

Control of Onion Maggot and Seed Corn Maggot

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Onion Maggot *Delia antiqua*



Seed Corn Maggot *Delia platura*



UC Statewide IPM Project
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- Adult Flies attracted to recently tilled fields.
- Fields that have a lot of organic matter are especially attractive.
- Plantings in early spring more susceptible also.

Chemical Treatments for Onion and Seed Corn Maggots

CHLORPYRIFOS (Lorsban) 4E

Apply as an in-furrow drench in 40 gal/acre. Incorporate into soil 1–2 inches.

Do not make more than 1 application/year.

- **Uses**

- Chlorpyrifos is an organophosphate insecticide, acaricide and miticide used to control foliage and soil-borne insect pests on a variety of food and feed crops.
- **Approximately 10 million pounds are applied annually** in agricultural settings. The largest agricultural market for chlorpyrifos in terms of total pounds ai is **corn (~5.5 million)**.

- **Health Effects**

- Chlorpyrifos can cause cholinesterase inhibition in humans; that is, it can over stimulate the nervous system causing **nausea, dizziness, confusion**, and at very high exposures (e.g., accidents or major spills), **respiratory paralysis and death**.

- **Risks**

- Dietary exposures from eating food crops treated with chlorpyrifos are below the level of concern for the entire U.S. population, including infants and children. Drinking water risk estimates based on screening models and monitoring data from both ground and surface water for acute and chronic exposures are generally not of concern.
- In June, 2000, the Agency entered into an agreement with the technical registrants to eliminate virtually all homeowner uses, except ant and roach baits in child resistant packaging.
- Residential postapplication exposures may occur after termiticide use in residential structures. To mitigate risks from this use, the technical registrants agreed in June 2000 to limit termiticide treatments to 0.5% solution, and cancel all postconstruction uses. Pre-construction use will remain until 2005, unless acceptable exposure data are submitted that show that residential postapplication risks from this use are not a concern.
- Risk quotients indicate that a single application of chlorpyrifos poses **risks to small mammals, birds, fish and aquatic invertebrate species** for nearly all registered outdoor uses. Multiple applications increase the risks to wildlife and prolong exposures to toxic concentrations. To address these risks, a number of measures including reduced application rates, increased re-treatment intervals, reduced seasonal maximum amounts applied per acre, and no-spray setback zones around water bodies will be needed

Chemical Treatments for Onion and Seed Corn Maggots

DIAZINON* 14G

Broadcast and incorporate into soil 3–4 weeks before planting

DIAZINON* AG500

Apply in sufficient water to drench seed furrow at planting.

Use Profile

Diazinon is registered to control foliage and soil insects and pests of many fruit, nut, vegetable, and ornamental crops. Diazinon also is used in cattle ear tags. All residential uses have been cancelled. **Approximately 4 million pounds** of the active ingredient diazinon are **used annually** on agricultural sites. Use is highest on **almonds and stone fruits**.

Health Effects

Diazinon can cause cholinesterase inhibition in humans; that is, it can over stimulate the nervous system causing **nausea, dizziness, confusion**, and at very high exposures (e.g. accidents or major spills) **respiratory paralysis and death**.

Risks

Dietary risks from exposure to diazinon residues in food and drinking water do not exceed the Agency's level of concern. ! Occupational exposure to diazinon is of **concern to EPA for handlers and applicators** of diazinon as well as to workers entering fields after applications.

! EPA has identified ecological risks of concern from diazinon use, particularly to birds, mammals, bees, fish, and aquatic invertebrates.

Advantages of Seed Treatments

- Apply only a small amount of a pesticide.
- Material is located where it is needed most.
- Environmentally safer.
- Looked upon more favorably by regulators and environmental groups as opposed to broadcast applications.

Test Materials

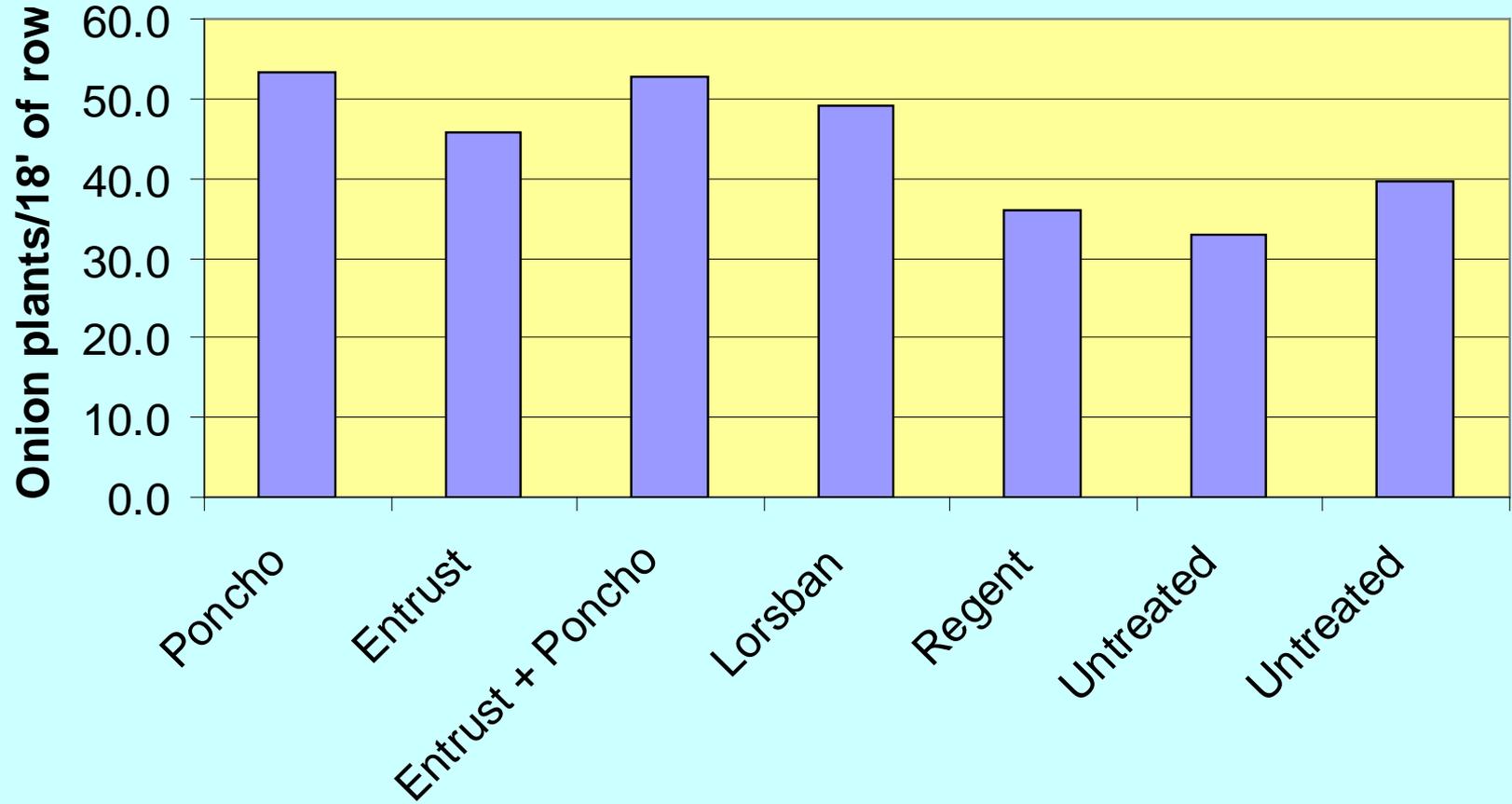
- Poncho- *Chlothianidin* Bayer Crop Science
- Cruise- *Thiomrthoxam* Syngenta Crop Protection
- Regent- *Fipronil* BASF
- Entrust- *Spinosad* Dow AgriSciences
- Trigard- *Cryomazine* Syngenta Crop Protection

2005 Onion Maggot Control Trial at Tulelake

No.	Trade Name	Application Method	Rate	# of Onions/18' of Seed Row
1	Poncho	Seed Treatment	10.5 fl oz/100 lb	53.3
2	Entrust	Seed Treatment	5 lb/100 lb seed	45.9
3	Entrust + Poncho	Seed Treatment	5 lb + 10.5 oz/100 lb seed	52.8
6	Lorsban	In Furrow	6.7 lb/acre	49.0
8	Regent	In Furrow	4.2 oz/acre	36.0
9	Untreated			32.9
10	Untreated			39.5

2005 Onion Maggot Control Trial

Plant Stand

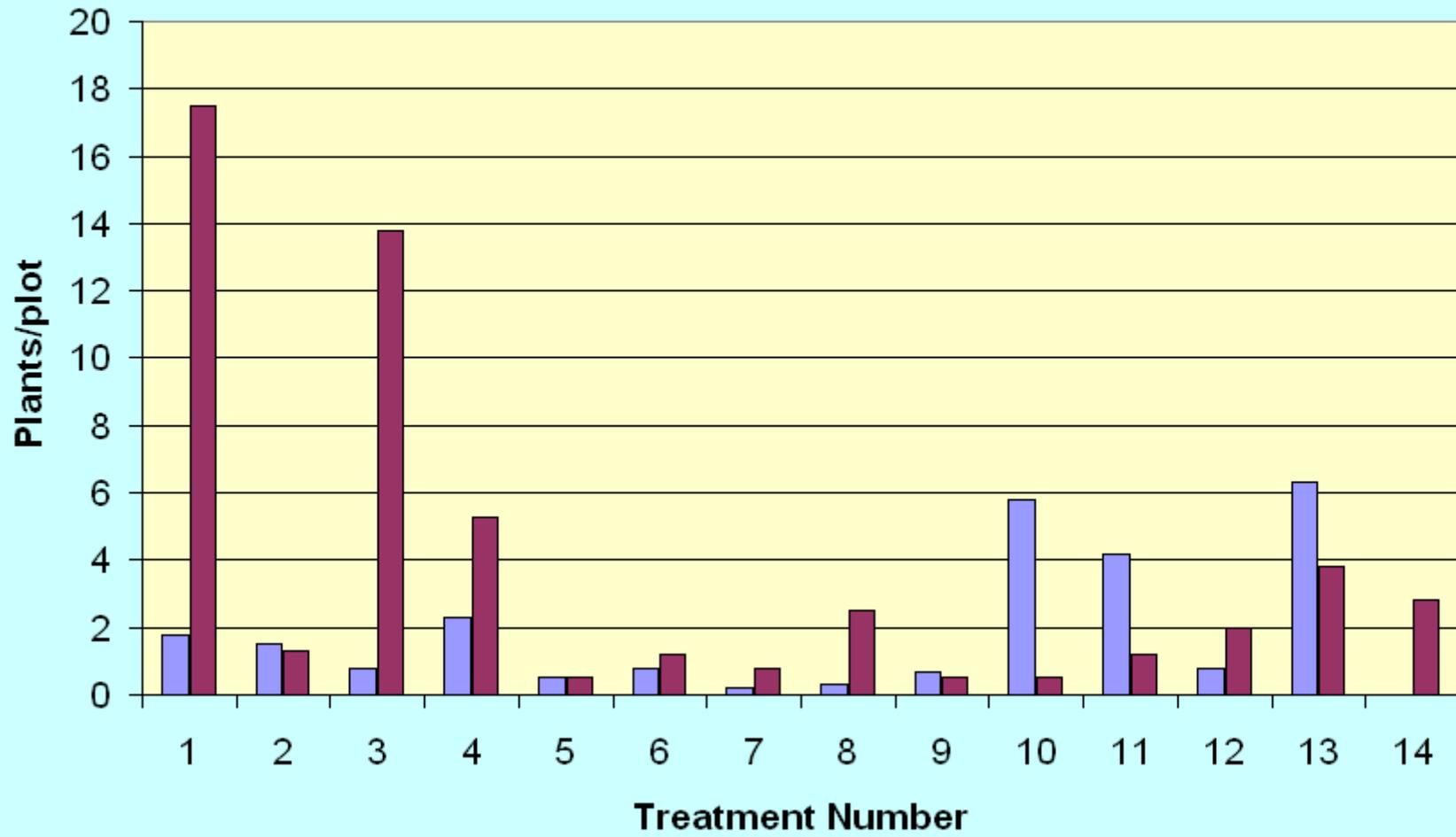


2006 Maggot Control Trial – Treatment List

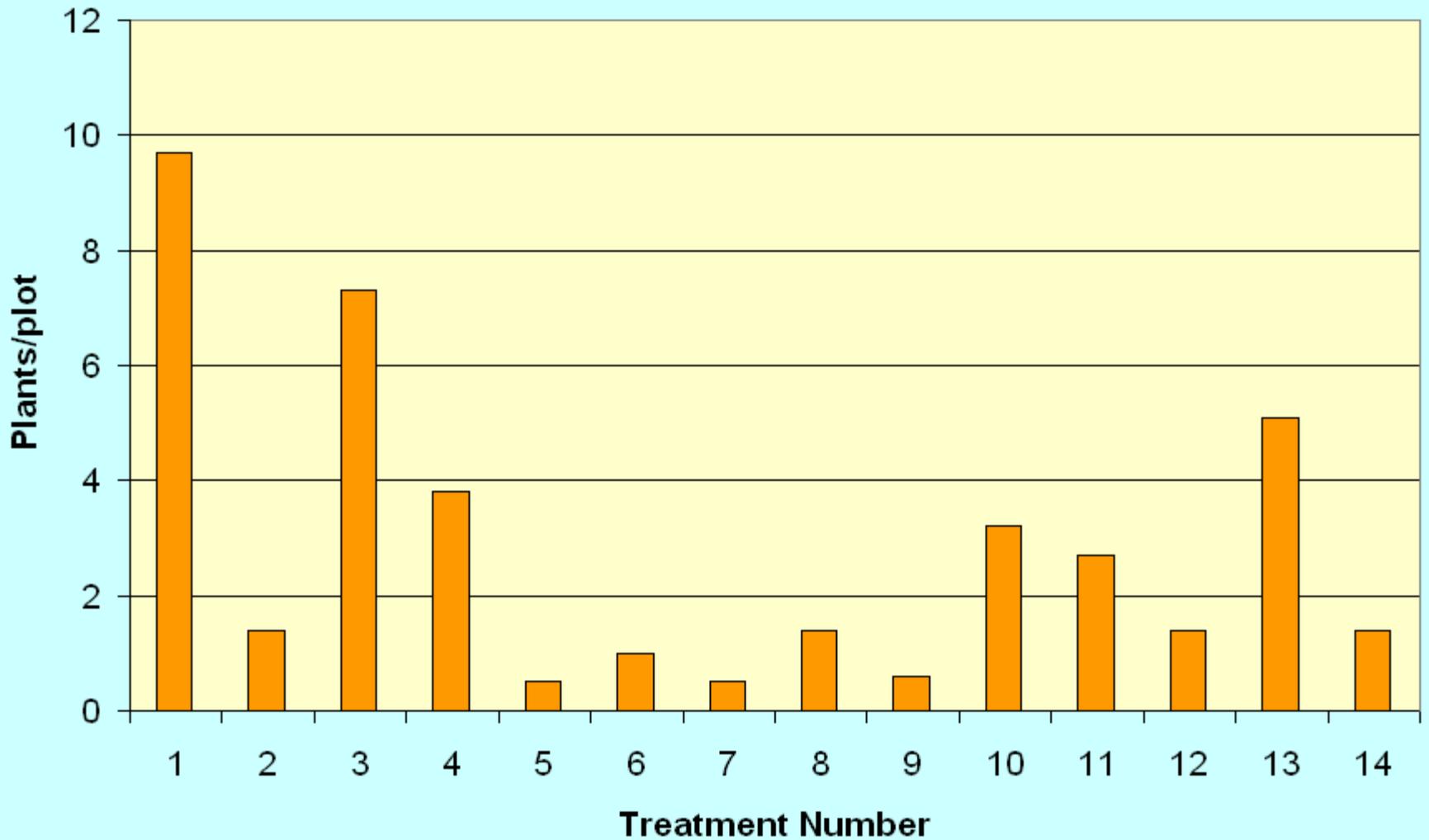
Treatment #	Chemical	Rate
1	Untreated	
2	Lorsban 4E as a drench in furrow	38.3 fl oz/A
3	Trigard 75WP	5.0 g a.i./100 g of seed
4	Lorsban 4E + Trigard 75WP	38.3 fl oz/A + 5.0 g a.i./100 g of seed
5	Regent 500	2.5 g a.i./100 g of seed
6	Entrust	5.0 g a.i./100 g of seed
7	Entrust	7.5 g a.i./100 g of seed
8	Poncho 600	50 g a.i./kg of seed
9	Poncho 600	34 g a.i./kg of seed
10	Poncho Delta	26 g a.i./kg of seed
11	Poncho Delta	39 g a.i./kg of seed
12	Poncho Delta	44 g a.i./kg of seed
13	Poncho Delta	52 g a.i./kg of seed
14	Lorsban 15G dibbled over the seed row	38.3 fl oz/A

Average Number of Damaged Plants Per Plot

Lyman Seus

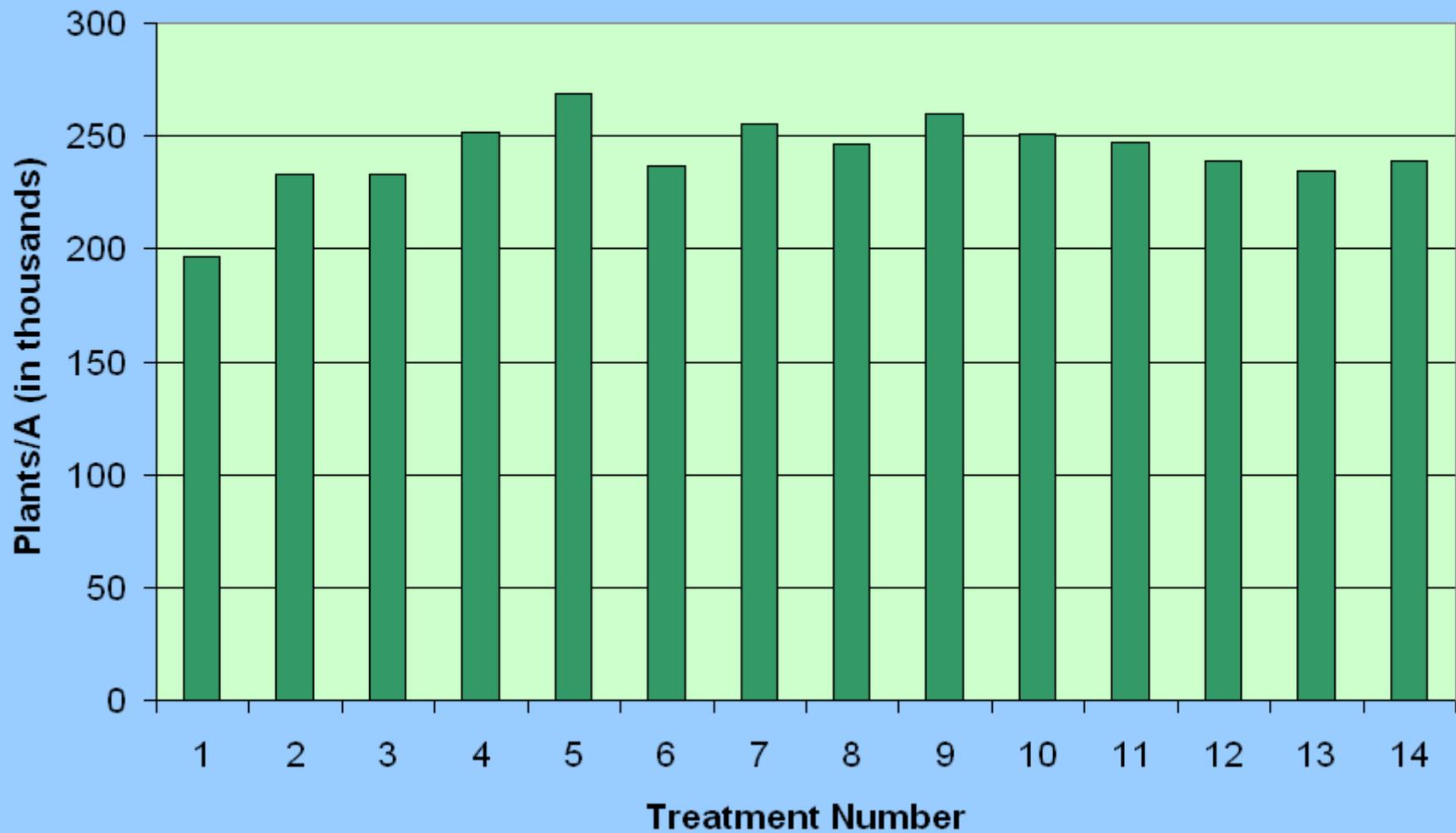


Over Location Average Number of Damaged Plants Per Plot

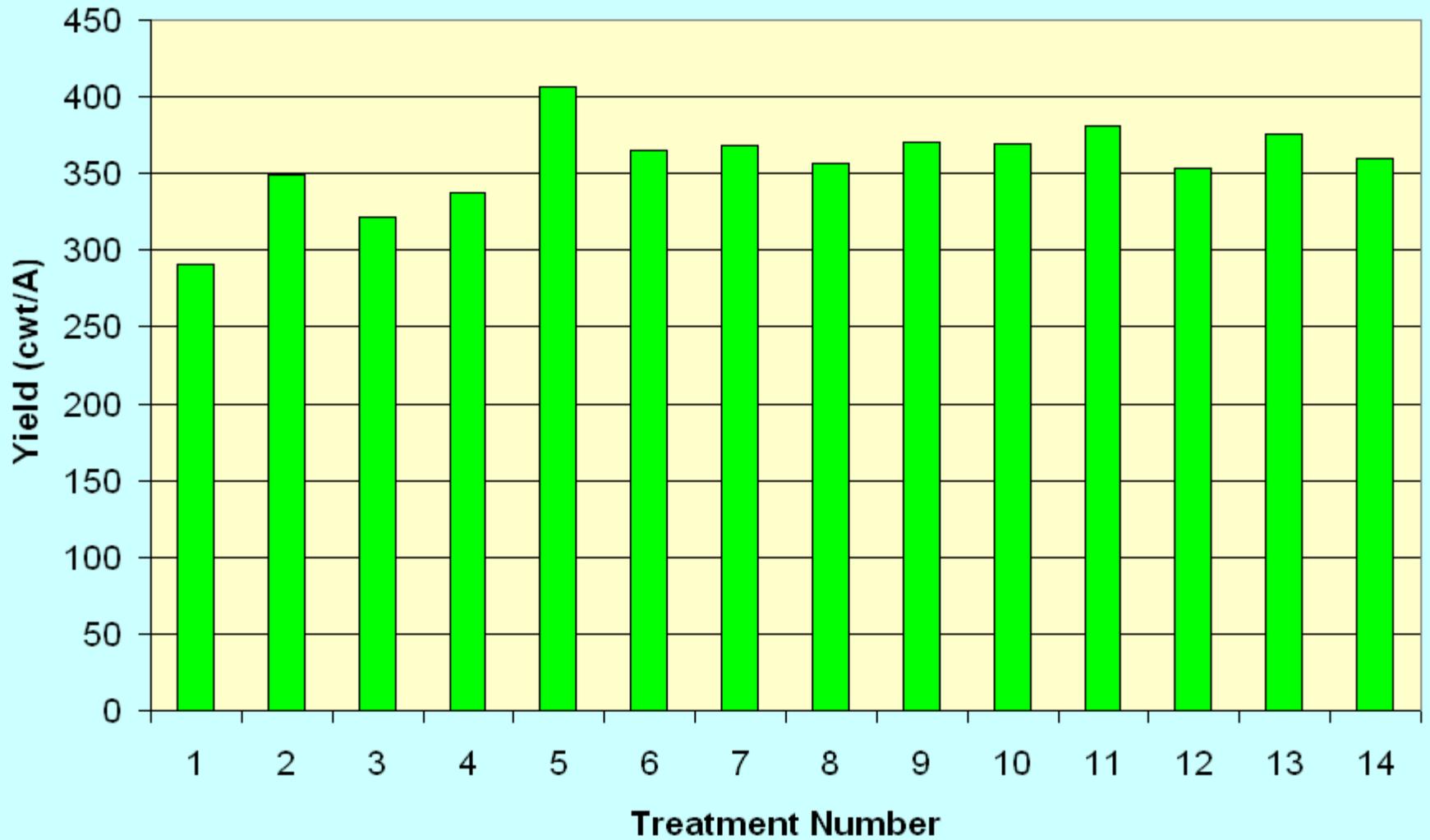


Over Location Onion Stand

Plants/A (in thousands)

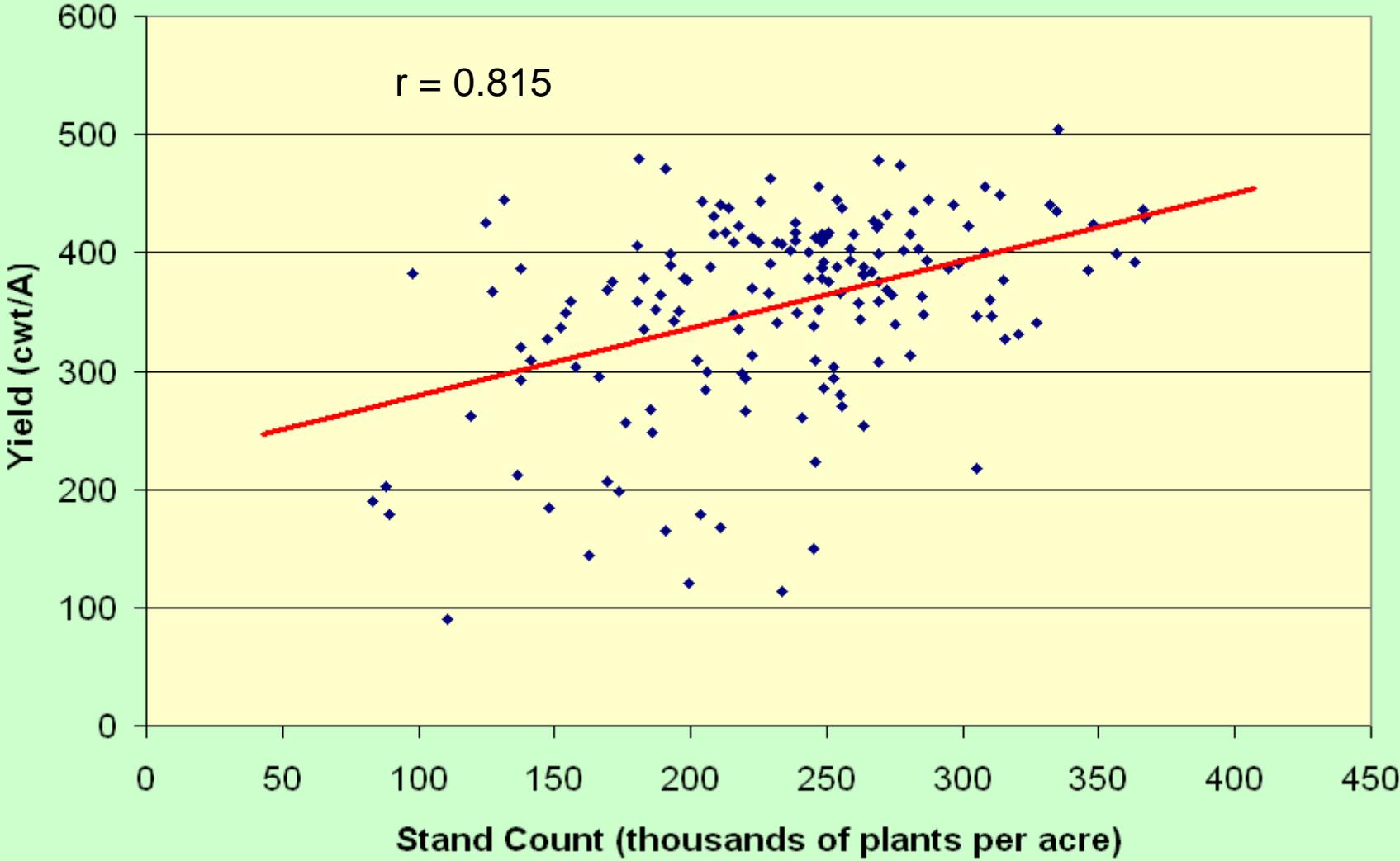


Over Location Onion Yield



Onion Stand vs. Yield

(2006 maggot trial)



2006 Antelope Valley Seed Corn Maggot Trial

- Control
- Poncho *Bayer Crop Science* 0.5 ml/1000 seed
- Cruiser *Syngenta* 1.28 fl oz/cwt seed
- Regent *BASF* 2.0 fl oz/cwt seed
- Entrust *Dow* 5 gram a.i./100 gram seed

2006 Antelope Valley Seed Corn Maggot Trial

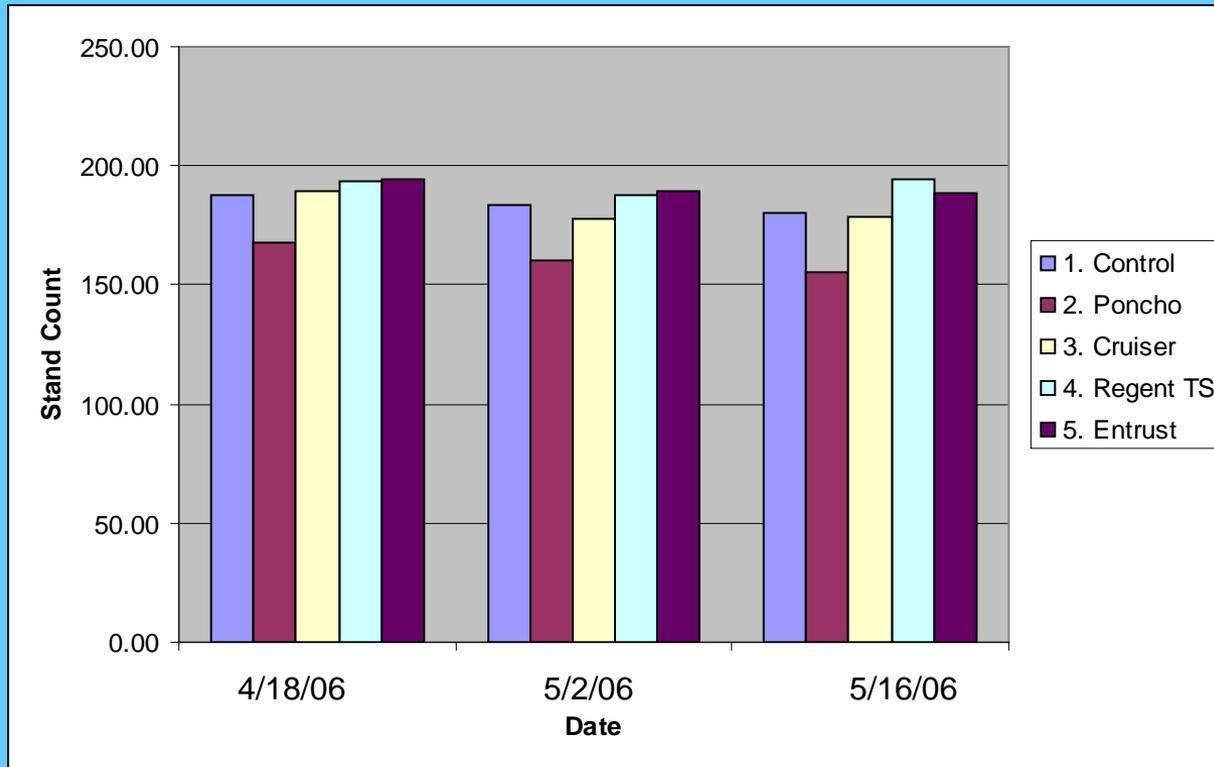
Grower: John Calandri
 Application Date: April 2, 2006

Plot size: 36" bed x 25 ft
 Soil type Sandy Loam

Average Stand Count

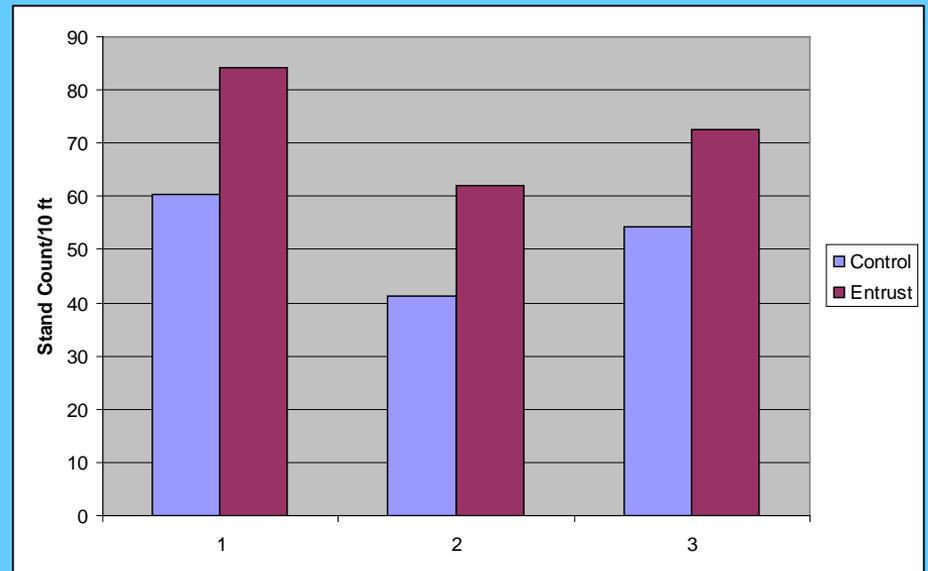
	<u>4/18/2006</u>	<u>5/2/2006</u>	<u>5/16/2006</u>
1. Control	187.50	183.75	180.00 A
2. Poncho	167.50	160.25	155.25 B
3. Cruiser	189.75	177.75	178.25 A
4. Regent TS	193.25	188.00	194.25 A
5. Entrust	194.75	189.00	188.25 A
LSD=	NS	NS	22.48
%CV=	7.68	8.12	8.14
P=	0.11	0.0894	0.02

Average Stand Count



Cuyama Entrust Demonstration Trial

<u>Date</u>	<u>Control</u>	<u>Entrust</u>
5/5/06	60.25	84.25
5/19/06	41.25	62.0
6/2/06	54.25	72.5



Evaluation of Entrust in coated seed treatments near Tehachapi, CA

Grower: Grimmway Farms (Cal Organic)

Locations: Highline road and Cummins Valley

Planting Date: April 20,2006

Plot size: 40" bed x 15 ft length

Seed Treatment within seed coating.

Soil Type: loam

Treatment	Location	T-Test p-value	Stand Counts 5/4 per 15 ft	Stand Counts 5/22 per 15 ft
1. Entrust	Highline		71	77
2. Untreated	Highline	0.03	49	50
3. Entrust	Cummins Valley		115	118
4. Untreated	Cummins Valley	0.02	90	95

TABLE 3. Evaluation of several granular and broadcast treatments for control of seed corn and onion maggot in onions.

Grower: Son Rise Farms (John Calandri)	Plot Size: 36" bed x 30' long (4 replications)
Location: 80th Street East and Avenue K (Kotchian Ranch)	Nozzle: 8004 EVS @ 25 psi
Treatment Dates: Granular on 3/31/06 and Drench on 4/11/06	GPA: 52.4
Soil Type: Sand with loam	

Treatment	Rate/Acre	Application ¹	lbs. a.i. per acre	% Stand Loss 5/19/06
1. Diazinon 14G	20 lbs	granular mulch	2.9	1.3%
2. Lorsban 15G	3.4 lbs	granular mulch	0.5	2.8%
3. Diazinon 14G	6 lbs	granular mulch	0.9	1.8%
4. Regent 4 SC	3.47 oz	drench @ stinger	0.1	3.7%
5. Diazinon AG500	2 qts	drench @ stinger	2.0	2.6%
6. Lorsban 4E	1 qt	drench @ stinger	1.0	5.7%
7. Success	10 oz	drench @ stinger	0.15	4.1%
8. Untreated Check	----	----	----	5.3%
LSD (p = 0.05)				3.3%

<u>Rating:</u>	<u>Description:</u>
1. Application type	The application type was in two forms; a. Granular mulch applied at planting; and b. A drench applied to the surface of the soil and watered in at the onion stinger germination stage.
2. % Stand Loss	The percent stand loss was evaluated over 4 weeks during the germination period. Samples with maggot strikes were counted and recorded. The final percent stand loss represents the portion of the stand that was lost to maggot strikes.

