Comparison of hybridization techniques in chickpea

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Objective

Evaluate variations in cross pollination techniques in chickpea

Justification

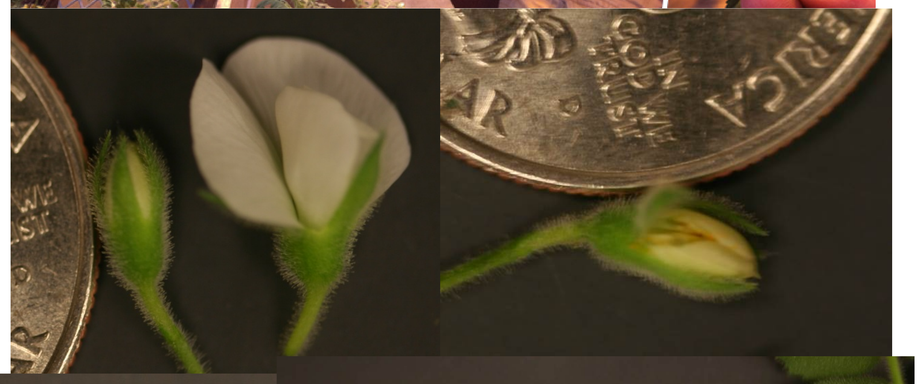
- Chickpea cross pollination is tedious and inefficient
- Anecdotes describe several variation in technique
- No peer reviewed reports testing variations in techniques
- Optimized protocol = better resource allocation

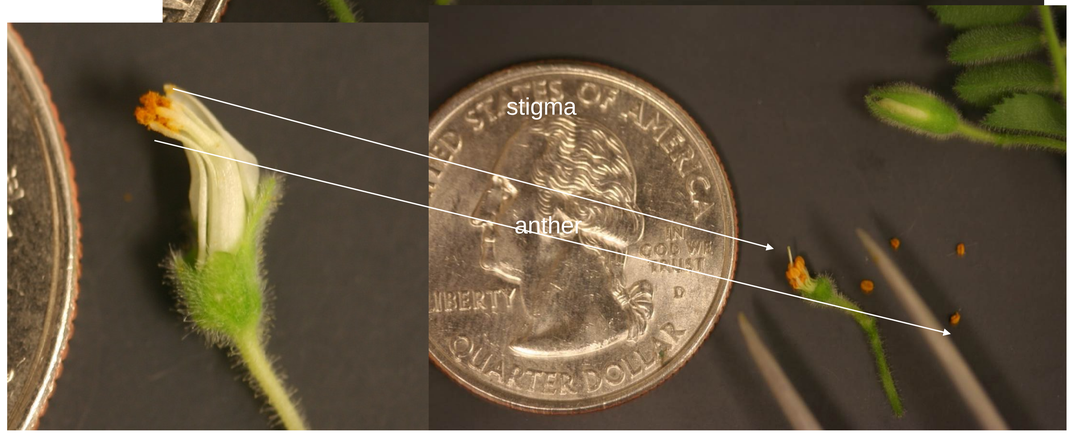
Abstract

Four combinations of pollination methods in chickpea were tested in order to evaluate the efficacy of plant growth regulator treatments and emasculation for successful hybridization. The failure or successful generation of confirmed viable hybrids was the only response variable considered. The author made pollinations in two field environments and one greenhouse environment at Minot, ND, in 2014 and 2015. Results indicate that emasculation and hormone treatment do not improve manual hybridization in chickpea.

Materials and Methods

- Pollination techniques
  - emasculation/no emasculation
  - PGR application/no PGR application
- Environments
  - Greenhouse NCREC – Minot, ND
  - Field NCREC – Minot, ND
- 26 genotypes
  - 20 white flower/compound leaf
  - 5 white flower/simple leaf
  - 1 purple flower





Results

Successful Hybridizations

- Emasculated – 9.0%
- Not emasculated – 14.5 %

  Chi-square 9.98**
- PGR treated – 13.0%
- No PGR treatment – 10.5%

  Chi-square 2.07

** = $p < 0.001$

Conclusion

Hormone treatment and emasculation as applied in this experiment, do not improve hybridization efficiency and can only be viewed as a source of wasted resources.

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