Short Communication

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Optimum Irrigation Scheduling for Cris-9, A New Cotton Variety of Sindh in Sakrand Conditions

Abdul Razaque Soomro

Central Cotton Research Institute, Sakrand, District Nawabshah, Pakistan

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The genetic yield potential of today's cotton plant is at least five and probably close to ten times the average yields we obtain each year. The primary cause of potential yield reduction is the unfavourable physical environment, including radiation, temperature and water supply. Water stress from excess water is a greater problem to stand establishment and seedling survival than is limited water supplies. However, the emphasis is nowadays on short season cotton production with the release of new higher yielding and early maturing varieties. Therefore there is need for more information about initial irrigation and frequency of irrigation.

Mustafa and Siddiqui (1978) reported that optimum interval between the 1st irrigation and the sowing was 42 days with two soaking doses and 28 days with one soaking dose. The optimum interval of subsequent irrigation was 15 days and yield of seedcotton decreased with increase in interval of subsequent irrigations.

Johnson *et al* (1990) indicated that the most common practice in the field was to "stress" cotton particularly prior to the first irrigation. With the release of more determinate verticillum wilt tolerant varieties, early observation indicated that this common practice did not appear to be meeting the water requirement of newer plant type.

Grimes (1991) opined that if the full genetic potential of fiber quality was to be realized, irrigation needed to be scheduled to avoid severe stress during boll maturation. This is especially true during the early part of the boll set period. A water deficit sufficient to lower fiber growth at this time will almost certainly affect productivity.

Godoy *et al* (1994) in their similar study indicated that the highest values in lint yield were obtained when irrigation was applied initially 60 or 70 days after planting and then after every 28 days. Fiber quality characteristics were not affected by any one of the treatments evaluated.

Asghar and Malik (1996) were of the view that first post planting irrigation might be applied at 50 to 60 percent depletion of available moisture. Further depletion of available water may restrict vegetative growth but when followed by ample supply of water, vegetative growth will be somewhat excessive, which may cause late flowering and reduced yield.

The present studies were therefore conducted to determine the effect of initial and subsequent irrigations on yield and fibre quality of CRIS-9, a new commercial variety of Sindh in Sakrand conditions for the information of its growers to take maximum benefit from its genetic potential.

The experiment was conducted during 1995 on the experimental field of Cotton Research Institute Sakrand. The experimental design was split plot with four replications. The main plot was initially irrigated at three levels (30 days after planting, 40 days after planting and 45 days after planting). The subsequent irrigation frequencies of the sub-plots were at two levels, 15 days and 21 days each after the initial irrigation. Variety sown was CRIS-9, a new commercial cotton variety of Sindh Province. The planting date was May 23, 1995. One bag per acre of DAP fertilizer was applied at the time of seed bed preparation and 2 bags per acre of urea were applied in split doses (one bag at the time of first irrigation and one bag at the time of peak flowering) during the season. In all, three insecticidal sprays were made; one for sucking pests (60 days after planting), second to control sucking as well as bollworms (at peak flowering and boll formation) and third to control the bollworm (at the time when 50 percent boll opening was observed).

Each plot had five rows, which were 10 meter long. Three inside rows of each five-row plot were picked (17th October 1995) for seedcotton yield per hectare calculations. Seedcotton was ginned on Institute's single plant ginning machines and lint samples were sent to Pakistan Institute of Cotton Research and Technology Karachi for staple length, fibre strength and micronaire tests.

Statistically significant differences in seedcotton yield were found among the varieties with different initial irrigation and subsequent irrigation frequencies (Table 1). The maximum seedcotton yield of 2004 kg ha^{-1} was obtained when CRIS-9 was irrigated 45 days after planting. As regards the subsequent irrigation frequencies the results obtained were also statistically significant and maximum yield was obtained when each irrigation was applied after 21 days. These results are in conformity with those of Godoy *et al* (1994) who reported that late applied first irrigation and subsequent irrigations realize maximum yield of seedcotton. The results of the application of first irrigation after sowing are also in accordance with that of Mustafa and Siddiqui (1978), who reported that maximum yield was produced when first irrigation was applied after 42 days of planting. However, the

Table 1

Effects of different irrigation treatments on yield and fiber quality of cotton variety CRIS-9.

Irrigation treatment	Seedcotton yield (kg ha^{-1})	Staple length (mm)	Fiber strength Thousand pounds per sq inch (Tppsi)	Micronaire
Initial				
30 DAP	1627 b	25.5 a	90 a	4.6 a
40 DAP	1788 b	25.4 a	91 a	4.6 a
45 DAP	2004 a	25.5 a	91 a	4.5 a
Frequency				
15 Days	1816 b	25.6 a	90 a	4.6 a
21 Days	2215 a	25.5 a	91 a	4.6 a

Means in columns followed by similar letter do not differ significantly according to DMR Test.

results of subsequent irrigations are different from the results of Mustafa and Siddiqui (1978).

The results of the effects of different irrigation treatments revealed that the initial irrigation and subsequent irrigation frequencies had no significant effect on fiber characteristics. All the three fiber characters remained unaffected and there were no statistically significant differences. These results are in accordance with those of Godoy *et al* (1994). However, the reported significant differences only in fiber strength and opined that these differences were not commercially important.

Key words: Irrigation schedule, Cotton, Fiber quality.

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