	78	72
08-20	0.41	82	64	77	72
08-21	T	81	64	75	73
08-22	0.35	86	69	77	74
08-23	0.07	83	68	78	76
08-24	0.30	87	68	78	76
08-25	0.00	87	71	79	77
08-26	0.46	89	66	81	79
08-27	0.04	89	65	78	78
08-28	0.00	84	63	78	77
08-29	0.00	81	64	78	77
08-30	0.20	85	68	78	76
08-31	0.98	82	70	76	76

T=trace
M=missing

Table A5. Throckmorton-Purdue Agricultural Center, Lafayette, IN.
Precipitation and air temperature observations at 8:00 am.
Soil temperature observations at 11:59 pm.

September 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
09-01	T	84	71	76	76
09-02	0.34	83	66	75	76
09-03	0.00	79	63	74	74
09-04	0.00	84	64	75	74
09-05	0.00	86	70	76	75
09-06	0.44	91	63	79	76
09-07	0.00	73	50	74	74
09-08	0.00	75	51	70	70
09-09	0.00	79	52	71	70
09-10	0.25	79	59	70	70
09-11	0.73	77	56	71	71
09-12	T	58	50	65	68
09-13	0.08	57	43	62	65
09-14	0.00	63	40	62	64
09-15	0.00	69	45	62	63
09-16	0.46	60	49	60	62
09-17	0.00	66	45	63	63
09-18	0.00	70	46	63	62
09-19	0.00	73	47	64	62
09-20	0.00	74	48	64	62
09-21	0.37	82	59	65	64
09-22	0.00	69	45	66	66
09-23	0.00	66	44	63	63
09-24	0.00	73	44	63	62
09-25	0.00	76	47	63	62
09-26	0.00	81	50	65	63
09-27	0.00	83	50	67	64
09-28	0.00	80	53	68	65
09-29	0.00	83	50	68	65
09-30	0.00	82	50	67	64

T=trace
M=missing

Table A6. Throckmorton-Purdue Agricultural Center, Lafayette, IN.
Precipitation and air temperature observations at 8:00 am.
Soil temperature observations at 11:59 pm.

October 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
10-01	0.00	68	44	67	64
10-02	0.04	78	45	65	63
10-03	2.43	77	62	67	65
10-04	0.41	63	38	64	65
10-05	T	47	38	53	58
10-06	0.05	58	43	52	56
10-07	0.30	66	47	54	56
10-08	0.59	65	43	56	57
10-09	0.04	67	44	56	57
10-10	T	57	45	56	56
10-11	0.00	54	39	55	55
10-12	0.00	59	38	54	54
10-13	0.65	64	40	53	54
10-14	0.56	75	61	60	59
10-15	0.36	66	54	62	61
10-16	0.10	59	53	59	60
10-17	T	60	51	58	59
10-18	0.04	64	43	56	58
10-19	0.05	51	36	54	56
10-20	0.00	57	42	53	54
10-21	T	68	44	54	55
10-22	T	55	34	54	54
10-23	0.00	59	35	52	52
10-24	T	60	37	51	51
10-25	0.00	67	47	54	53
10-26	0.00	74	38	57	56
10-27	0.00	70	42	55	54
10-28	0.23	79	58	57	56
10-29	0.00	61	38	58	57
10-30	0.00	48	32	51	53
10-31	0.01	55	31	50	51

T=trace
M=missing

Table A7. Throckmorton-Purdue Agricultural Center, Lafayette, IN.
Precipitation and air temperature observations at 8:00 am.
Soil temperature observations at 11:59 pm.

November 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
11/01	0.15	46	33	48	49
11/02	0.00	45	27	44	45
11/03	0.00	52	22	43	43
11/04	0.05	66	44	47	46
11/05	0.38	56	41	49	48
11/06	0.11	61	38	48	48
11/07	T	46	38	47	48
11/08	0.00	47	34	45	46
11/09	T	46	36	44	45
11/10	0.00	50	29	42	44
11/11	0.00	63	44	46	46
11/12	0.02	59	33	46	47
11/13	0.00	34	25	40	42
11/14	T	27	22	36	38
11/15	0.00	28	16	34	37
11/16	0.00	36	16	34	35
11/17	0.16	34	28	36	37
11/18	T	29	13	35	37
11/19	T	17	7	34	36
11/20	0.00	36	13	34	35
11/21	0.00	31	17	33	34
11/22	0.04	34	8	33	33
11/23	0.15	55	31	36	34
11/24	1.23	56	47	44	41
11/25	0.00	55	33	44	44
11/26	0.00	33	25	37	38
11/27	0.00	33	24	36	36
11/28	T	29	20	34	35
11/29	0.00	35	17	33	34
11/30	0.00	55	31	37	36

T=trace
M=missing

Appendix II. Weather Observations 2014

Table B1. Pinney-Purdue Agricultural Center, Wanatah, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

May 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
05/01	T	56	42	53	54
05/02	0.13	49	43	48	51
05/03	0.05	52	43	50	50
05/04	0.00	67	45	56	52
05/05	T	54	42	59	54
05/06	0.00	63	39	60	54
05/07	0.00	70	45	63	56
05/08	0.00	84	54	69	60
05/09	0.65	90	63	74	63
05/10	0.16	75	46	m	63
05/11	0.00	73	52	66	63
05/12	0.47	83	59	68	64
05/13	0.60	81	64	70	66
05/14	0.07	73	49	68	66
05/15	0.48	51	42	58	61
05/16	0.04	47	35	m	58
05/17	0.02	44	39	54	56
05/18	T	57	40	55	56
05/19	0.00	65	42	59	57
05/20	0.00	68	50	60	58
05/21	0.29	83	62	66	61
05/22	0.00	82	49	71	65
05/23	0.00	67	45	69	65
05/24	0.00	66	42	70	64
05/25	0.00	75	48	69	64
05/26	0.00	82	58	73	65
05/27	0.76	88	63	75	67
05/28	0.02	83	57	77	68
05/29	0.00	76	54	74	68
05/30	0.00	81	56	77	69
05/31	0.00	83	58	78	69

T=trace
M=missing

Table B2. Pinney-Purdue Agricultural Center, Wanatah, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

June 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
06/01	0.00	86	64	78	69
06/02	0.00	88	67	77	69
06/03	0.10	83	68	74	69
06/04	0.03	80	61	75	70
06/05	0.98	80	49	70	68
06/06	0.00	74	49	70	67
06/07	0.00	80	52	71	67
06/08	0.53	82	56	71	67
06/09	0.00	63	50	71	67
06/10	0.00	79	58	71	67
06/11	0.61	71	63	69	67
06/12	0.04	77	59	70	69
06/13	0.00	80	52	70	69
06/14	0.00	70	47	68	69
06/15	0.00	77	56	66	67
06/16	0.00	83	61	67	67
06/17	0.00	88	71	72	71
06/18	0.00	91	73	74	73
06/19	0.34	86	60	74	74
06/20	1.81	84	65	74	74
06/21	0.01	82	60	75	74
06/22	1.63	78	60	75	74
06/23	0.00	83	65	76	75
06/24	3.31	85	67	75	75
06/25	0.24	81	66	74	74
06/26	0.00	79	59	75	74
06/27	0.00	79	59	75	75
06/28	0.00	86	67	76	75
06/29	0.00	83	70	76	75
06/30	0.12	85	70	76	75

T=trace
M=missing

Table B3. Pinney-Purdue Agricultural Center, Wanatah, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

July 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
07/01	1.23	84	65	74	74
07/02	T	82	63	m	74
07/03	0.21	82	55	74	73
07/04	0.00	71	50	72	71
07/05	0.00	77	51	71	70
07/06	0.00	76	60	71	70
07/07	0.08	83	65	72	71
07/08	0.12	85	70	74	73
07/09	0.09	80	59	75	73
07/10	0.00	76	51	74	73
07/11	0.00	75	50	74	72
07/12	0.00	80	61	74	72
07/13	0.67	77	68	73	72
07/14	0.00	83	61	76	74
07/15	0.02	79	54	74	73
07/16	0.25	69	53	70	70
07/17	0.02	68	47	70	69
07/18	0.00	74	53	71	69
07/19	0.00	77	51	m	69
07/20	0.00	78	55	m	69
07/21	0.00	81	56	m	71
07/22	0.00	83	62	m	71
07/23	0.70	85	62	m	73
07/24	0.00	70	52	m	73
07/25	0.00	73	45	m	70
07/26	0.00	75	45	m	68
07/27	0.00	79	45	m	70
07/28	T	85	59	m	71
07/29	0.00	64	50	m	70
07/30	0.02	76	54	m	69

T=tracem70
M=missing

Table B4. Pinney-Purdue Agricultural Center, Wanatah, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

August 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
08/01	0.00	80	59	m	71
08/02	0.68	80	57	m	70
08/03	0.00	80	52	m	71
08/04	0.10	83	60	m	71
08/05	0.13	83	63	m	72
08/06	0.00	79	57	m	72
08/07	0.00	79	55	m	71
08/08	0.00	79	58	m	71
08/09	0.00	82	62	m	71
08/10	0.00	81	61	m	71
08/11	0.14	84	64	m	71
08/12	0.50	78	64	m	72
08/13	0.39	64	54	m	70
08/14	0.00	78	54	m	70
08/15	0.00	70	42	m	71
08/16	0.00	74	45	m	68
08/17	0.00	77	57	71	68
08/18	0.00	79	64	74	70
08/19	0.00	80	64	78	72
08/20	0.00	82	65	77	72
08/21	0.35	84	62	75	73
08/22	4.12	80	68	77	74
08/23	0.00	85	67	78	76
08/24	1.05	85	66	78	76
08/25	0.00	85	68	79	77
08/26	0.19	88	66	81	79
08/27	2.25	79	64	78	78
08/28	0.00	79	57	78	77
08/29	0.00	80	59	78	77
08/30	0.34	80	67	78	76
08/31	0.18	81	65	76	76

T=trace
M=missing

Table B5. Pinney-Purdue Agricultural Center, Wanatah, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

September 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
09/01	0.00	83	67	76	76
09/02	0.14	82	67	75	76
09/03	0.10	82	60	74	74
09/04	0.00	82	62	75	74
09/05	0.09	83	66	76	75
09/06	0.62	88	62	79	76
09/07	0.00	71	50	74	74
09/08	0.00	76	49	70	70
09/09	0.00	75	57	71	70
09/10	0.57	77	59	70	70
09/11	0.68	76	53	71	71
09/12	0.02	55	50	65	68
09/13	0.09	62	45	62	65
09/14	0.00	60	39	62	64
09/15	T	65	43	62	63
09/16	0.28	58	47	60	62
09/17	0.00	66	39	63	63
09/18	0.00	68	42	63	62
09/19	0.00	72	43	64	62
09/20	0.00	74	49	64	62
09/21	0.71	57	M	65	64
09/22	0.00	M	M	66	66
09/23	0.00	65	M	63	63
09/24	0.00	75	44	63	62
09/25	0.00	76	47	63	62
09/26	0.00	78	48	65	63
09/27	0.00	81	48	67	64
09/28	0.00	80	48	68	65
09/29	0.00	80	45	68	65
09/30	0.00	81	47	67	64

T=trace
M=missing

Table B6. Pinney-Purdue Agricultural Center, Wanatah, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

October 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
10/01	0.00	61	41	67	64
10/02	0.03	68	47	65	63
10/03	1.91	76	60	67	65
10/04	0.29	63	40	64	65
10/05	0.04	63	36	53	58
10/06	0.00	55	40	52	56
10/07	T	63	42	54	56
10/08	0.04	67	42	56	57
10/09	0.00	64	44	56	57
10/10	0.00	60	36	56	56
10/11	0.00	59	33	55	55
10/12	0.00	60	33	54	54
10/13	0.27	63	36	53	54
10/14	0.26	72	58	60	59
10/15	0.48	67	53	62	61
10/16	0.11	58	49	59	60
10/17	0.00	58	47	58	59
10/18	0.02	63	47	56	58
10/19	0.08	49	33	54	56
10/20	0.00	55	31	53	54
10/21	0.01	62	46	54	55
10/22	0.02	54	31	54	54
10/23	0.00	57	28	52	52
10/24	0.00	59	28	51	51
10/25	0.00	67	49	54	53
10/26	0.00	73	42	57	56
10/27	0.00	64	40	55	54
10/28	0.17	76	54	57	56
10/29	0.00	60	39	58	57
10/30	0.00	46	35	51	53
10/31	0.09	52	34	50	51

T=trace
M=missing

Table B7. Pinney-Purdue Agricultural Center, Wanatah, IN. Precipitation and air temperature observations at 8:00 am. Soil temperature observations at 11:59 pm.

November 2014

Date	Precip (inch)	Max Air (°F)	Min Air (°F)	Avg Soil Bare°F	Avg Soil GrassF°
11/01	0.66	41	30	48	49
11/02	0.00	41	22	44	45
11/03	0.00	50	25	43	43
11/04	0.04	63	43	47	46
11/05	0.05	52	34	49	48
11/06	0.05	60	34	48	48
11/07	0.11	46	36	47	48
11/08	T	44	36	45	46
11/09	0.00	45	29	44	45
11/10	0.00	47	31	42	44
11/11	0.00	62	42	46	46
11/12	0.19	58	28	46	47
11/13	0.00	32	23	40	42
11/14	T	30	19	36	38
11/15	0.00	32	16	34	37
11/16	T	30	17	34	35
11/17	0.00	31	14	36	37
11/18	T	24	10	35	37
11/19	T	20	10	34	36
11/20	0.00	35	15	34	35
11/21	0.00	29	9	33	34
11/22	0.10	34	10	33	33
11/23	0.03	50	33	36	34
11/24	M	52	46	44	41
11/25	0.02	49	21	44	44
11/26	0.00	28	21	37	38
11/27	0.11	30	20	36	36
11/28	T	29	19	34	35
11/29	0.00	32	16	33	34
11/30	0.00	52	31	37	36

T=trace
M=missing