

## WHEAT PRODUCTION AS INFLUENCED BY PLANTING TIME UNDER RAINFED CONDITION OF ELMARJ-LIBYA

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### Abstract

Field experiments on seeding dates were conducted during 1990-91 and 1991-92 to determine the optimum time for sowing of wheat crop under rainfed condition. Early as well as late sowing of wheat reduced the yield. The optimum time of planting of Durum wheat variety Mexicale was found to be 4 to 21 December to obtain maximum grain production.

### Introduction

Wheat a major cereal food crop is well adapted for cultivation in irrigated as well as in rainfed areas of the world. The agroclimatic conditions of Libya, especially Elmarj is similar to South Australia where the mean precipitation is approximately 340 to 400 mm. Most of the rain falls during the months of December to January (Table 1). Under such conditions, it is very important to plant the varieties at optimum planting time for maximum returns and also avoid planting long duration varieties under short growing season. Different varieties of wheat have different optimum planting times. Therefore, if the maximum potential of a particular variety is to be exploited, it is imperative that the variety should be planted within its optimum period conducive to maximum yield.

Reduction of grain yield in wheat owing to delay in sowing has been widely reported (Ehardwaj *et al.*, 1971; Metha & Mathur, 1972; Sandhu *et al.*, 1975), while Rao *et al.*, (1984-86) reported the optimum time for *Triticum aestivum* L., to be 20 November to 20th December and sowing on 4 and 19 January affected the yield. The sharp rise in day temperature during the grain filling stage could be responsible for low yield due to late planting as it adversely affected the number of ears and grain yield. Similar results were reported by Asana & Williams (1965). The highest yield was 5239 Kg/ha, when the temperature was 20.6°C during the grain filling stage and lowest yield from the very late planted crop was 2892 kg/ha, when the temperature was 26.5°C (means during the grain filling stage). The emergence of plants was considerably delayed because of low temperature when sowing date was shifted beyond 20th November. A mean temperature of 16 to 20.5°C was most favourable for germination, confirming the results of Singh & Gill (1972) and Karnail & Narang (1976). There was reduction of 29 days in the duration from emergence to heading, and 20 days in the duration from heading to maturity when the date of sowing was delayed beyond 20 November and extended upto 19 January. The late sown crop was forced to flower and mature early when sowing was delayed. Amin *et al.*, (1989) have reported that increase in the length of growing period by early sowing is of greater economic importance for

Table 1. Mean monthly and long term average precipitation during rabi seasons.

Location Year	Monthly ppt. (mm)											
	September	October	November	December	January	February	March	April	May	June	July	August
Australian Farm/1990-91	7.0	61.3	6.6	115.3	47.0	104.6	18.9	15.8	---	---	---	376.5
Australian Farm/1991-92	---	22.5	116.0	80.5	51.75	57.0	45.5	11.0	---	---	---	381.5
Elmarj Av. (1956-72)	1.7	29.4	21.4	76.5	100.4	52.1	33.8	19.3	5.30	5.30	---	340.3

the maximum production of sugarbeet. Khan & Muhammad (1986) concluded that early seeding resulted in higher yields as compared with late seeding. The present study was therefore, undertaken to evaluate the optimum seeding time for maximum return/grain production under rainfed condition for wheat crop.

### Materials and Methods

A field experiment was conducted at Australian Demonstration farm at El-marj Libya, during the year 1990 to 1992. The field selected for this experiment was being operated under a wheat/medic rotation which did not show nitrogen response, so only 10 kg P/ha 20% P<sub>2</sub>O<sub>5</sub> was applied at seeding time in both the years. Durum wheat (Mexicale) was sown at different dates with a combine (Horwood Bagshaw) at seed rate of 85 kg/ha.

The following treatments were included in the study:

S.No.	Date of Planting	
1.	12-11-1990	12-11-1991
2.	04-12-1990	04-12-1991
3.	21-12-1990	21-12-1991
4.	07-01-1991	07-01-1992

The experiment was laid out in Randomized Complete Block Design, with 4 replications and a plot size of 3m x 50m. Rainfall received during both the years was also recorded (Table 1).

For weed control the field was sprayed with 5 l/ha of Dicuran F.W. 500 in 90 litre of water/ha by Nobili sprayer at 3-4 leaf stage of weeds. A 1.9 m width of each plot was machine harvested and grain yield and hectalitre weight were measured. The data was statistically analyzed by the methods given by Peterson (1939).

### Results and Discussion

Data presented in Table 2 shows significant results during both the years. By comparing the means with one another, it was found that planting of mexicale wheat on 21st December each year significantly increased the yield from the other treatments apart from 4th December. Grain hectalitre weight also increased at 21st December planting. Optimum time of planting Mexicale wheat seems to be between 4th and 21st December. Planting earlier on 17th November may have suffered from soil crust and late 7th January due to high temperature at grain filling stage. According to Singh & Sharma (1973), a delay in sowing wheat after December 22 showed a significant decrease in yield. Similarly, Green & Smith (1985) found that early sowing lead to an increase in wheat yield. Khan (1979) found that early sown crop between 7 November, 1979 to 20 November, 1979 produced a maximum yield but the yield declined significantly when the wheat crop was sown early in January, 1980. A delayed planting

**Table 2. Effect of planting time on wheat grain yield.**

S.No.	Time of planting	Grain yield (kg/ha)	Hectalitre wt(kg/ha)	Grain yield (kg/ha)	Hectalitre wt (kg/ha)
1.	7th November	890a	72.0	1770b	77.0
2.	4th December	1011ab	75.5	2060bc	77.0
3.	21st December	1153b	76.0	2130c	78.0
4.	8th January	979ab	73.0	1160a	77.0
L.S.D.	5% (Kg/ha)	158	--	320	
	1% (Kg/ha)	234	---	470	--

Means followed by similar letter (s) do not differ significantly from one another at 5% level of significance.

has also resulted in lowering the yield of wheat (Ciha, 1983). Early normal seeding increased tillering and grain yield in wheat as compared with late seeding (Musick & Dusek, 1980). The results of the present study suggest that the best time of planting of mexicale wheat variety for getting higher grain yield in El-marj is the month of December.

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