

EFFECT OF TRANSPLANT AGE AND DE-TOPPING ON SEED YIELD AND QUALITY OF RADISH (*Raphanus sativus* L.), VARIETY FOURTY DAYS

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ABSTRACT

An experiment was conducted at the Horticulture Farm of the Institute of Agriculture and Animal Science (IAAS), Rampur, Chitwan, Nepal during October 2001 to April 2002, to assess the effect of transplant age and de-topping on seed yield and quality of radish variety Fourty Days. The effect of de-topping treatment and age of transplant on seed yield was not significant. However, the treatment no-de topping gave higher average seed yield (5.15q/ha) than de-topping (4.77q/ha). Highest average seed yield (6.52q/ha) was given by a treatment combination of no-de topping and 50 days old transplant followed by a treatment combination of de-topping and 40 days old transplant (5.73q/ha) and lowest (3.83q/ha) was observed in a treatment combination of de-topping and direct seed sowing. A decreased seed germination percentage was observed in no-detopping treatments as the transplanting age increased whereas seed germination was increased in de-topping treatments as transplanting age increased. Highest 1000 seed weight (14.501g) was given by a treatment combination of no-de topping and 60 days old transplant. Similarly, positive effect of de-topping on 1000 seed weight (14.079g) was obtained through the treatment combination of de-topping and 50 days old transplant. The results indicated that roots transplanted 40 to 60 days after sowing gave higher yield and higher quality of seed in no-detopping treatments. Thus, adopting no-detopping along with root transplanting at the age of 40 to 60 days after sowing could be suitable practice for producing higher yield and better quality of seed of radish cv. Fourty Days in Chitwan condition. It is also practicable to adopt de-topping and whole root transplanting at the same age of transplants provided environmental conditions are favorable during reproductive phase of the crop. Additional research could be suggested in these aspects.

INTRODUCTION

Fourty Days (Chalis Dine) radish is extensively grown as a commercial crop for fresh consumption in mid-hills, low -hills and terai region of Nepal. It is not only grown for fresh production but its seed is also produced in the country in large quantity. The present quantum of seed production in the country is not sufficient to meet the increasing demand, although there are large production potential areas. As of now, the seed production is mainly confined only in the mid-hills of Nepal. There are other potential ecological regions in the country where seed could be produced and therefore, deserves exploring such potentialities in order to expand the production and supply.

Raising the present level of production and supply of quality seeds through appropriate improved technologies is one of the major challenges at present. The research activities on these aspects are meager. The present study was therefore, conducted to explore these possibilities. The objectives of the study were:

- To explore the possibilities of producing seed of radish cv. Fourty Days under hot and humid condition of inner Terai, Chitwan.
- To study the effects of direct seed sowing and various age of plant (transplant) at the time of transplanting on seed yield and quality of radish cv. Fourty Days in Chitwan condition.
- To study the effect of de-topping on seed yield and quality of radish in Chitwan condition.

MATERIALS AND METHODS

The present field experiment was carried out in the Horticulture Farm, Institute of Agriculture and Animal Science (IAAS), Rampur Campus, Chitwan, Nepal during October 2001 to April 2002. The soil of the experimental site is sandy loam and deep. The soil is fine textured and moderately permeable with very slow run-off and medium fertility and has a class of hypothermic Fluventic Haplustoll (Engel and Yeck, 1992). Soil is alluvial type deposited by Narayani and Rapti River (HMG, 1974).

The experiment was laid out in a factorial randomized complete block design (RCBD) with two levels of topping treatments (i.e., de-topping and no-de topping) and five different ages of transplants (i.e., direct seed sowing, transplanting at 30 days after sowing, 40 days after sowing, 50 days after sowing and 60 days after sowing). The seeds for all the treatment were sown in nursery bed for raising seedling transplant on 2 Oct 2001, which is normal time of seed sowing in Chitwan. The number of replication was three. Each individual plot which was 9m² in area (3.0 m x 3.0 m) consisted of 25 plants spaced at 60 cm row to row and 60 cm plant to plant (Anonymous, 1984). Out of these, the inner 9-plant (3.24m²) was used for taking observations and remaining 16 plants worked as border plants. Among nine observational plants five were tagged randomly and were used for taking observations of most of the parameters.

RESULT AND DISCUSSION

Statistical analysis of the effect of topping treatment and age of transplant on yield data, germination percentage and 1000 seed weight revealed no significant difference among the treatments. At the same time, the interaction between topping treatment and age of transplant was also not significant with respect to these characters.

As presented in table 1, highest average seed yield (6.52q/ha) was given by a treatment combination of no-detopping and 50 days old transplant followed by a combination of de-topping and 40 days old transplant (5.73q/ha) and a combination of no-detopping and direct seed sowing (5.52q/ha).

Highest seed yield through de-topping treatment was reported in a field study conducted on effect of de-topping on seed yield of 40 days radish in Western Nepal (Anonymous, 2002). The lowest average seed yield (3.83q/ha) was given by a treatment combination of de-topping and direct seed sowing.

Table 1: Effect of age of transplant and topping treatments on seed yield (quintals per hectare).

Topping treatments	Age of transplant					Mean
	Direct sowing	30 days after sowing	40 days after sowing	50 days after sowing	60 days after sowing	
De-topping	3.83	4.36	5.73	4.40	5.00	4.77
No-detopping	5.52	3.95	4.51	6.52	5.26	5.15
Mean	4.68	4.16	5.12	5.46	5.40	

Co-efficient of variation %: 22.8

Significance/Probability:

Age of transplant: LSD 1.370 at p (0.272)

Topping: p (0.367)

Interaction: p (0.082)

As far as seed quality is concerned, highest seed germination (95.3%) was given by a treatment combination of no-detopping and 30 days old transplant followed by a combination of no-detopping and 40 days old transplant (90.0%) and a combination of no-de topping and 60 days old transplant (89.5%). On the other hand de-topping on 50 and 60 days old transplant gave the (88.8 % and 89.2%) seed germination respectively. A decreased germination was found in no detopping as the transplanting age increased. But contrasting results were observed in case of de-topping treatment (Table 2).

Table 2: Effect of transplant age and topping on laboratory germination of radish seed in percentage.

Topping treatments	Age of transplant					Mean
	Direct sowing	30 days after sowing	40 days after sowing	50 days after sowing	60 days after sowing	
De-topping	87.6	84.6	83.7	88.8	89.2	86.8
No-detopping	88.0	95.3	90.0	86.2	89.5	89.8
Mean	87.8	90.0	86.9	87.5	89.3	

Co-efficient of variation %: 7.1

Significance/Probability:

Age of transplant: LSD 7.61 at p (0.903)

Topping: p (0.202)

Interaction: p (0.386)

Likewise, highest average 1000 seed weight (14.501g) was given by a combination of no-detopping and 60 days old transplant followed by a combination of no-detopping and 30 days old transplant (14.284g) and a combination of de-topping and 50 days old transplant (14.079g) as presented in table 3. Kanaujia (1994) also reported that transplanting dates have remarkable influence on seed yield per plant, quality and vigor of radish seed.

Table 3: Effect of transplant age and topping treatments on 1000 seed weight in grams

Topping treatments	Age of Transplant					Mean
	Direct sowing	30 days after sowing	40 days after sowing	50 days after sowing	60 days after sowing	
De-topping	13.972	14.033	13.372	14.079	13.884	13.868
No-detopping	14.033	14.284	13.616	13.636	14.501	14.014
Mean	14.003	14.159	13.494	13.858	14.193	

Co-efficient of variation %: 3.7

Significance/Probability:

Age of transplant: LSD 0.632 at p (0.179)

Topping: p (0.452)

Interaction: p (0.527)

Correlation studies between selected reproductive characters and seed yield indicated that none of the reproductive characters had positive correlation with the seed yield of radish except percent fruit set. The result indicated that there was an increasing trend in seed yield and seed quality in both de-topping and no-de topping treatments when the roots were transplanted 40 to 60 days after sowing. The reduced yield in this study is due to the adverse climatic conditions like hail storm, heavy rain during peak flowering and fruit setting stages (26 February, 2002). The extent of damage was more severe in de-topping treatments than in no-de topping treatments. Thus, no-detopping along with root transplanting at the age of 40 to 60 days after seed sowing could be suitable practice for producing higher yield and better quality seed of radish cv. Fourty days in Chitwan condition. It is also practicable to adopt de-topping and whole root transplanting at 40 to 60 day's age of transplant to achieve high yield and quality of radish seed provided environmental conditions are favorable during reproductive phase of the plant.

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