

## FACTORS ASSOCIATED WITH HIGH QUALITY PLANTING SEED

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Research is being conducted to determine some major factors associated with high quality planting seed. This work is supported in part by SuPima Association of America and the Arizona Cotton Planting Seed Distributors. During 1975, samples of the Pima seed lots handled by the Arizona Cotton Planting Seed Distributors were obtained. The samples included twelve lots of Pima S-4, four of Pima S-5, and three of P-28. These were planted in three replicated field studies; one at Phoenix and two studies were located at Marana. Planting dates, soil temperatures during emergence, and time required for emergence for the three tests are shown in Table 1.

Table 1. Observations from Three Plantings with Commercial Seed Lots

	Location		
	Phoenix	Marana	
Planting Date	March 28	April 14	April 21
Ave. Daily Max. Temp.	76	75	80
Ave. Daily Min. Temp.	54	60	62
Days for 50% Emergence	28	14	11

The soil temperatures at planting depth ranged from very low to relatively favorable in the three tests. This was reflected in the range of number of days for the plants to emerge.

The seed lots differed greatly in field performance. Averaged for the three tests, the best lot resulted in 42% more plants than the worst seed lot. Pima S-5 and P-28 seed lots performed considerably better as a group than the Pima S-4 seed lots.

The large variation in performance of the seed lots was unexpected since they were all produced in the Wenden-Salome area. All had a standard germination above 80%. A study of the history of the seed lots showed that field performance was closely related to gin date as shown in Fig. 1. Those seed lots that were not ginned until December or later generally performed poorly when planted the next spring.

In another study Pima S-4 seed were collected from regional variety tests at Phoenix, Salome, Marana, and Safford in 1973, and Phoenix, Marana, Safford, Salome, and El Paso, Texas in 1974. The seed were planted in the field during the spring following harvesting. The 1973 seed were planted in four replicated experiments and the 1974 seed were planted in three replicated experiments. Field performance was influenced by the area in which the parental plants were raised. Seed from high elevations generally performed poorer than seed from low elevations. The environmental factor most responsible for the low quality seed from high elevations appears to be excessively low night temperatures during August (Fig. 2). Flower tagging studies have shown that most Pima seed is set during August. Apparently if night temperatures are not warm, normal development of seed is impaired.

### RAPID PREDICTION OF SEED QUALITY

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This research was made possible by support from Supima Association of America and a grant from The American Seed Research Foundation.

Lack of a rapid test to evaluate cottonseed vigor before delinting and bagging prompted us to investigate whether seed quality could be assessed in a few minutes time. An attribute considered detrimental to the quality of any seed is the degree to which electrolytes and soluble compounds leach from seed. We have incorporated this principle into a rapid means by which seedsmen can gain an insight as to seed quality at any stage of production.