

## **Update: Soybean Improvement with Insect Resistance**

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The insect resistance project in 2019 had three goals:

1. Make progress towards breeding a resistant cultivar
2. Make progress towards combining genetics discovered by this project (QTLs N and O) with previously known QTLs M and E
3. Follow up on potential new sources of resistance identified in 2018: PI 366122, PI 407156, and PI 407286

Progress was made on each of these goals as follows:

1. The resistant cultivar is still in development and qualifies for a separate funding source since it has progressed to yield trials and is close to release. This goal will progress as a separate project from now on independently of the GACCS.
  - Professors Parrott, Li, and All would like to thank the commodity commission for support in the early stages of cultivar development.
2. Pending marker validation, the final backcross was made in 2019 to combine QTLs N and O with QTLs M and E. Soybean lines carrying new QTL combinations will be ready to be tested in the fall of 2021 or spring of 2022 depending on the timing of seed increases.
  - This testing will inform further resistant cultivar development and will provide multiple resistance sources to enable a rotation strategy. Rotating resistance sources will protect the investments of the commission by providing a sustainable crop protection system based on genetics to minimize pesticide and scouting input costs.
3. Greenhouse and lab assays are almost finished to supplement field data from 2018 that suggests PIs 366122, 407156, and 407286 are resistant to defoliating insects and do not carry QTLs M, E, N, or O. Field data from 2018 was from a natural infestation of Mexican bean beetle and greenhouse and lab assays are being carried out with soybean looper.
  - This represents a final search for important genetics for defoliating insect control to combine with current QTLs.