EVALUATION OF THREE CULTIVARS OF GLANDLESS COTTON IN NEW MEXICO

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Abstract

A trial comparing three cultivars of glandless cotton (Acala-GLS, STV-Glandless and JACO-Glandless) was conducted in Las Cruces, NM during 2012 growing season. Measurements that were taken included plant population, plant height, and average number of open bolls. Seedcotton, lint and cottonseed yields were measured at harvest. Results show no statistically significant difference between the three cultivars in plant population after establishment, plant height and the average number of open bolls. Seedcotton, lint and cottonseed yields were also not significant between the cultivars. Lint yield for STV-Glandless was 979 Ib/acre; for Acala-GLS was 1063 Ib/acre and for the JACO-Glandless, it was 1189 Ib/acre. Seed yield was 0.71 t/acre for STV-Glandless, 0.77 t/acre for Acala-GLS and 0.90 t/acre for the JACO-Glandless.

Introduction

Seeds from the glandless cotton, in contrast to those from conventional cotton, have negligible quantities of gossypol, a phenolic aldehyde that is toxic to organisms with a simple stomach. Glandless cottonseed has the potential to be used for developing food and feed products that have been limited in conventional cottonseed, which is generally fed to ruminants in regulated quantities. However, due to greatly reduced gossypol content in the glandless cotton plant tissues, these plants are more susceptible to chewing and sucking insects (Benedict et al., 1977; Jenkins et al., 1966). Some instances of vertebrate pest damage to the opened bolls have also been reported. Consequently, the glandless cotton cultivars are more challenging to produce especially in environments with greater pest pressure. Most cotton growing areas of New Mexico generally have low pest pressure, and may provide an ideal environment for growing glandless cotton.

Objectives

To evaluate and compare the growth and yield of three glandless cotton cultivars for their adaptability to the environment of New Mexico.

Methods and Methods

This trial involved three glandless cultivars (Acala-GLS, STV-Glandless, and JACO-Glandless). The site for the trial was the New Mexico State University Leyendecker Plant Science Center in Las Cruces. Planting was done on 40 inches spaced beds and furrow irrigated. Other cultural practices were according to those prescribed by the New Mexico State University. Planting date was in April 2011 and the cotton harvest was in November 2012.
The experimental design was a randomized complete block design with the treatment combinations replicated four times.

Data collection included 25 matured bolls from each plot (2 bolls/plant) for seed/lint ratio and fiber quality determination. Quantitative field yield was assessed on each plot by harvesting two rows, 20 feet long.

Results and Discussion

The three cultivars of glandless cotton evaluated were not significantly different in plant height at 8, 12, and 20 weeks after planting. However, the trend shows the JACO-Glandless to be a relatively shorter cotton cultivar than the rest (Figure 1). Plant population and average number of bolls between the three cultivars were not significantly different (Figures 2-3). All the glandless cultivars tested were all well established, with no noticeable signs of pests or diseases attacking the seedlings.

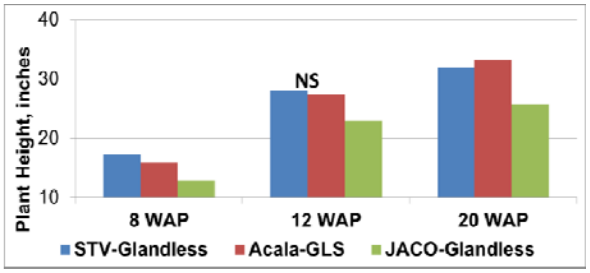

Figure 1. Plant height of the three glandless cultivars.

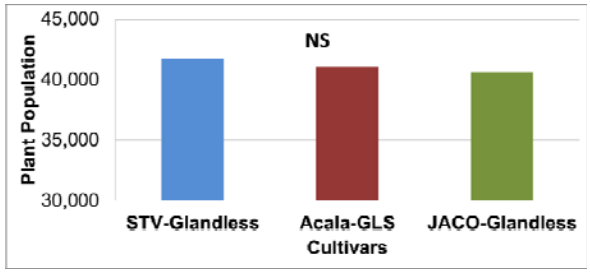

Figure 2. Plant population of the three glandless cultivars.

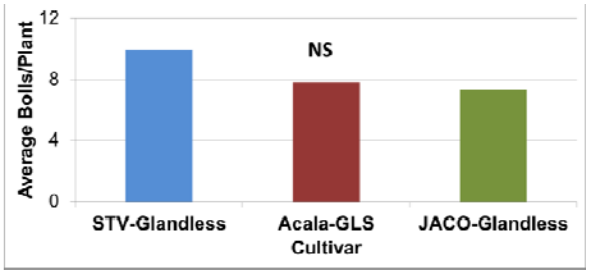

Figure 3. Number of open bolls of the three glandless cultivars.

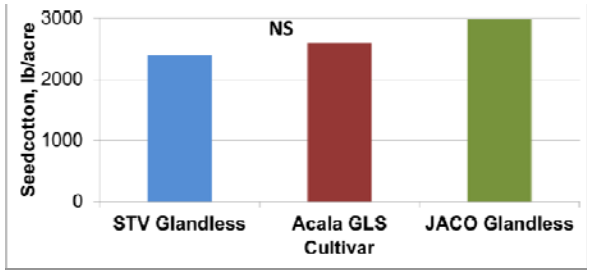

Figure 4. Seedcotton yield of the three glandless cultivars.

Seedcotton, lint and cotton seed yields were not significantly different among the glandless cultivars tested (Figures 4-6). Lint yield for STV-Glandless was 979 lb/acre; for Acala-GLS was 1063 lb/acre and for the JACO-Glandless, it was 1189 lb/acre. Seed yield was 0.71 t/acre for STV-Glandless, 0.77 t/acre for Acala-GLS and 0.90 t/acre for the JACO-Glandless.

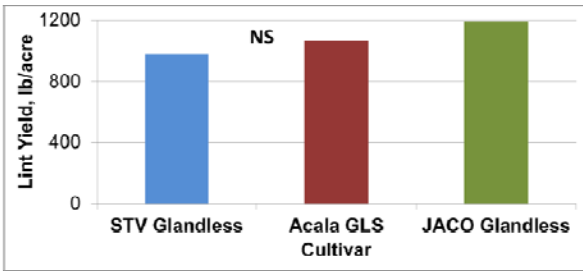

Figure 5. Lint yield of the three glandless cultivars.

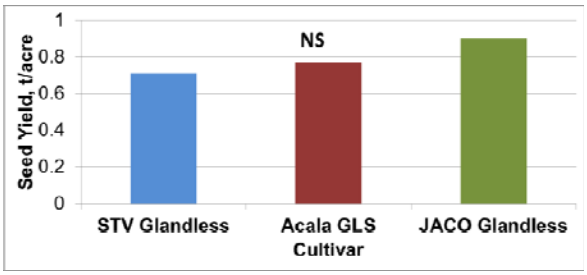

Figure 6. Cotton seed yield of the three glandless cultivars.

Conclusions

This study indicates that the three glandless cultivars that were tested appear promising within the New Mexico environment. Additional trials will be necessary to evaluate the agronomic performance of these glandless cultivars and possibly fine-tune the cultural practices that will make them more productive in New Mexico environment.

References

Benedict, J.H., T.F. Leigh, W. Tingey, and A.H. Hyer. 1977. Glandless Acala cotton: more susceptible to insects. Calif. Agric. 31: 14-15.

Jenkins, J.N., F.G. Maxwell, and H.N. Lefever. 1966. The comparative preference of insects for glanded and glandless cotton. J. Econ. Entomol. 59: 352-356.