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MARA

THE EFFECT OF DIFFERENT SOWING TIME ON ESSENTIAL OIL OF CORIANDER IN GAP REGION

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ABSTRACT: *In 2 year trials with coriander (**Coriandrum sativum** L.) was conducted to find out the most suitable sowing time of coriander for essential oil production in GAP region. Five different sowing times (November 15, December 15, January 15, February 15, March 15) were used as treatments, seed yield and essential oil content were determined.*

According to the results, the highest seed yield was obtained from plants sown on November 15 at 66.77 kg/da, the highest essential oil content was obtained from plants sown on November 15 at 0.34 %.

Keywords: Coriandrum sativum *L., coriander, sowing time, essential oil.*

INTRODUCTION

Coriander (*Coriandrum sativum* L.), a member of the family *Umbelliferae* is an important spice crop. Its fresh leaves and fruits were used to give flavour to alcohol and non-alcohol beverages, cake and pie, milk product, sweet things, meat and meat products, chewing gums, aperitif, sauces, soups, vegetable foods, salad sauces and pickle (Doğan and Akgün, 1987). Also, coriander seeds have a number of medicinal uses as tonic, aperitif, analgesic, carminative, sedative, diuretic and aphrodisiac (Ceylan, 1987).

Its seeds and oils is one of the important commercial product (Doğan and Akgün, 1987). It was exported to European countries mainly to Germany, Italy, England, including U.S.A. and Arabic countries; totally 12 countries with 28 tons, accounting to $ 20.000. Meanwhile, 12 tons, accounting to $ 10.000 was important to meet the increased demand for coriander seed (Anonmyous, 1995).

Coriander is naturally grown in the Southeast Anatolia Project area, which occupies Adıyaman, Diyarbakır, Gaziantep, Mardin Siirt, Şanlıurfa, Batman and Şırnak provinces (Davis, 1975). Considering potentially of coriander as spice and essential oil plants of this region, the study was aimed to determine the most suitable sowing time for essential oil production in GAP region.

MATERIAL AND METHODS

The field trial was carried out at the Dicle University, Faculty of Agriculture, Diyarbakır, during the 1996-1997. The soil of the research area has heavy structure, 1.23 % organic matter having pH 7.96, deficient in phosphorus (0.41 %) and medium calcareous. The Southeast Anatolia predominate a steppe climate. Mediterrannean climate effect reduce from west to east. According to long weather reports, average rainfull is about 300 mm. In general, between June and September doesn't rain in the region. The average daily temperature is over 25 ^{o}C and the evoporation is very high. These weather conditions may be defined as detoriorated Mediterrannean climate (Tekinel et. al., 1992). The seeds used was local cv. which collected in GAP area (*Coriandrum sativum* var. *vulgare*). There were five sowing times with 30 days interval November 15, December 15, January 15, February 15, March 15. The trial was fertilized with 6 kg/da N and 3 kg/da P_2O_5 at the sowing time. The crop was attended as per routine cultural practises.

The data was laid out in a Randomized Complete Block design with three replication. The unit plot size was 4 x 1.2 m including 5 rows spacing 30 cm (Bhati, 1989). Coriander seeds were sown at a density of 2 kg/da. The central 1 m section of the two inner rows was harvested by cutting plants when fruits were fully matured (Vasyuta et al., 1984). The essential oil content of the dried seeds was asseyed by steam distillation (Halva et al., 1987).

RESULTS AND DISCUSSION

The effect of sowing time on some characters of coriander was presented in Table 1.

Plant height decreased with the delaying sowing in both year. The highest plant height was found in November 15 followed by December 15. This result is caused plant canopy which adversely affected the plant height. Baswana et. al. (1988) demostrated that plant height were greatly reduced if sowing was delayed.

The number of branch/plant reduced in delay sowing time in first year while minimum number of branch/plant was produced by the latest sowing March 15 (1.4 pieceses) the maximum number of branch/plant was obtained from earlier sowing on November 15 (5 pieces). In respect of second year, sowing time had not significantly affected the number of branches/plant while the earliest sowing time had 4.73 branches/plant and the latest sowing time had 1.47 branches/plant. Ahmed et. al. (1985) and Baswana et. al. (1989) produced same results in this respect.

Table 1. Effect of sowing time on plant growth characters, seed yield, essential oil content and seed yield of coriander.

	Plant height		Number of branch		1000 Seed weight	
Treatments	(cm)		(Pieces)		(g)	
Sowing Date	1995-96	1996-97	1995-96	1996-97	1995-96	1996-97
15 Nov.	51.60	71.6	5.0	4.73	11.3	9.59
15 Dec.	41.30	48.9	4.4	3.87	9.99	9.46
15 Jan.	43.3	42.1	3.1	2.60	10.3	8.28
15 Feb.	36.50	30.2	1.9	1.86	9.17	7.51
15 March	39.00	28.7	1.4	1.47	8.47	7.52
CD at 5%	9.245	15.6	1.47	NS*	1.68	1.12
	Seed yield		Esential oil content		Essential oil yield	
Treatments	(kg/da)		(%)		(l/da)	
Sowing date	1995-96	1996-97	1995-96	1996-97	1995-96	1996-97
15 Nov.	60.16	73.36	0.32	0.35	0.192	0.260
15 Dec.	51.53	71.63	0.34	0.32	0.176	0.255
15 Jan.	39.73	66.07	0.29	0.36	0.118	0.213
15 Feb.	24.13	58.87	0.31	0.25	0.075	0.146
15 March	13.13	26.63	0.34	0.21	0.042	0.057
CD at 5%	10.70	25.00	NS*	0.06	0.018	0.084

* NS: No Significiant

1000 Seed weight was significantly increased by sowing time in both year. The highest 1000 Seed weight was obtained sown on November 15, the lowest 1000 Seed weight was obtained sown on March 15 (Halva 1984). The 1000 Seed weight was found to be reduced when sowing was delayed. The results may caused by the shorter growth period. Our results is similar to findings of Halva et. al. (1984).

The Seed yield decreased as the sowing were delayed from November 15 to March 15 in both year. The highest seed yield was found in November 15 sown plants while the lowest seed yield was obtained from March 15 sown plants. The seed yield was found to be reduced considerably when sowing was delayed. The possible reason for low yield in delayed sowing might be insufficient time for vegetative growth as the plants entered the reproductive phase at a faster rate. These findings are in agreement with the results of Hornok (1976) who reported that earlier sowing produced higher seed yield..

In terms of essential oil content, no significiant differences were obtained from sowing times in the first year when the essential oil content ranged from 0.34 % to o.29 %. In the second year, sowing time influenced essential oil content. The highest essential oil was obtained from January 15 and the lowest essential oil content was obtained from March 15. Our results confirm an earlier study which was conducted by Khan et. al. (1982), Halva et. al. (1986) and Ceylan (1987).

Essential oil yield was influenced by sowing time in both years. The highest essential oil yield was obtained from November 15 sown plants whereas the lowest essential oil yield was obtained from March 15 sown plants. It was seen that under early sowing relatively higher seed yield produced more essential oil yield than lower seed yield. These results are confirmed by Kamla et. al. (1987) who stated that higher seed yield produced higher essential oil yield.

As a result, these data indicate that the most suitable sowing time is November 15 sown plants for essential oil production in Diyarbakır conditions representing GAP region.

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