



Does it make sense to breed
blueberries for bees?

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Blueberry Pollination Improvement?

- Blueberry pollination challenged by
 - agricultural model,
 - floral morphology, and
 - bee behaviour



Fotagenic; flickr.com

- Could improvements be made through selection of floral chemical characteristics important to pollination?

Blueberry Breeding & Genetics

- Rabbiteye, lowbush, Southern and Northern highbush
- Breeding began 1909 with three accessions
- Tetraploid
- Easy hybridization
- Early acting inbreeding depression



<http://www.ablueberryinn.com>

Inheritance Pattern

- Does highbush blueberry exhibit a tetrasomic or intermediate inheritance pattern?
- Useful for breeding programs
- Implications for inbreeding and heterozygosity
- 5 controlled crosses with 30 offspring, genotyped with SSR loci

Pedigree Inbreeding Coefficients and Heterozygosity

- Is there a relationship between pedigree inbreeding coefficients and heterozygosity?
- Are highbush blueberries inbred or outbred?
- Inbreeding or outbreeding may impact floral traits including chemistry.
- Constructed pedigrees and SSR loci

Floral Chemistry and Bees

- Types of compounds
 - Most common classes are: Aliphatics, Benzenoids and Phenylpropanoids, and Terpenes (Knudsen *et al.* 2006 - 'Diversity and Distribution of Floral Scent')
- Attractant versus deterrent
- Species taste different



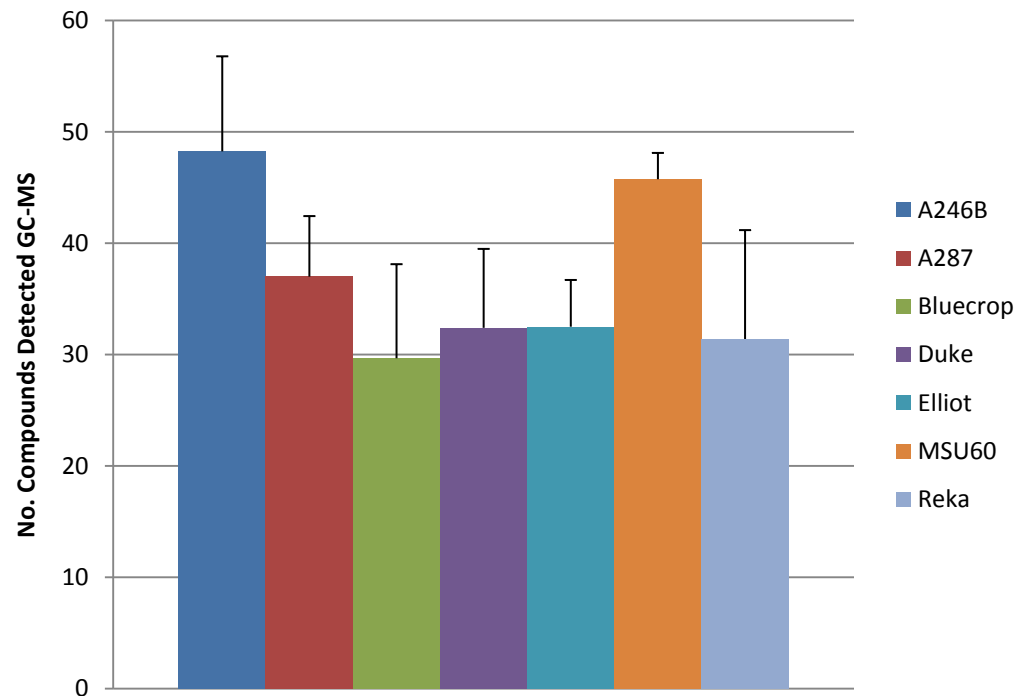
MSU pamphlet;
<http://www.ipm.msu.edu/cat06fruit/pdf/PollinationDay2006.pdf>

Blueberry Floral Chemistry

- What is the variation within selected floral chemical traits?
- Without variation, there are no opportunities for breeding.
- Whole flower cluster, nectar, and pollen chemical characteristics

Cut Flower Volatiles

- Preliminary Results
- Beta myrcene:
A-246B, A-287, MSU60
- other unidentified
terpenes



Bee Monitoring & Bioassays

- Are some genotypes visited more often than others?
- Which compounds act as attractants or deterrents?
- If the scent does not influence bee behaviour, there is no need to consider the scent in breeding programs.

Thanks!