

Sunflower Treated with Avipel (Anthraquinone) Bird Repellent

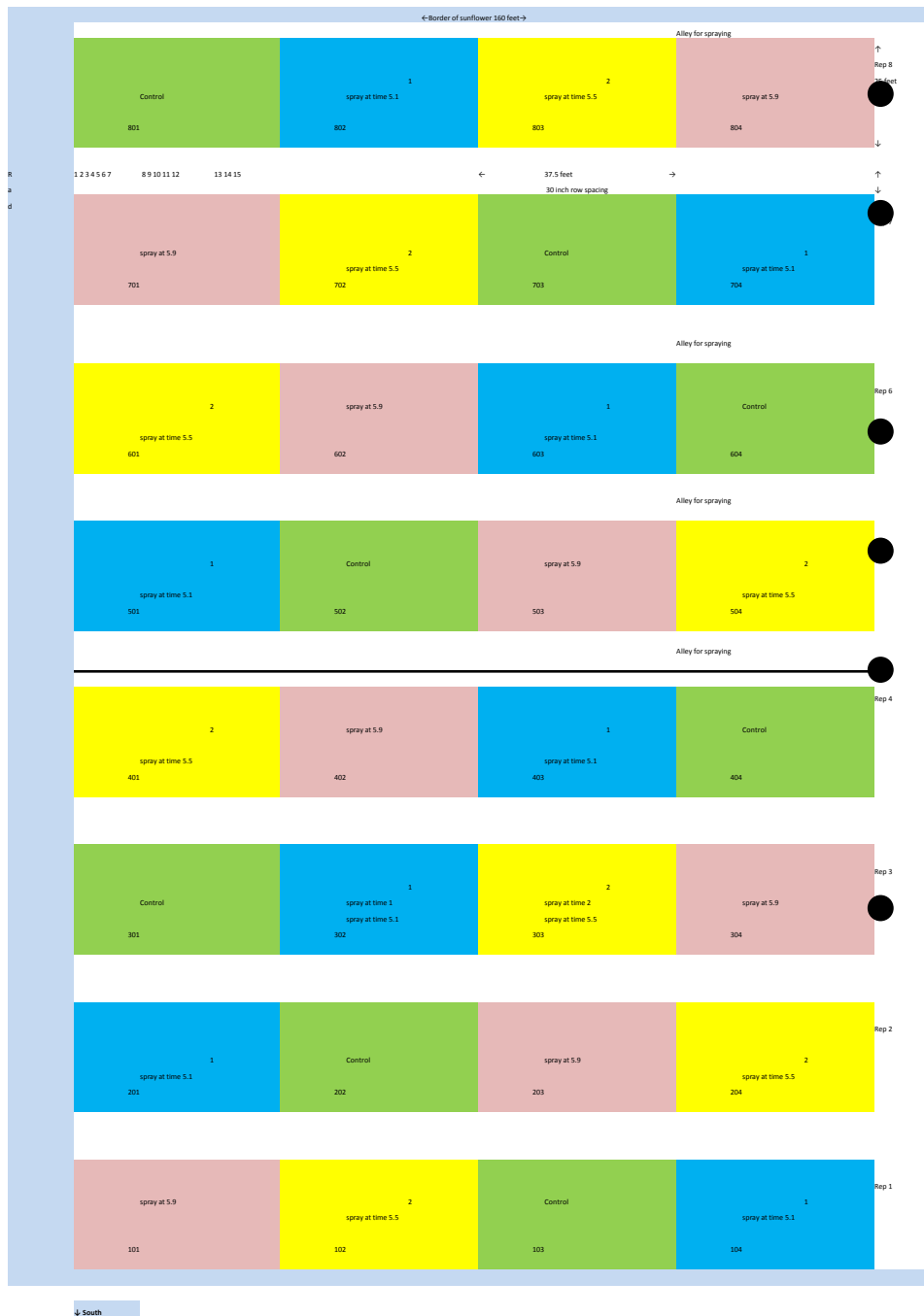
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Bird damage production issue

- Maturing sunflower is susceptible to damage by birds especially blackbirds (*Agelaius phoeniceus* and *Quiscalus quiscula*).
- The National Sunflower Association (NSA) identified Blackbird damage to sunflower as a major issue in the production of sunflower throughout the US.

Objective

- Establish the amount of residue on the sunflower head after application of Anthraquinone
- Observe the plots for bird activity
- Establish the residue levels on the seed
- Observe actual bird damage at harvest
- Measure yield
- Observe plant growth to make sure there is no negative effect of the Anthraquinone



- 8 replicates
- Control (no treatment)
- Application at R5.1
- Application at R5.5
- Application at R5.9
- Hybrid used Croplan 564CL,NS (Clearfield)

Management Dates 2008

- Planting date May 29
- Beyond Herbicide application July 1
- Application of Anthraquinone August 13 (R5.1 and R5.5)
- Application of Anthraquinone August 19 (R5.9)
- Harvest October 9-10



August 8th 2008 not
all sunflower in bloom



August 8th in field
variability



Heads at bloom 5.1 at application of bird repellent (August 13 2008)



Heads at bloom 5.5 at application of bird repellent



August 13th
Application



Application

- Rate 1 gallon of 'Avipel' liquid per acre
- Active ingredient 9,10-Anthraquinone 50% and other ingredients 50%
- One gallon 'Avipel' in 10 gallons of water
- Spray direction facing the sunflower head
- Spray pressure 35 Psi



Filter paper top at
R 5.1

Filter paper right at
R5.9



Filter paper interception



Gallon
'Avipel'
(acre)

Control 0.008b

Bloom 5.1 0.089b

Bloom 5.5 0.593a

Bloom 5.9 0.002b

Mean 0.17

CV % 250

$P < 0.10$



Head samples day after
application
Top R5.1-5.2
Bottom R5.5



Before spraying sunflower heads were marked with a ribbon and at harvest heads were bagged and shipped to the Lab.



Residue on sunflower seed ppm

	Anthraquinone (ppm)
Control	0b
Bloom 5.1	15.7a
Bloom 5.5	6.6ab
Bloom 5.9	1.4b
Mean	5.9
CV %	175
P < 0.05	

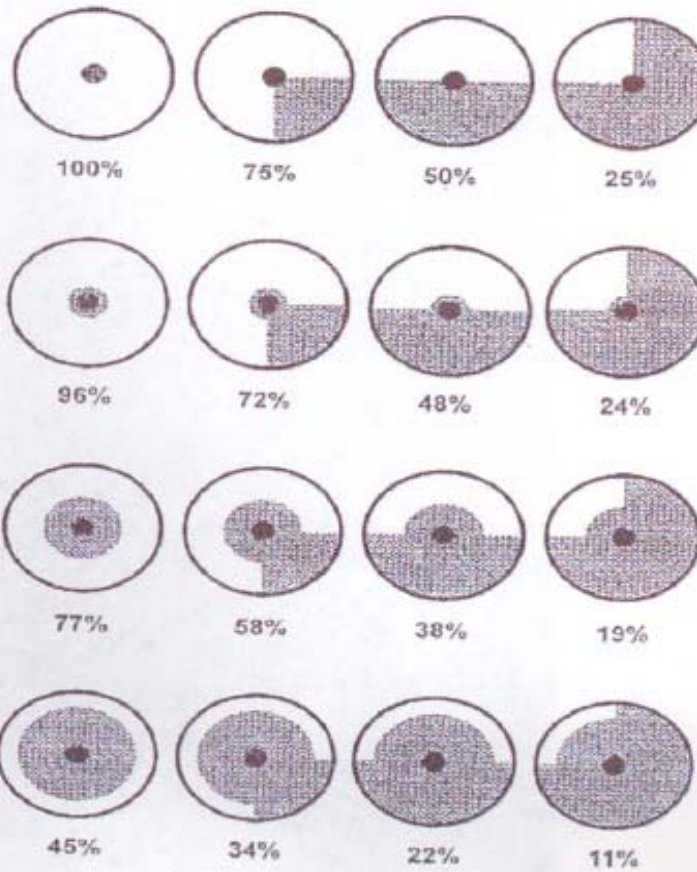
Birds in nearby field



Table 1. Example of observations recorded on bird feeding activity in 2008.

Observer: LM	Date	Species	Total #	Behavioral Observations
Observer SG	Sunny mid 40's East breeze 5 mph			
6		AmGo	1	Perching on head, not eating
4			0	There are no birds
11			0	~25 AmGo flew over, none in plot
5		RoDo	1	on ground
16		AmGo	6	Perching on head, not eating
18		AmGo	2	Not on heads, not eating
12		AmGo	3	Not eating
9		RoDo	2	flushed from ground when I approached
1		AmGo	1	Perching on head, not eating
13		RoDo	1	flushed from ground when I approached
3			0	There are no birds
17		AmGo	1	flushed when I approached

Bird Damage % Seed Loss







Yield, Head Damage and Adjusted Yield

	Seed Yield	head damage	Adjusted yield
	(lb/a)	(%)	(lb/a)
Control	1866	18.1	2291
Bloom 5.1	1979	14.2	2295
Bloom 5.5	1875	17.3	2250
Bloom 5.9	1926	16.1	2297
Mean	1911	16.4	2283
	NS	NS	NS
CV %	10.4	29.3	9.3

Height, Harvested Heads, Seed Weight per Head

	height	20 ft x 2rows harvested	Seed/ Head
	(inch)	(heads)	(gram)
Control	65.9	49.0	44.1
Bloom 5.1	64.6	46.5	49.8
Bloom 5.5	64.5	48.6	45.2
Bloom 5.9	64.9	48.1	46.4
Mean	65.0	48.1	46.4
	NS	NS	NS
CV %	4.3	11.5	17.0

Lessons learned

- Sunflower plant growth does not appear to be negatively influenced by the application of Anthraquinone.
- It was difficult to get the timing of the application right as the individual sunflower plants were at different growth stages at any given time.
- As the heads start to bend over it will be more challenging to apply the repellent to the front of the head.

Lessons Learned

- In the beginning of head fill there were no differences in bird damage visible.
- Birds were observed in a nearby field and only a few in the experimental area.
- No significant differences in amount of bird damage.

Lessons Learned

- Relative low amounts of product were found on the filter paper.
- No significant differences in yield were observed.
- Earlier application had more residue on the seed than later application.