## Results

- Qualitative differences in growth characteristics were conspicuous for April or May planted cotton (Fig. 1).
- Though not quantified, cotyledon size was noticeably impacted by cultivar on the early planting dates (April planting date, 21 DAP shown in Fig. 1A), where cotyledon size increased with planting seed mass. 1 = lightest seed (Upland); 2 = intermediate weight seed (Upland); 3 = heaviest seed (Pima).
- Differences in whole-crop growth between cultivars was apparent as the early crop canopy was substantially leafier at 21 DAP for the largest seeded cotton (3) than for the smallest seeded cotton (1).
- When differences in first true leaf (FTL) area were observed, the heaviest planting seed (C) produced the greatest first true leaf area (FTLA).

## Discussion

- Planting seed from cotton cultivars known to differ substantially in seed mass exhibited significant differences in first true leaf size, photosynthetic processes, seedling vigor (predominantly seedling dry weight), and whole-crop growth indices.
- First true leaf area is more important in determining seedling vigor than single leaf photosynthesis because the cultivar with the greatest plant DW and whole plant leaf area also had the largest first true leaves (Table 2). By comparison, first true leaf photosynthetic rates were either unaffected by cultivar or lowest in the most vigorous cultivar (Table 3).
- Similarly, whole crop leaf area development (LAI) was more important in determining crop growth rates than net assimilation rates, indicating that the total leaf area available to intercept incoming solar radiation is the dominant driver of early crop growth rather than photosynthetic efficiency of the canopy.

## Future Research

- To verify the seedling vigor and crop growth responses of cultivars differing in seed mass and first true leaf characteristics, the study will be conducted again during the 2018 season.

Analyses of plant pigments, oxidative stress, and ROS scavenging enzyme activity are ongoing to determine what role these factors play in promoting seedling vigor under early season conditions.

## Citations


## Acknowledgments

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