

**THE INFLUENCE OF VARIOUS DELINTING AND PRIMING TREATMENTS
ON COTTON SEEDLING EMERGENCE, DEVELOPMENT AND YIELD**

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Abstract

The successful establishment of a seedling stand is critical for the realization of maximum yields. One of the most important factors affecting plant establishment, aside from viable seed and adequate moisture, is soil temperature. It has been shown that low soil temperature at planting, approximately less than 20°C, can significantly reduce seedling establishment and plant development. Information from recent studies would suggest that protecting the seed from low temperature responses might provide an advantage for reducing the impact of stress and improve seedling establishment. It has also been shown that coating the seed using the EasiFlo™ cottonseed process, as well as 'priming' the seed, may provide the required protection. Also, the use of various delinting methods may offer additional protection in conjunction with the EasiFlo™ cottonseed coating. Therefore, the purpose of these studies was to determine the interactive role of seed coatings, 'priming' effects, and various delinting methods on cotton seedling establishment and yields.

A greenhouse and field study was conducted during the 2003 growing season. Treatments encompassing two delinting methods (acid and mechanical), primed (soaked in water for 12 hours and dried) and non-primed, coating (EasiFlo™ cottonseed system) and no coating, and combinations of each were established using Fibermax 966 as the cultivar for the studies. In the greenhouse experiment, seeds of each treatment were planted into plant growth pouches, which were placed in a constant temperature chamber and allowed to germinate and grow for seven days at 18°C. Following the seven-day period the germination percentage and root growth of the seedlings were evaluated. The field study consisted of establishing four row plots 100 ft. in length for each treatment, which were replicated four times. The plots were preplant irrigated using furrow irrigation after which one-half of the plots were irrigated according to an established irrigation scheduling protocol while the other half of the plots received no additional irrigation water. The plots were planted on April 23, 2003. Stand counts were measured in the center two rows of each plot on a weekly basis while soil temperature was measured using buried thermocouples on a daily basis. Rainfall and other weather information were collected from a nearby weather station. At the end of the season, the center two rows of each plot were harvested for yield.

The results of the growth chamber studies showed there was a significant increase in germination for the seed that was primed as well as for the seed that was coated. No difference in germination was indicated between the two delinting procedures (acid versus mechanical). There was also a significant increase in root growth for the primed and coated seed, but not for the delinting methods. The stand counts for the field study seven days after planting revealed similar results with the exception of no differences for the coated seed. When the stand establishment was evaluated at fourteen days after planting, there was a significant increase for the mechanical delinted seed and the non-primed seed, but no differences again for the coated seed. The increase in stand for the non-primed seed at fourteen days may have been because severe windstorms, along with some hail, occurred between the seven and fourteen day evaluation, thus possibly reducing the stand of the earliest emerged plants (primed). Yields were significantly higher for the irrigated plots, regardless of the seed treatments, while there was no significant difference in the seed treatments within an irrigation level. There was however, a slight advantage for the priming treatment for yield across both irrigation levels. Further studies are planned to evaluate the interaction of the seed treatments with different soil moisture levels and changes in soil temperature.