Introduction
- Over half of the nation’s cotton is planted in Texas with 4 million acres residing in the Texas High Plains region (Plains Cotton Growers 2019). Since 2011, glyphosate resistant Palmer amaranth has threatened Texas cotton production.
- Cotton producers may have the opportunity to utilize isoxaflutole, an HPPD inhibiting HRAC Group F2 herbicide, in their weed management programs in the next few years.

Objectives
- Examine response of HPPD tolerant cotton to isoxaflutole applied preemergence or early postemergence.
- Evaluate weed management systems that incorporate isoxaflutole into local weed management programs.

Hypotheses
- Little or no crop response will be observed when isoxaflutole is used in HPPD tolerant cotton systems.
- Incorporating isoxaflutole into cotton weed management systems will provide effective weed management programs.

Materials and Methods
- Locations:
  - Crop Response Trials (2019 & 2020)
    - Texas Tech Research Farm, New Deal, TX
      - Pullman sandy clay loam; 8.2 pH; 1% OM
    - BASF Research Farm, Lubbock, TX
      - Amarillo fine sandy loam; 8.4 pH; <1% OM
  - Weed Management Trial (2019 & 2020)
    - Texas & A&M AgriLife Research Center, Halfway, TX
      - Pullman clay loam; 8.1 pH; <1% OM
  - Plot Size: 4 x 7.6 m
  - Experimental Design: Randomized Complete Block
  - Four replications
  - Application Timings:
    - PRE – preemergence
    - EPOST – 2- to 4- leaf cotton
    - MPOST – square to bloom
    - PDIR - bloom
  - Herbicide Rates:
    - Isoxaflutole – 0.1 lb ai/a
    - Prometryn – 0.6 or 1.2 lb ai/a
    - Pendimethalin – 1.0 lb ai/a
    - Fluometuron – 1.0 lb ai/a
    - Dimethenamid – 0.75 lb ai/a
    - S-metolachlor – 1.25 lb ai/a
    - Glufosinate – 0.78 lb ai/a
    - Glyphosate – 1.55 lb ai/a
    - Dicamba – 0.5 lb ae/a
    - Diuron – 1.0 lb ai/a
  - Data were analyzed by SAS version 9.4 using Proc GLIMMIX, Tukey’s HSD α=0.05.
  - Cotton response data were combined across years at New Deal but separated at Lubbock due to replanting cotton from severe weather in 2020. Palmer amaranth control data at Halfway were combined across years.

Conclusions
- Cotton response was greatest early season but never exceeded 14%, with the treatment exhibiting the highest response being isoxaflutole + prometryn applied PRE at Lubbock in 2019. Data not presented.
- For all treatments at New Deal and Lubbock, cotton density and lint yield were similar to the nontreated weed-free control.
- Fourteen days after the PRE application, all treatments controlled Palmer amaranth 94-100% except for prometryn (90%).
- Twenty-one days after the EPOST application, all treatments controlled Palmer amaranth >90%. Treatments containing isoxaflutole in the PRE application controlled Palmer amaranth 98-100% while treatments containing isoxaflutole in the EPOST application controlled Palmer amaranth 94-96%.
- When evaluated 10 days after the PDIR application, treatments that did not receive PDIR application were up to 11% less effective at controlling Palmer amaranth.
- Fail to reject both hypotheses. Future research should include examining the use of other HPPD inhibitors and improved HPPD tolerant cotton germplasm.

International Survey of Herbicide Resistant Weeds weedicence.org

Contact Information
Delaney Caitlin Foster
Texas Tech University
Delaney.Foster@ttu.edu