

Standardization of Planting Time and Spacing in Onion (*Allium cepa L.*) under Sub-tropical Conditions of Himachal Pradesh

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Abstract

Suitable time of planting and spacing for onion cultivation under sub-tropical conditions of Himachal Pradesh was tested using Nasik Red as the test variety. Three different spacing and five different planting dates were tried. Maximum bulb yield was obtained during second fortnight of May when seedlings were transplanted on December 01 at a spacing of 15x10 cm. early planting was associated with more bolting, besides, reduction in yield and quality, whereas, late planting resulted in poor yield.

Key words: Onion, planting time, Himachal Pradesh

Introduction

Onion (*Allium cepa L.*) is the second most important vegetable crop after tomato and because of its specific flavour, pungency and culinary properties has become an indispensable item in every kitchen as condiment and vegetable. The green leaves, immature and mature bulbs are used as salads or cooked in many ways and also known to possess antibiotic properties. India has the largest area under onion cultivation in the world and ranks second in production after China. In Himachal Pradesh, onion is commonly grown during *rabi* season in the sub-tropical parts having ensured irrigation facilities. Early transplanting lead to bolting, besides, reduction in yield and quality, whereas, late transplanting gives poor yield. Keeping in view these facts, the present study was up to specify the planting time and spacing for onion cv. Nasik Red under sub-tropical conditions of Himachal Pradesh.

Materials and methods

The present investigations were conducted during three consecutive *rabi* seasons 2001-02 to 2003-04

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at the Experimental Farm of Regional Horticultural and Forestry Research Station, Bhota, Hamirpur (HP). The sandy loam soil of well prepared field was incorporated with recommended manures and fertilizers. The healthy seedlings of onion cultivar Nasik Red were transplanted on five dates at 15 days interval starting from November 01 to January 01 during *rabi* seasons of 2001-02 to 2003-04 at three spacings 15x10 cm, 15x15 cm and 15x20 cm in the beds of size 3.00 x 1.20 m. These 15 treatment combinations were laid out in randomized block design with three replications. The harvesting of the crop was done in May when bulbs attained sufficient size as well as maturity and there was 50% neck fall. The data on bulb yield and percent bolters was recorded on plot basis, whereas, that of bulb size and plant height was recorded on 20 randomly selected plants. Days to maturity were also counted from transplanting to harvesting. The data were subjected to analysis as per the procedures suggested by Panse and Sukhatme (1967).

Results and discussions

The onion cv. Nasik Red planted on December 01 at a spacing of 15x10 cm gave the maximum bulb yield of 202.40 q/ha (Table-1). Yield and growth was not much affected by early planting, which was associated with more bolting and reduction in bulb quality. However, drastic growth reduction was observed with late planting resulting in poor bulb yield. Almost similar trend was observed for bulb weight also. A continuous decrease in plant height was recorded with every step of delay in planting the crop. Days to maturity varied from a maximum of 200 days (early planting) to (late planting) and 140 days. The early planting was associated with the problem of bolting with bulbs having woody core. These results are in conformity with those of Singh and Korla (1991) and Singh et al. (1993) who also reported higher bulb yield with early transplanting.

Spacing played an important role with regard to bulb size and yield, however, plant height, maturity and bolting were least influenced. The bulb size was higher in plots having wider spacing. Such response must have been due to the availability of more space, providing more nutrients, air and sun light per plant which led to vigorous growth of the bulbs. But the bulb yield of plots with closer spacing i.e. 15x10 cm was always higher as more number of bulbs could be accommodated. It revealed that the higher bulb size under wider spacing did not compensate for the reduction in per hectare yield caused by decreased plant density at this wider spacing. Rashid and Rashid (1976) and Sirohi et al. (1992) also reported higher bulb yield with closer spacing.

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Table 1: Mean performance of Onion cv. Nasik Red as affected by planting time and spacing under sub-tropical conditions of H.P.

Traits	Yield (q/ha)				Plant height (cm)				Maturity (days)				Percent bolters (%)			
	2k1-2	2k2-3	2k3-4	Pooled	2k1-2	2k2-3	2k3-4	Pooled	2k1-2	2k2-3	2k3-4	Pooled	2k1-2	2k2-3	2k3-4	Pooled
Nov 01 & 15x10 cm	163.8	172.2	195.2	177.1	64.5	53.5	58.7	58.9	210	195	195	200	54.3	84.3	38.5	59.0
Nov 01 & 15x15 cm	173.6	158.1	179.4	170.4	65.6	52.0	60.5	59.4	210	195	195	200	62.9	82.5	42.4	62.6
Nov 01 & 15x20 cm	184.9	145.4	167.2	165.8	64.3	57.0	57.9	59.7	210	195	195	200	69.6	86.4	44.3	66.8
Nov 16 & 15x10 cm	164.1	171.6	182.5	172.7	63.4	56.0	54.7	58.0	195	180	180	185	55.1	79.4	29.4	54.6
Nov 16 & 15x15 cm	163.6	162.3	187.4	171.1	64.2	49.5	53.2	55.6	195	180	180	185	60.5	76.8	32.5	56.6
Nov 16 & 15x20 cm	184.7	145.2	150.4	160.1	65.2	57.5	52.1	58.3	195	180	180	185	68.6	75.9	34.6	59.7
Dec 01 & 15x10 cm	164.3	216.5	226.5	202.4	60.4	48.5	47.5	52.1	180	165	165	170	13.8	45.4	0.0	19.7
Dec 01 & 15x15 cm	204.6	192.1	194.3	197.0	62.4	54.5	51.2	56.0	180	165	165	170	22.4	41.5	0.0	21.3
Dec 01 & 15x20 cm	183.6	176.7	190.2	183.5	61.4	47.5	42.5	50.5	180	165	165	170	23.6	38.6	0.0	20.7
Dec 16 & 15x10 cm	122.6	141.4	134.0	132.7	55.6	45.0	35.7	33.7	165	150	150	155	0.0	25.4	0.0	8.5
Dec 16 & 15x15 cm	101.5	112.2	116.2	110.0	58.2	43.5	38.9	46.9	165	150	150	155	0.0	21.2	0.0	7.1
Dec 16 & 15x20 cm	101.0	106.1	102.4	103.2	57.2	42.0	39.2	46.1	165	150	150	155	0.0	28.4	0.0	9.5
Jan 01 & 15x10 cm	81.2	50.4	68.2	66.6	42.2	37.0	32.5	37.2	150	135	135	140	0.0	11.5	0.0	3.8
Jan 01 & 15x15 cm	61.2	47.7	57.0	53.3	45.1	39.0	33.7	39.3	150	135	135	140	0.0	9.4	0.0	3.1
Jan 01 & 15x20 cm	81.1	44.6	52.5	59.4	39.2	35.0	30.6	34.9	150	135	135	140	0.0	10.5	0.0	3.5
CD (5%)	26.5	21.4	27.6	25.2	6.3	5.9	7.8	6.7	27.5	23.0	24.5	25.0	24.1	25.0	18.7	22.6

