

**Field Trials in Commercial
Pecan Orchards in Georgia
with California Prionus
Pheromone as an
Attractant for Tilehorned
Prionus and Broadnecked
Root Borer**

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Objectives

1. What is the emergence pattern in pecan orchards?
2. How long are the pheromone lures effective in the pecan orchard?
3. How effective is soil application of chlorpyrifos on the adult male beetles?
4. Can the beetles be trapped out with the pheromone traps?

Prionus laticollis oviposition



Normal Pecan Orchard - July



Are the trees infested?

Look for symptoms and signs of an infestation



Crown gall and root borer infestations



Fitzgerald Monitoring Site



Pheromone traps and root sampling can be used to find the relative abundance



Trees topple in high winds



Clearing trees for a new orchard



Larvae chew through the irrigation



Prionus infestation near Fitzgerald



Source of map: Google Earth 2013 Digital Globe

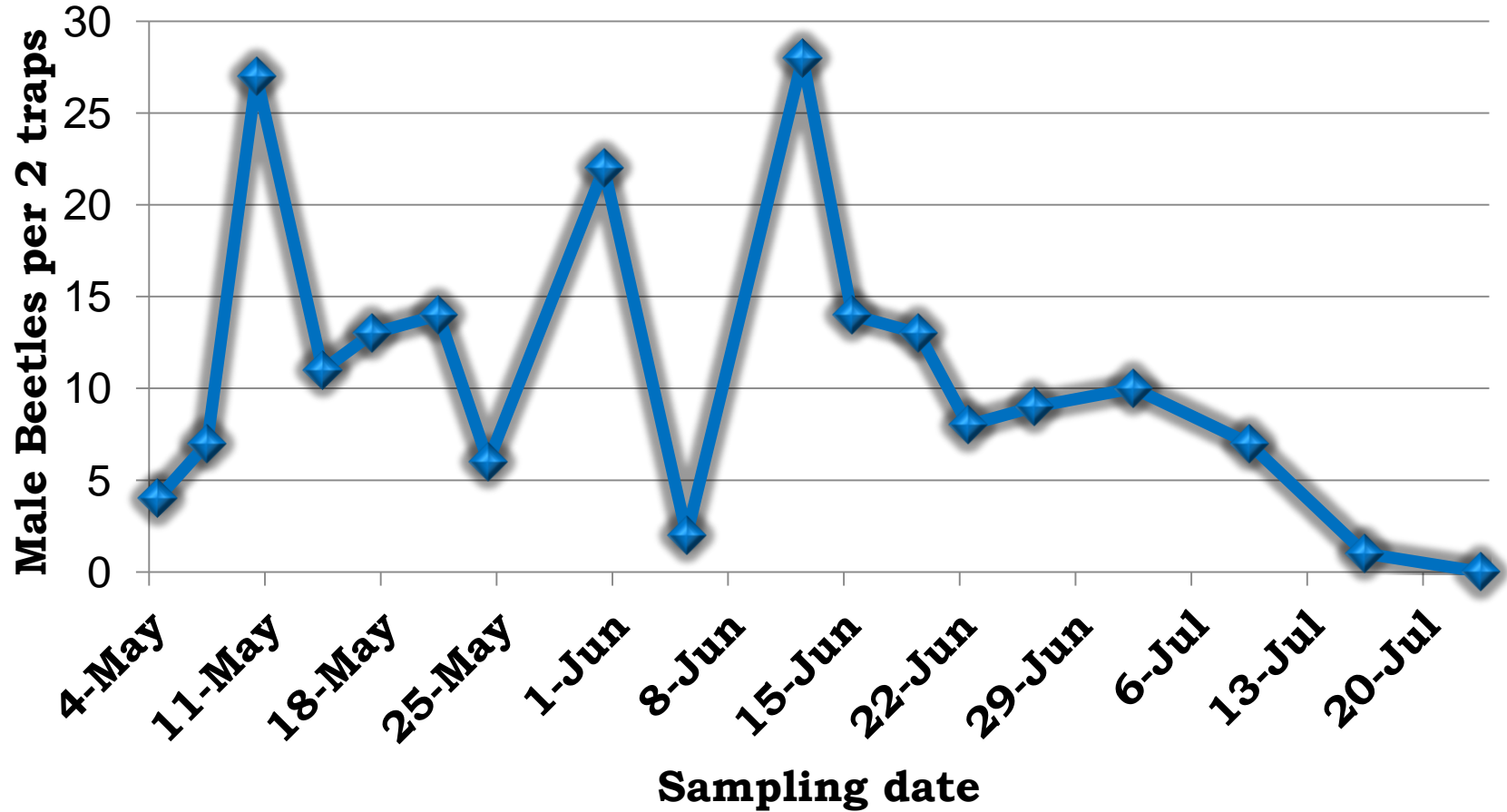
Prionus infestations in Mendes, GA



Source of map: Google Earth 2013 Digital Globe

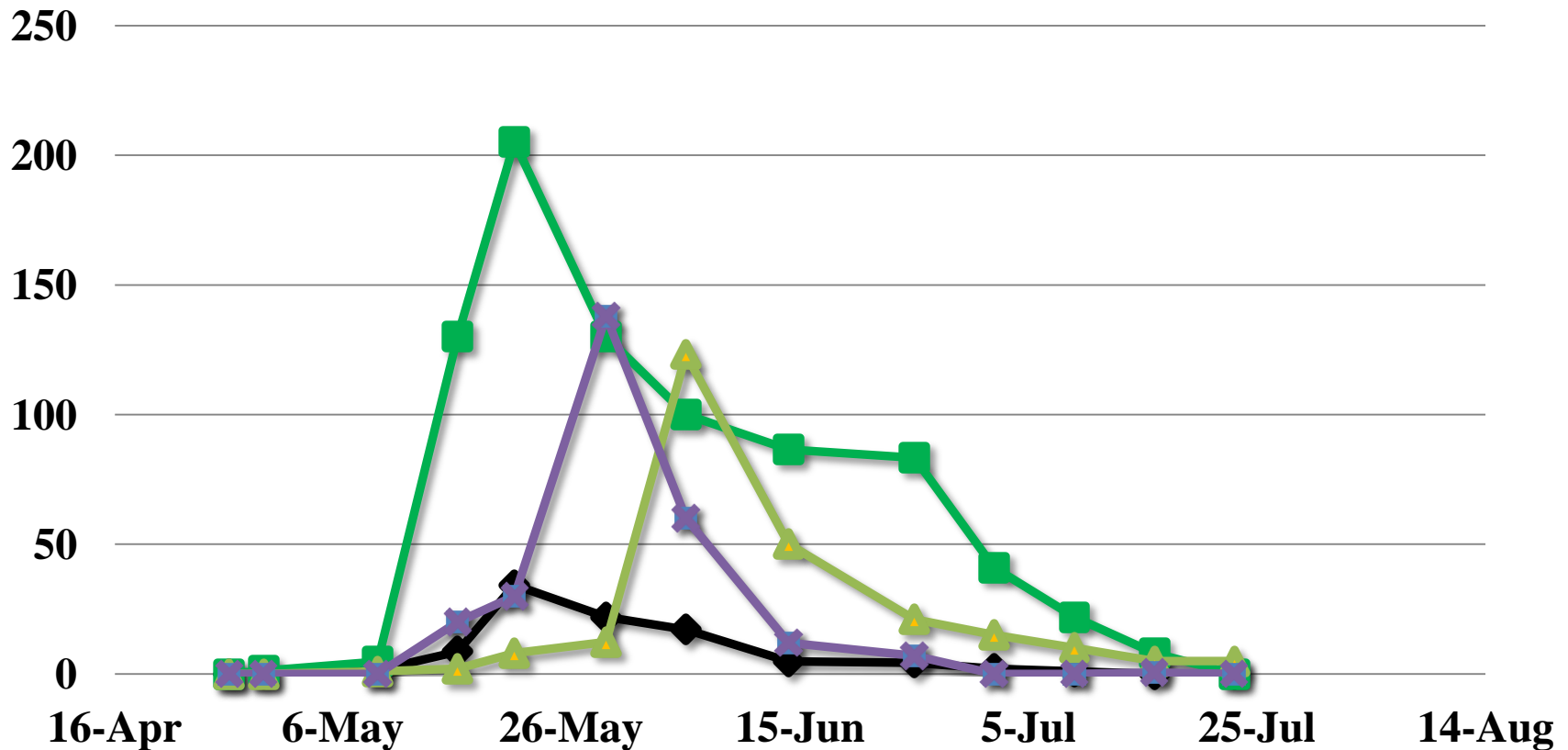
Fitzgerald, GA *Prionus* Trap Catch 2012

Trap Catch (2 traps)



Prionus Trap Catch 2013

Number *P. imbricornis* males/trap



◆ Cordele ■ Albany ▲ Perry ★ Leesburg

of traps:

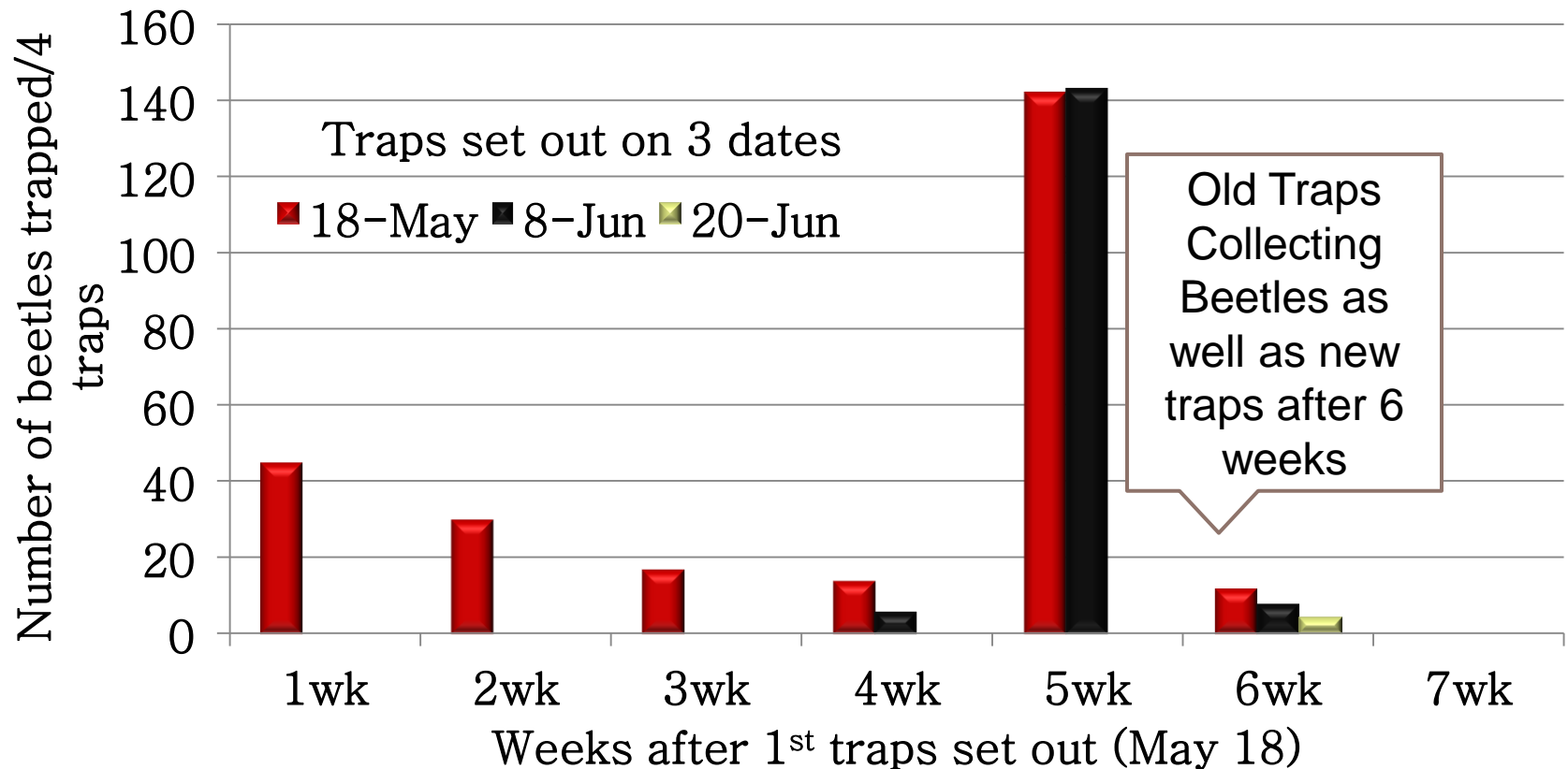
43

12

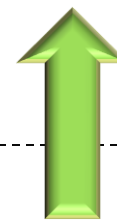
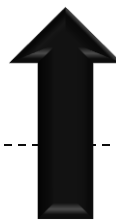
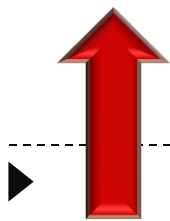
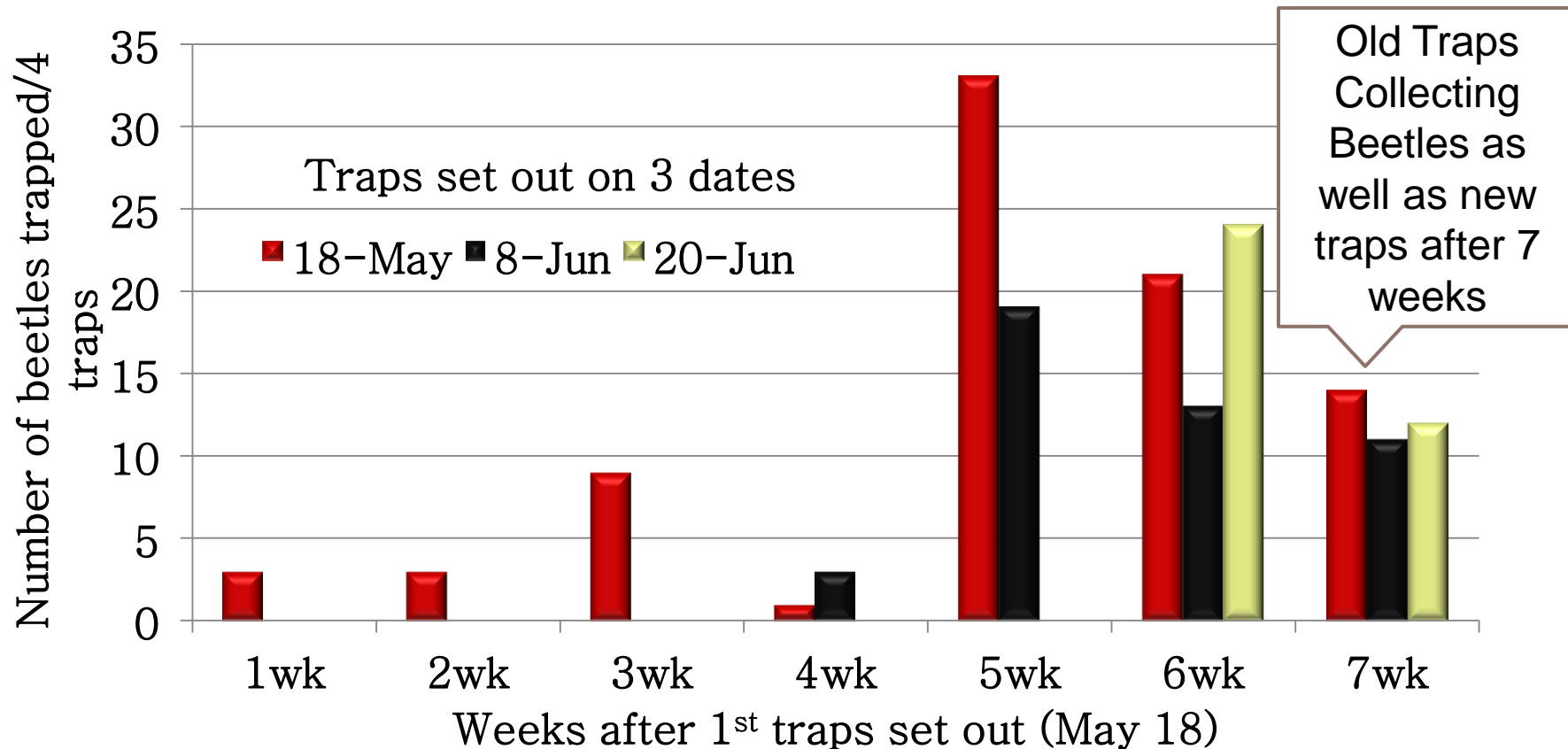
12

3

How long do the pheromone lures last for *P. imbricornis*?



How long do the pheromone lures last for *P. laticollis*?

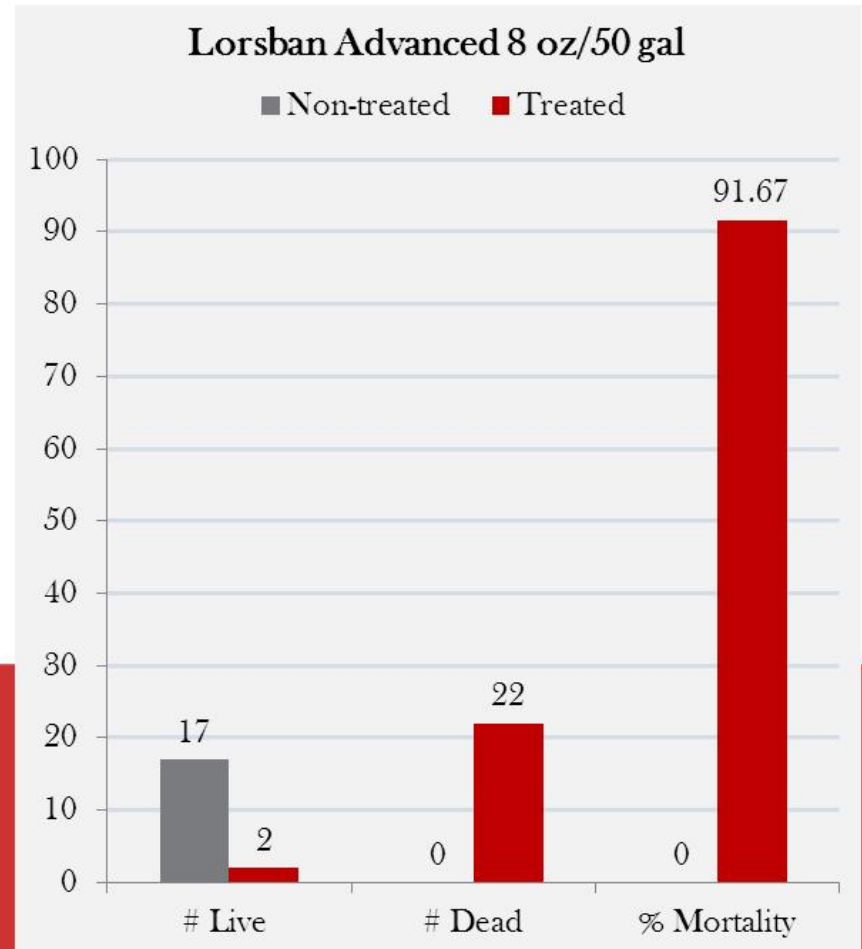
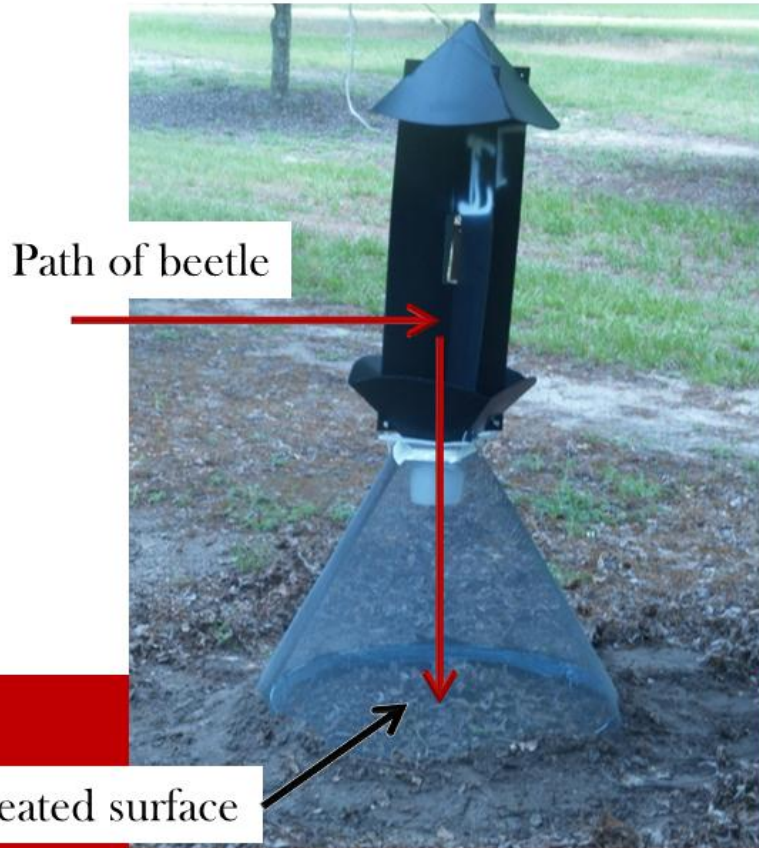


Lorsban Efficacy Trial



CHEMICAL CONTROL BIOASSAY

Since the adult beetles spend a long period digging through the soil chemical control may be possible to treat the soil with a long residual contact poison during adult emergence. Lorsban Advance (Dow) proved to be an effective control (92% mortality) in the field bioassays.



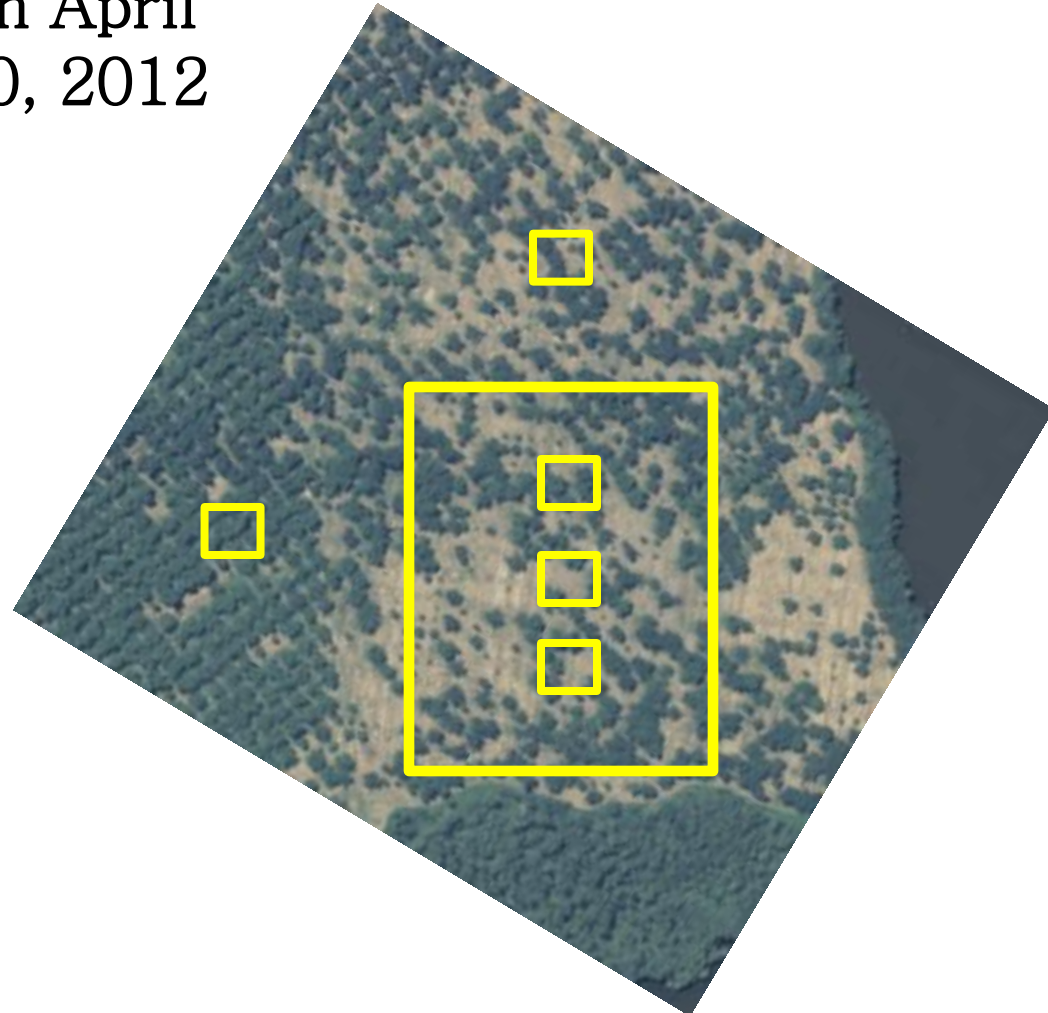
Each Square is 4x4 trees

April 24

nt

Traps out
on April
10, 2012

34	11	14	13	6
34				9
11		0		14
0				9
16		8		8
0				7
19		13		10
11				14
	13	4	1	3



nt

Mann-Whitney U-test statistics

Z = 0.8857 P = 0.3758

P. imbricornis trap catch at Crisp Co.

May 11

34

20 trees

36 trees

113	64	65	16	30
37				14
15		118		27
16				22
17		47		8
47				17
127		15		12
24				11
	17	8	27	11

33

18

May 25

4

20	4	14	18	6
15				0
14		6		6
11				9
0		2		8
3				5
8		7		12
0				3
	5	1	9	14

Mann-Whitney U-test statistics
 $Z = -0.3618$ $P = 0.7175$

Mann-Whitney U-test statistics
 $Z = -1.5307$ $P = 0.1259$

P. imbricornis trap catch at Crisp Co.

June 2

8

25	22	21	14	18
23				42
12		1		35
43				23
13		0		16
21				5
19		2		32
22				6
	16	12	11	32

5

June 15

32

13	23	6	0	33
37				14
15		5		6
16				4
17		0		0
12				2
10		0		5
4				16
	18	12	1	2

20

Mann-Whitney U-test statistics
 $Z = -2.7717$ $P = 0.0056$

Mann-Whitney U-test statistics
 $Z = -1.9723$ $P = 0.0485$

P. imbricornis trap catch Crisp Co.

July 24

0

1	0	6	2	0
2				0
0		0		0
0				0
1		0		0
3				0
3		0		0
1				0
	2	1	1	0

3

September 18

0

4	0	0	0	3
0				0
8		0		0
0				0
0		0		0
0				0
0		0		4
0				0
	10	2	0	3

0

Mann-Whitney U-test statistics
 $Z = -1.3969$ $P = 0.1625$

Mann-Whitney U-test statistics
 $Z = -1.8841$ $P = 0.0596$

Total trap catch by beetle species

All Season

Prionus imbricornis 78

210	124	126	63	96
148				79
75		25		88
86				67
64		57		40
86				36
186		30		72
62				50
	81	39	50	65

79

----- Mann-Whitney U-test statistics
 Z = -2.3684 P = 0.0179

All Season

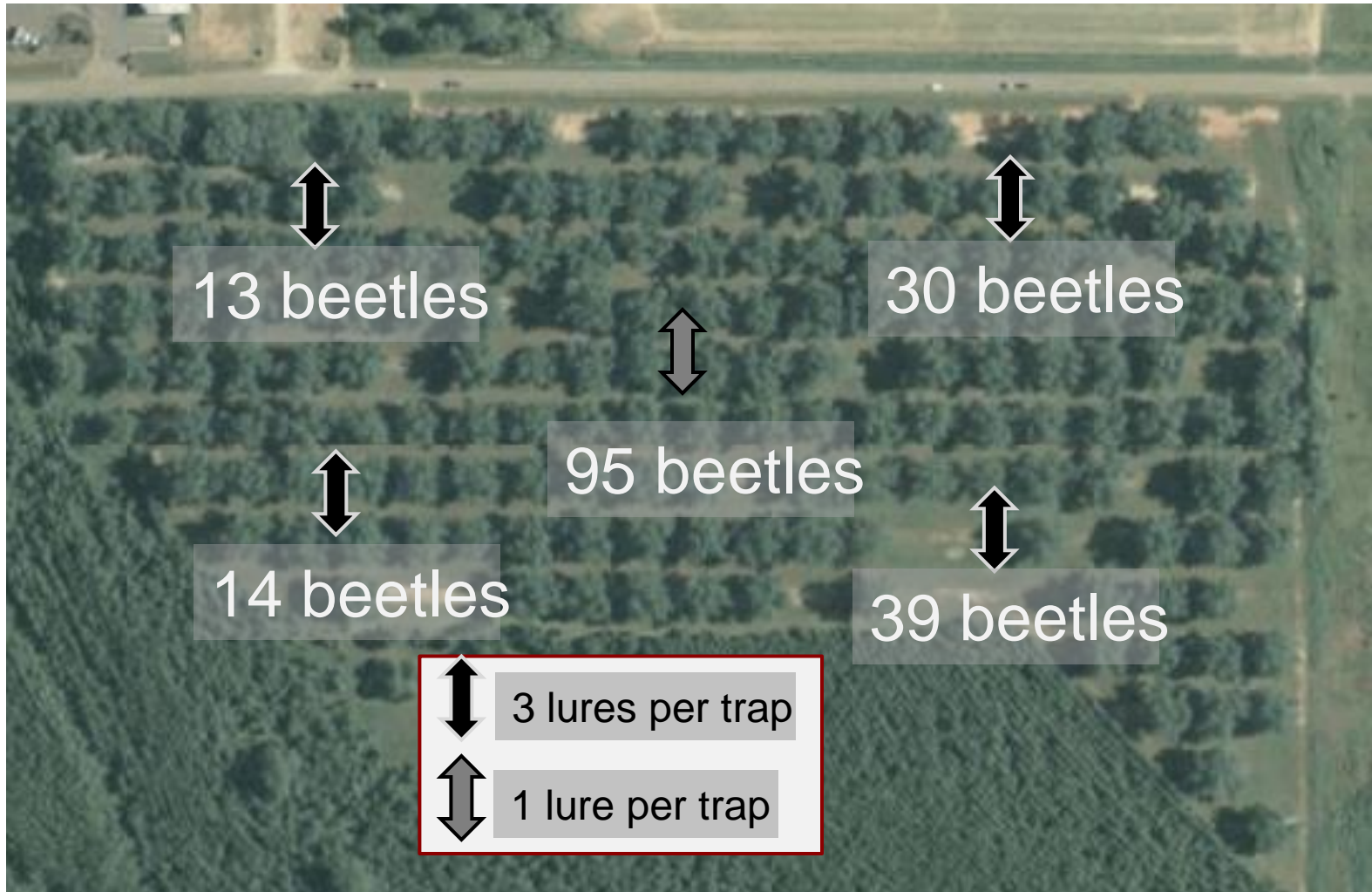
Prionus laticollis 8

5	0	3	4	2
0				14
4		0		2
11				1
1		0		0
2				17
5		0		1
0				0
	0	1	3	4

5

----- Mann-Whitney U-test statistics
 Z = -2.0974 P = -.0360

24-acre Peach Co. Orchard - 2012 Season



► Source of map: Google Earth 2013 Digital Globe

Alpha-pinene baited pitfall traps with Insect-o-Slip[®] treated inner walls

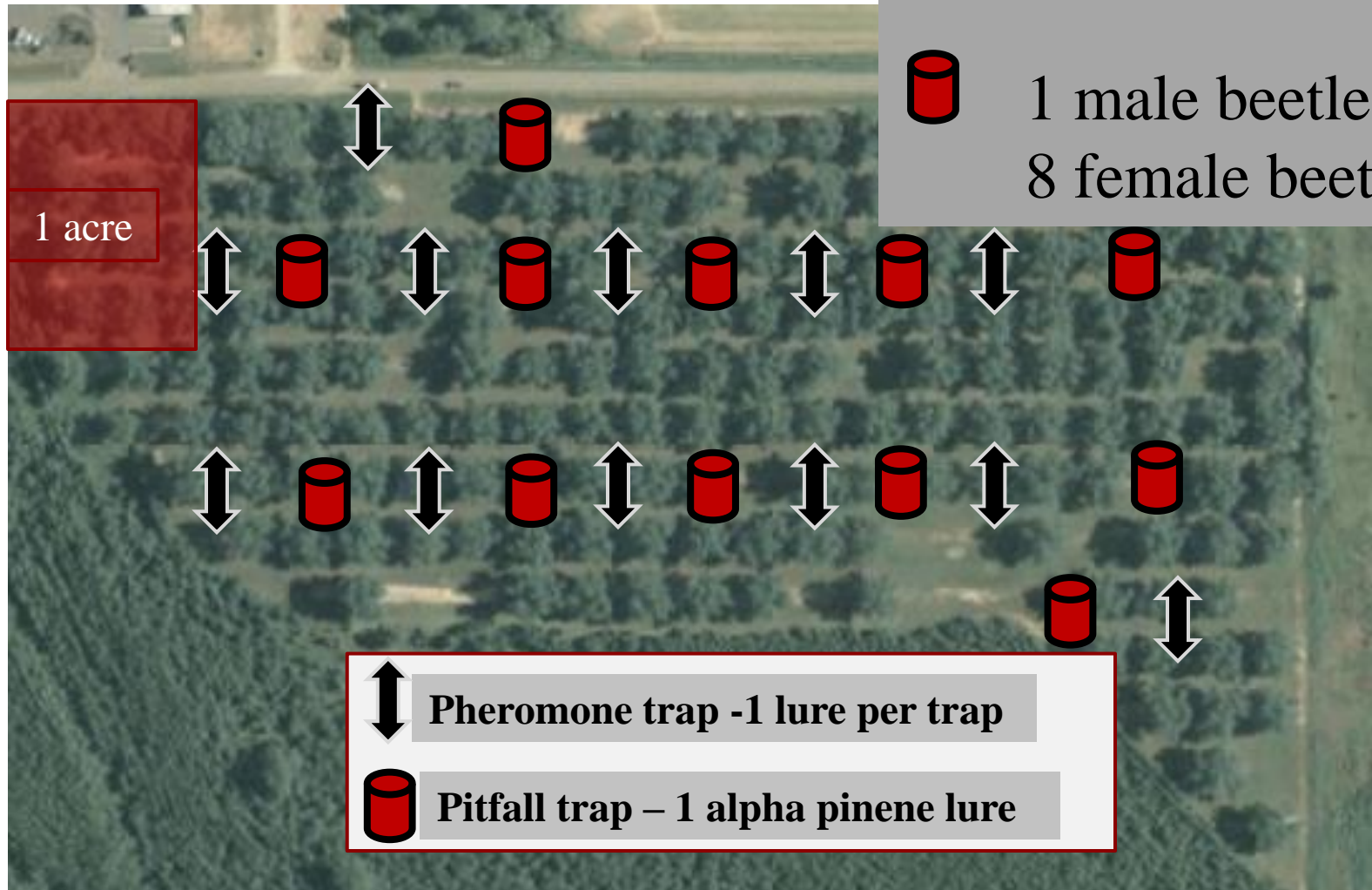


Alpha-pinene attracts
female *Prionus* beetle.

Live female remains in trap
one week and the number
of males is recorded.



Peach Co. Orchard – 2013

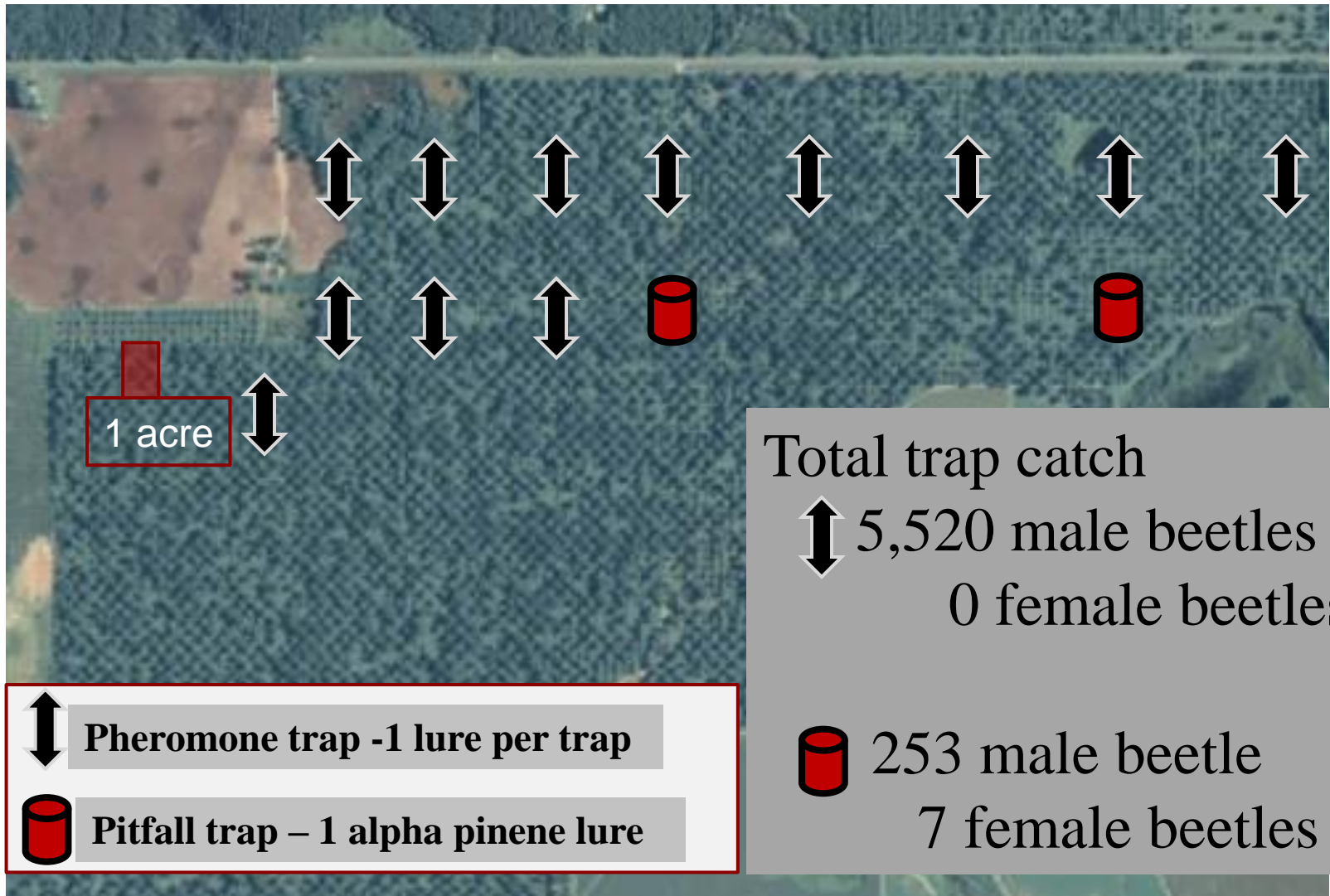


Total trap catch

↑ 596 male beetles
↓ 0 female beetles

🔴 1 male beetle
8 female beetles

Nilo Plantation, Albany, GA -2013



► Source of map: Google Earth 2013 Digital Globe

Summary and Conclusions

1. Tilehorned prionus (98% of beetles sample) and broadnecked root borer adult males were attracted to the California prionus pheromone lures in Georgia pecans from late April thru July.
2. One pheromone lure will last for at least 6-7 weeks.
3. Chlorpyrifos at the ant-control rates as a soil application has a 93% efficacy against the adult male beetles.
4. Peripheral traps collected more adult males than traps in the center of 60 acre orchard encircled by pheromone-baited traps.
5. No males were attracted to live females in pitfall traps among pheromone-baited traps at a density of 1 to 2 females per 1000 males. Males were attracted to live females in pitfall traps at a density of 1 to 2 females per 1000 males.

Plans for 2014



Source of map: Google Earth 2013 Digital Globe

Acknowledgement

- Cooperating Pecan Growers and Agent:
 - Nilo Plantation (Mitchell Co.)
 - Cannon Farms (Crisp Co.)
 - Lane Packing Co. (Peach Co.)
 - Wade Farms (Fitzgerald, GA)
 - UGA Coop. Extension – Scott Carlson (Ben Hill Co.)
- Student Workers: Jamie Wilson, Paul Tyson
- Funding: Georgia Agricultural Commodity Commission for Pecans, Cannon Farms
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