Planting Date and Fertilizer Rate Effects on Selected Cotton Cultivars in New Mexico.

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Introduction

Optimizing agronomics for cotton production continues to be an important activity, especially with the release of new cotton cultivars and specialty cultivars without gossypol.

Two important issues that need to be addressed include the nitrogen fertilization and appropriate planting dates. Most NM farmers typically plant cotton when the 4" soil temperature reaches 65F. However, seeds of some newly released cotton cultivars may be able to withstand slightly lower soil temperatures at the beginning of the season without necessarily experiencing yield reductions. In such a case, farmers can enjoy greater flexibility with their planting operation.

Additionally, nitrogen requirements for these new cultivars may be different from the previously released cultivars.

Therefore, agronomic studies are needed to fine-tune cultural practices suitable for these new cultivars in different cotton production zones of NM, thus optimizing yields and profitability.

Objectives

To evaluate and test the response of two transgenic cotton cultivars (PHY 375 WRF and PHY 499 WRF) and two traditional cotton cultivars (Acala 1517-08 and Acala-GLS) to:

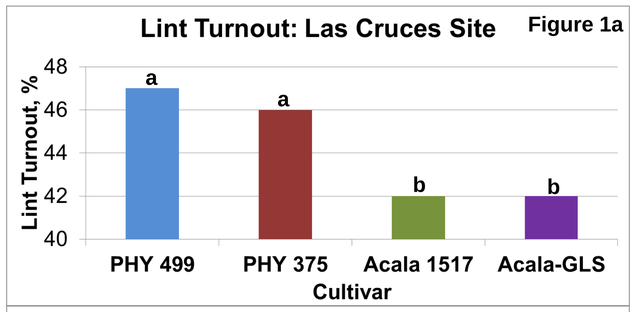
i. different planting dates and
ii. different nitrogen application rates

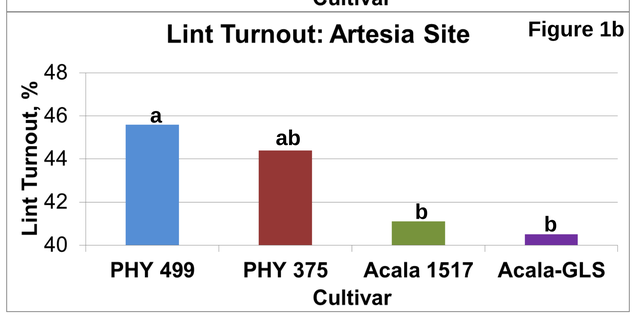
Methods

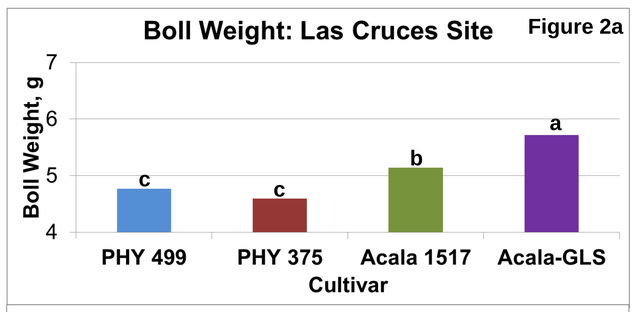
Agronomic Evaluation

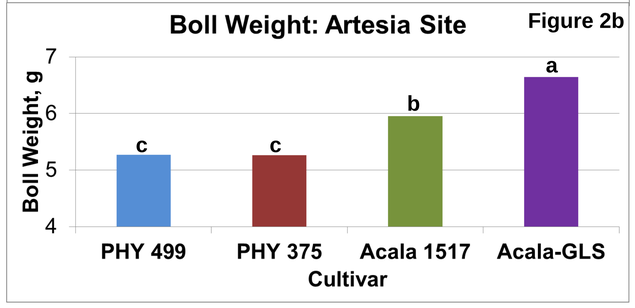
- Trials involved four cotton cultivars (PHY 375 WRF, PHY 499 WRF, Acala 1517-08 and Acala-GLS).
- Sites for testing included NMSU Leyendecker Plant Science Center in Las Cruces and NMSU Agricultural Science Center in Artesia
- Row Spacing: 40 inches spaced beds.
- Irrigation: Furrow irrigated at Las Cruces site and combined furrow and sprinkler irrigation in Artesia.
- Fertilizer rates: 100 lb N/acre or 200 lb N/acre was applied depending on treatments
- Planting dates:
  - Las Cruces site - April 13, April 27 and May 16, 2012.
  - Artesia site - May 3, and May 21, 2012.
- Harvest:
  - Las Cruces site: November 12-13, 2012.
  - Artesia site: November 8-9, 2012.
- Experimental design: Split-split plot design with planting date as the main plot, cultivar as the subplot and fertilizer rate as the sub-subplot. The experimental units were replicated four times.
- Data collection: 25 matured bolls were collected from each plot (2 bolls/plant) for seed/lint ratio and fiber quality determination. Quantitative field yield was assessed on each plot by harvesting 2 rows, 20 feet long.

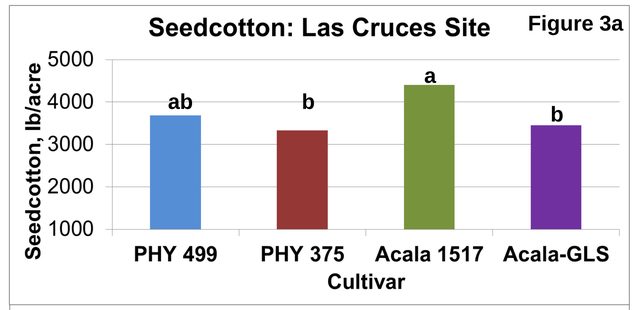
Results

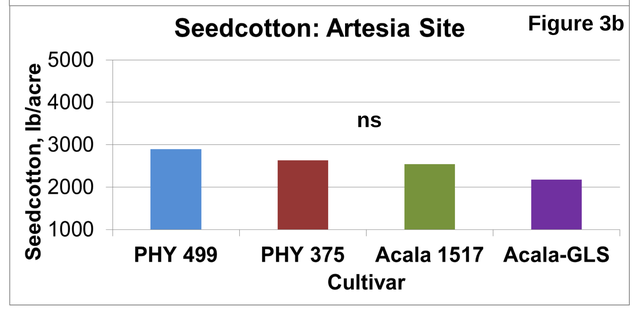


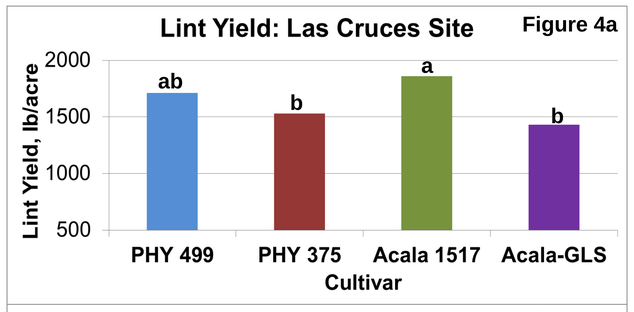


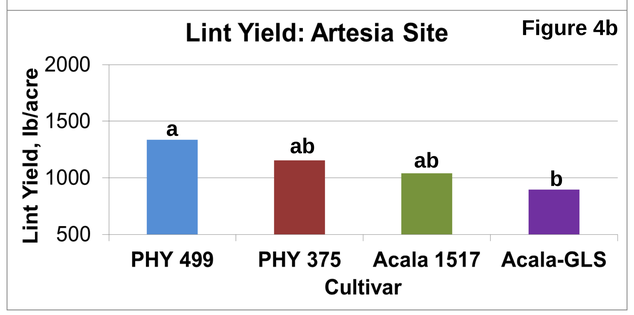


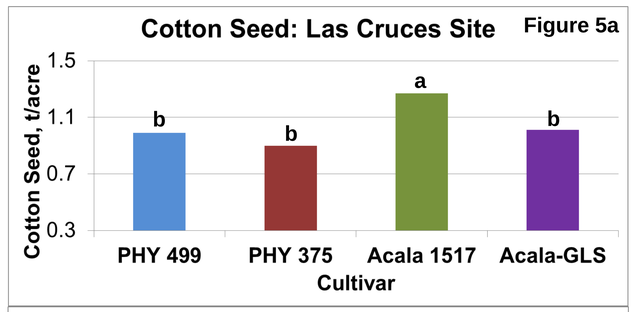


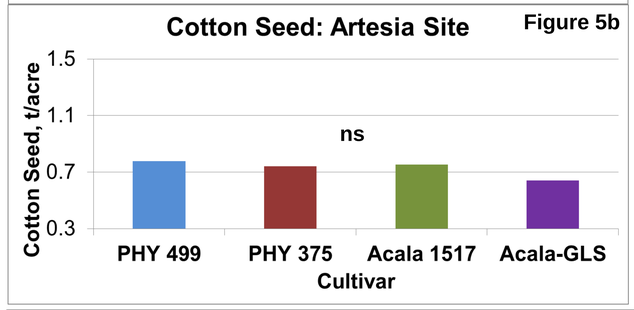












Conclusions

- A preliminary study investigating the effects of planting dates and nitrogen rates on four cotton cultivar (PHY 375 WRF, PHY 499 WRF, Acala 1517-08 and Acala-GLS) in NM indicate a strong cultivar effect on growth and yield at two study sites (Artesia and Las Cruces, NM)
- The effect of planting date and fertilizer rate were not significant for many of the yield parameters measured at both sites.
- The yield parameters of the cultivars tested were generally higher in Las Cruces than in Artesia.
- The trial will be repeated next year to evaluate the treatment effects.

- There was significant effect of cultivar on the lint turnout at both trial sites. The lint turnout of the Phytogen cultivars were generally higher than the traditional cultivars (Fig.1a-b).
- On the other hand, the boll weights of the traditional cultivars (Acala-GLS & Acala 1517) were more than those of the Phytogen varieties tested at both sites (Fig. 2a-b).
- Seedcotton yields were not significantly different between the cultivars in Artesia, but in Las Cruces, the seedcotton yield of the Acala 1517 was significantly higher than PHY 375 and Acala-GLS, but not significantly different from PHY 499 (Fig 3a-b).
- The lint yields were significantly different between cultivars at both sites. In Las Cruces, PHY 499 and Acala 1517 yields were not significantly different, while PHY 375 and Acala-GLS had significantly lower yields than Acala 1517. In Artesia, the yields of PHY 499 was the highest and significantly more than the Acala-GLS. However, lint yields of PHY 375 and Acala 1517 were not significantly different from PHY 499 (Fig. 4a-b).
- Cotton seed yields were not significantly different in Artesia, but in Las Cruces, Acala 1517 had significant higher yield compared to the other cultivars tested (Fig. 5a-b)
- The effect of planting date was not significant for most of the measurements. In Artesia, only the boll weight was significant, with the second planting date having heavier bolls that the first planting date. In Las Cruces, the lint turnout was higher for the second planting date than the third planting date.
- The fertilizer rate effect was not significant for all the measurements in Artesia and it was significant only for lint turnout in Las Cruses, with the 200 lb N/acre having higher lint turnout than 100 lb N/acre, but this had no significant effect on yields.

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