

## EFFECT OF ONE IRRIGATION THROUGH MONSOON HARVESTED WATER ON THE YIELD OF DURUM WHEAT

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In Bhal tract of Gujarat, irrigation is virtually unknown because there is no canal irrigation and the whole area has a saline unconfined aquifer. The annual precipitation of this tract is 705.6 mm of which more than 90 per cent is received during June to September. Cotton in *kharif* and durum wheat (*Triticum durum*) in *rabi* season are major crops in this region. Durum wheat is sown by the end of October or November and is grown on the conserved soil moisture. The whole of the wheat growing season often remains dry.

Availability of moisture in the seed zone is the primary requirement for proper germination and crop stand especially in dryland agriculture. The grain yield of dwarf wheat is reported to be maximum when the first irrigation is given at the crown root initiation stage (Sharma *et al.*, 1969). Grain yield decreased with early irrigation i.e., 14 days after sowing as well as with late irrigation given after the crown root initiation stage (Singh, 1973). Application of different volumes of water at sowing time in a dry year is reported to appreciably increase the yields (Sharma and Parashar, 1980). Singh (1981), however, reported that if water is limited, the deficits should be spread nearly evenly over the previous

growth stages and the critical stages of growth. In the present study an attempt has been made to find out the effect of single irrigation on the grain yield of durum wheat.

The experiment was conducted in the *rabi*, 1980-81 at the NARP, Arnej Farm, Bhal. The soil of the experimental field was silty clay loam, alkaline (pH 8.7), and had 0.0125 per cent total N, 2 kg Olsen's  $P_2O_5$ /ha and 0.5 m eq/100 g of exchangeable  $K_2O$ . Natural precipitation (20mm) was received only once i.e. at 52 days after sowing. The experiment was laid out in a split plot design with treatments replicated thrice. The four main plot treatments were: no irrigation ( $I_0$ ), single irrigation only once at crown root initiation (CRI) stage ( $I_1$ ), single irrigation at maximum tillering stage ( $I_2$ ) and single irrigation at flowering stage ( $I_3$ ). The five sub-plot treatments for varieties were:  $V_1$  (Arnej-206),  $V_2$  (Arnej-28),  $V_3$  (Arnej-1-8-8-42-1),  $V_4$  (G W-1) and  $V_5$  (Arnej-23-10). A uni-form dose of 30 kg N and 15 kg  $P_2O_5$ /ha was given to all the plots. The crop was shown on 30-10-1980 at 30cm row spacing with 60 kg/ha seed rate and harvested on 7-3-1981. Source of irrigation was run-off which was harvested during the

*kharij* season and stored in a pond dug for recycling water during the *rabi* season.

The best time to irrigate was (Table 1) the maximum tillering stage ( $I_2$ ). Irrigation at CRI stage also enhanced the grain yield significantly. The variety GW-1 ( $V_4$ ) was the highest yielder. The yield of other three varieties i.e. Arnej-28 ( $V_2$ ), Arnej-23-10 ( $V_5$ ) and Arnej-206 ( $V_1$ ) were statistically at par with GW-1 ( $V_4$ ). The finding that the tillering is the best stage for single irrigation is contrary to other reports (Sharma *et al.*, 1969 and Singh and Singh, 1973) but it is in

agreement with the findings of Singh (1981) who reported that the active tillering stage is more sensitive to soil moisture stress than the CRI stage. Singh (1981) further reported that, in case of limited water, the deficits should be evenly spread over critical stage and to that preceding it.

Interaction between variety and irrigation was significant, the best interaction being  $V_4 \times I_2$ , i.e. variety GW-1 with single irrigation at the maximum tillering stage resulting into the highest yield (1121 kg/ha) of durum wheat.

Table 1. Influence of irrigation and varieties on grain yield of durum wheat

Irrigation	Grain yield (kg/ha)	Varieties	Grain yield (kg/ha)
$I_0$	730	$V_1$	886
$I_1$	946	$V_2$	921
$I_2$	982	$V_3$	741
$I_3$	866	$V_4$	937
SEm	24.2	$V_5$	920
CD 5%	108.3	SEm	27.5
CV %	1.8	CD (5%)	82.5
		CV (%)	8.8

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