Breeding for silk fly resistance in sweetcorn

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Silk resistance in sweetcorn

Silk fly mapping population in field corn with USDA

Leaf and ear resistance in field corn

Inbred Silk Fly Resistance Trial
Fall 2016

ZC sh_2

M5-2

M5-1

9EC

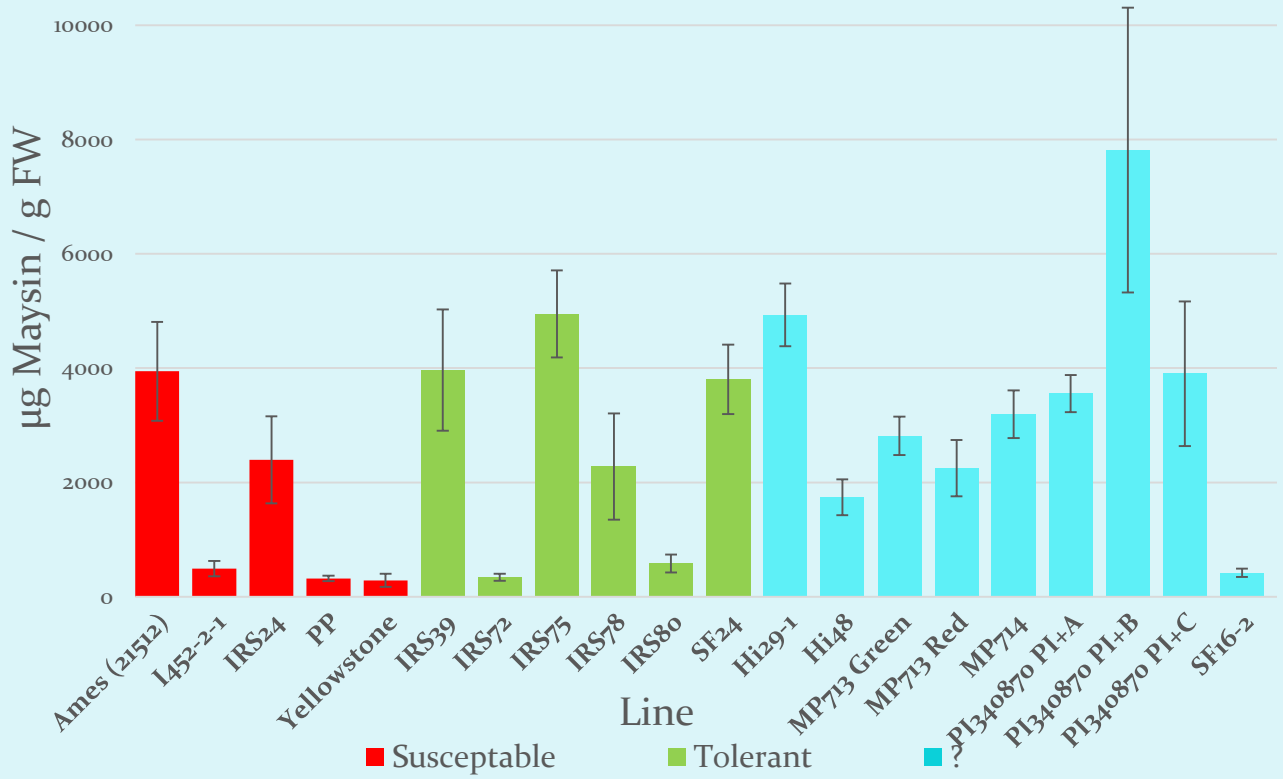
Silk Fly Inbred Test

Fall 2016

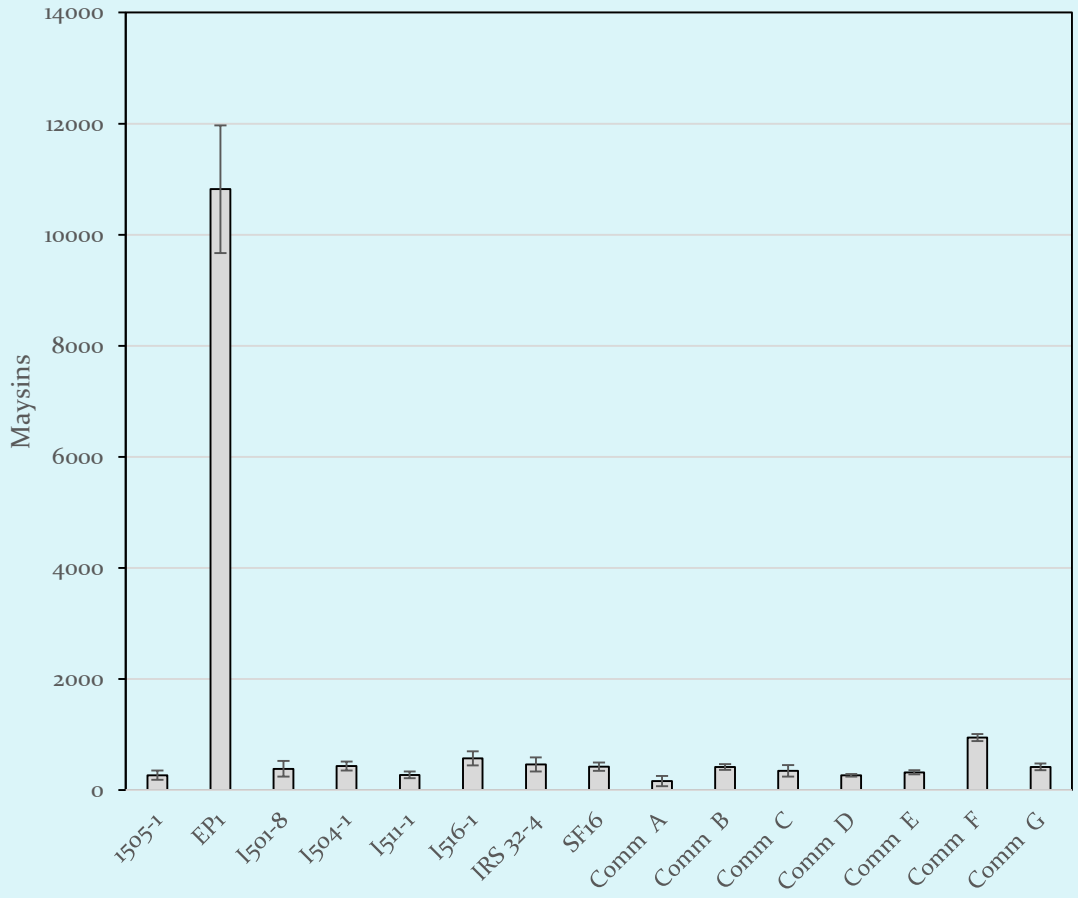
Line	Silk Fly Rating*	% Ear Damage
ZC sh2	1.63c	4.53b
M5-2	2.77c	6.68b
M5-1	3.45bc	6.28b
9EC	4.88a	39.69a

* Rated from 0-5 with 0 (no damage) and 5 (damage to bottom half of ear)

Maysin levels in some sweet, field and popcorns



Maysin Levels in some sweet and pop corns



Maysin probably is not the answer

No sweetcorn lines do not preformed well under high silk fly pressure

Other factors like Phorid flies affecting results

Phorid Fly

Silk Fly

Phorid Fly

Difficult to produce
good quality seed

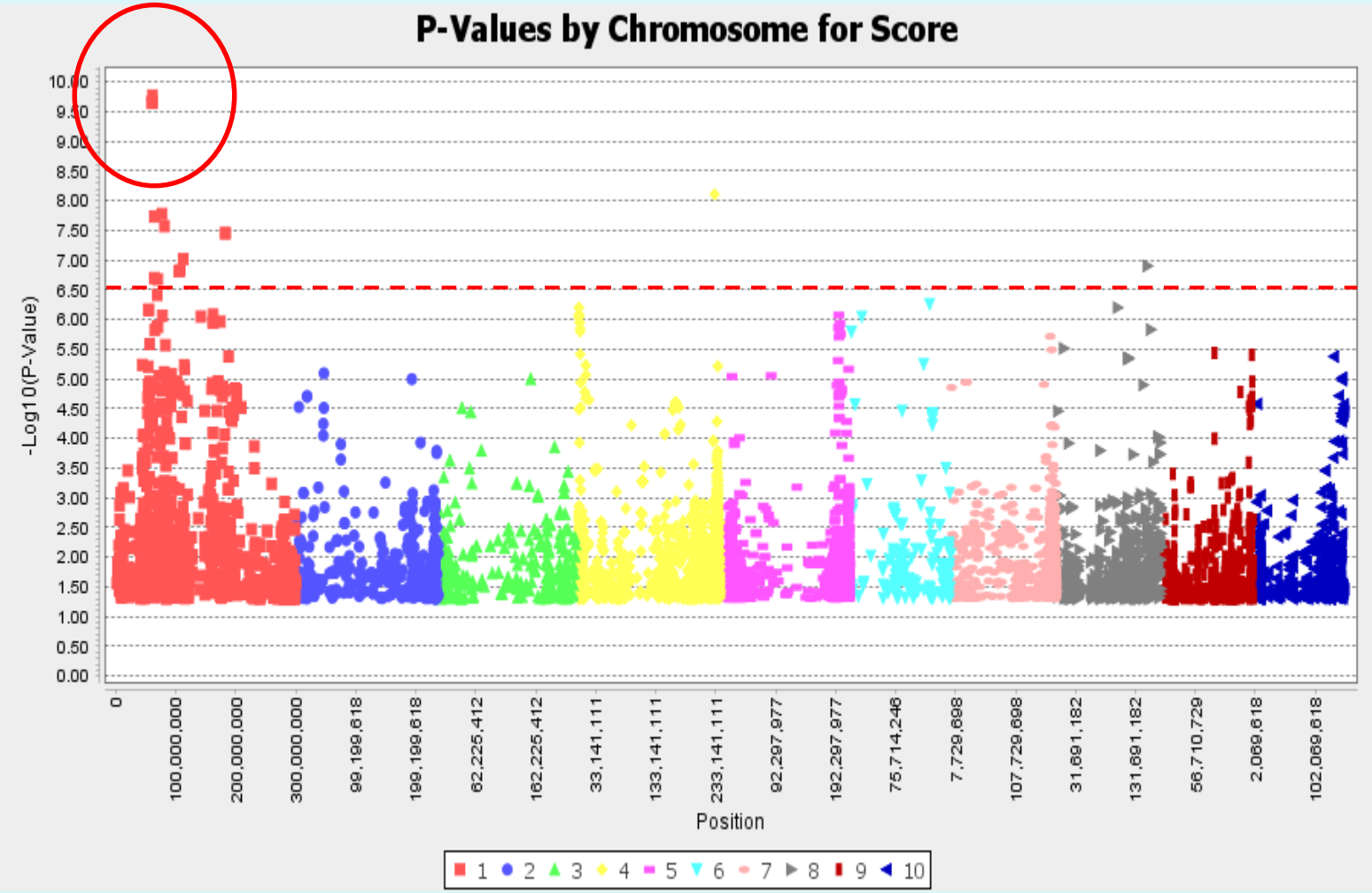
Silk fly mapping population in field corn with USDA

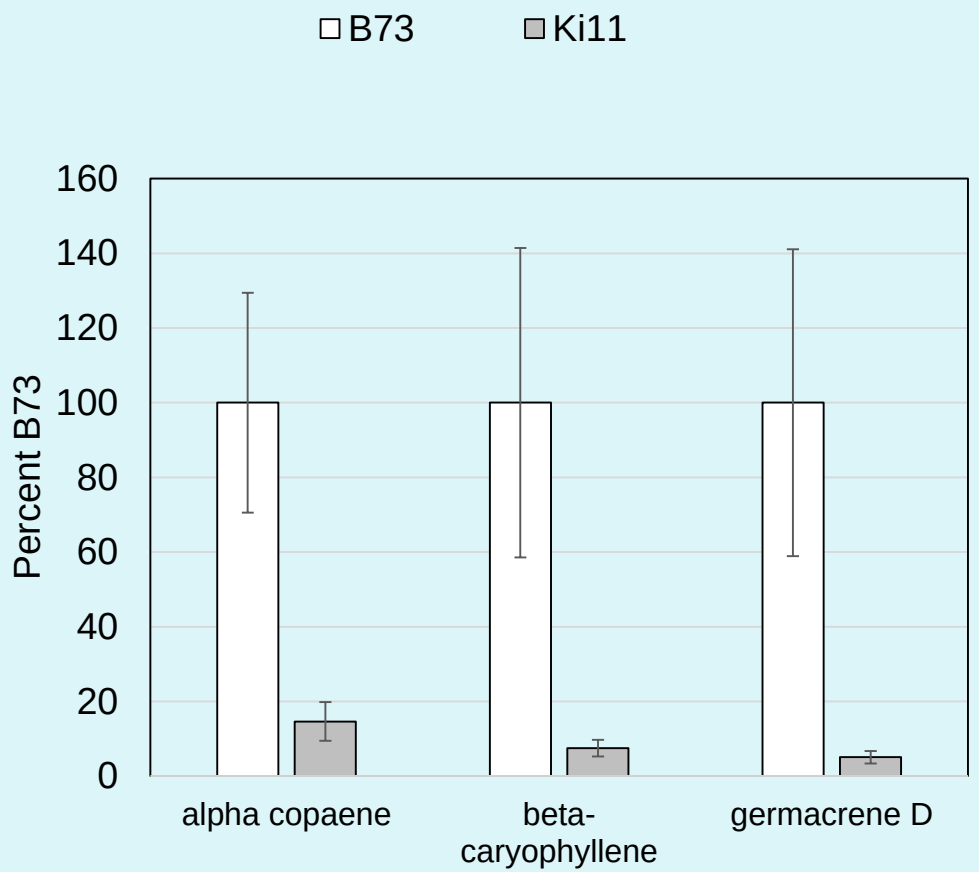
With Anna Block USDA-ARS Gainesville, FL.

Funded by FDACS Specialty Crops Block Grant

Goal: use maize recombinant inbred lines to map for genes that may confer silkfly resistance/tolerance

- Initial trial identified 4 parental lines to use in future mapping trails
- 2 mapping populations have been run and scored for silkfly resistance.
- Genome-wide association (GWAS) analysis was performed from the first mapping population and a potential loci of interest was identified.


P-Values by Chromosome for Score
-Log10(P-Value)
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0
100,000,000
200,000,000
300,000,000
99,199,618
199,199,618
62,225,412
162,225,412
33,141,111
133,141,111
233,141,111
92,297,977
192,297,977
75,714,246
7,729,698
107,729,698
31,691,182
131,691,182
56,710,729
2,069,618
102,069,618
Position
1 2 3 4 5 6 7 8 9 10


B73
Ki11
160
140
120
100
80
60
40
20
0
Percent B73
alpha copaene
beta-caryophyllene
germacrene D

- Test if these compounds can be used for silkfly monitoring
- Develop molecular markers to facilitate the rapid movement of this gene (allele) into commercially viable sweetcorn.
- Make sure not a flavor component of sweetcorn

Leaf and ear resistance in field corn

Maize Strip

Corn Stunt