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RESEARCH PAPER

# Effect of planting dates on the performance of mungbean and urdbean varieties sown during spring season

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***Abstract*** **:** Field experiments were conducted during spring season of 2002 and 2003 at Govind Ballabh Pant University of Agriculture and Technology, Pantnagar to study the performance of mungbean and urdbean varieties under different dates of planting. Results revealed that March 12 planting of mungbean and urdbean produced significantly higher grain yield/ha and its attributes *viz*, grain yield/plant and number of pods/plant, whereas number of grains/pod and 1000-grain, weight were higher under February 20 planting. Number of pods/plant, grain yield/ plant and grain yield/ha were significantly higher in Pant M-2 variety of mungbean and Narendra U-.1 of Urdbean. The increase in mungbean yield under March 12 over February 20 and April 1 planting were to the tune of 19.9, 26,8 and 25.1 per cent during 2002 and 2003, respectively. However, the reduction in urdbean yield under February 20 and April 1 as compared to March 12 planting was to the tune of 21.4, 29.1 and 18.9, 29.9 per cent during 2002 and 2003, respectively.

***Key Words*** **:** Mungbean, Urdbean, Planting dates, Varieties

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## INTRODUCTION

Mungbean [*Vigna radiata* (L.) Wilczek] and urdbean [*Vigna mungo* (L.) Hepper] are the important crops of summer season. The maximum yield potential of the crops during summer season can be exploited under appropriate combinations of variety, environment and agronomic practices. The environment to which crop is exposed varies with change in planting dates. In early planting, crop growth is affected due to relatively low temperature towards the end of winter. On the other hand late planting time causes delay in maturity and onset of rainy season hampers the quantity and quality of the grains. A number of short -duration ellite varieties are, now a days, available which can be grown successfully during summer season. The present investigation was, therefore, carried out to study the effect of different planting dates and varieties on performance of mungbean and urdbean crop.

## MATERIALS AND METHODS

Field experiments were carried out during spring seasons of 2002 and 2003 at Crop Research Centre of G.B. Pant University of Agriculture and Technology, Pantnagar. The soil of the experimental site was silty clay loam with neutral soil reaction (pH 7.2) having high organic carbon (1.06%) and medium available phosphorus (17.8 kg P/ha) and potassium (196.5 kg/ha) contents. Two sets of experiments, one each on mungbean and urdbean, were laid out in split plot design with three replications. In both the crops, treatments comprised of three planting dates (February 20, March 12 and April 1) were allocated randomly in main plots' and varieties (Narendra M-1, Pant M-2 and Pant M-5 of mungbean and Narendra. U-1, Pant U-19 and Pant U-35 of urdbean) in sub plots. An uniform dose of 100 kg DAP (18% N and 46% $P_2 0_5$) was applied as basal in both the experiments. Crops were planted in lines, 25 cm apart, using a seed rate of 40 and 30 kg/ha for urd and mungbean, respectively. Other agronomic practices were

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adopted as per the recommendations for the crops.

## RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

**Effect of treatments on mungbean:**

March 12 planting recorded significantly more number of pods/plant as compared to February 20. However, the difference between March 12 and April 1 was not significant during both the years. February 20 planting which was at par with March 12 resulted in maximum number grains/pod and 1000-grain weight and was significantly superior to April 1 planting during both the years (Table 1). Among different varieties Pant M-2 produced significantly more number of pods/plant and grain yield/plant in comparison to Narendra M-1 and Pant M-5. However, number of grains/pod was significantly higher under Pant M-5 as compared to Narendra M-1 during both the seasons. Pant M-5 recorded significantly higher 1000- grain weight than that of remaining varieties during both the years. The increase in yield attributes under respective planting dates and varieties might be due to better translocation of photosynthates towards sink *i.e.* grain. Similar results were also reported by Singh *et al*. (2004).

March 12 planting out yielded February 20 and April 1 plantings during both the years. The increase in grain yield under March 12 over February 20 and April 1 planting were to the tune of 19.9, 26.8 and 16.4 and 25.1 per cent during 2002 and 2003, respectively.

Among different varieties Pant M-2 produced significantly higher grain yield as compared to remaining varieties. The lowest grain yield/ha was obtained from Narendra M-1 during both the years. These findings are in close conformity with Singh and Singh (1988). The increase in grain yield in Pant M-2 over Narendra M-1 and Pant M-2 was 30,9 and 20.5 per cent during 2002 and 33.7 and 21.9 per cent during 2003, respectively.

The highest grain yield under March 12 planting and in Pant M-2 variety were mainly due to increased number of pods/plant and grain yield/plant. These findings are in close conformity with those of Patil and Deshmukh (1988) and Singh (1996).

**Effect of treatments on urdbean:**

March 12 planting produced significantly more number of pods/plant as compared to February 20 but was at par with April 1 during both the season (Table 2). February 20 planting being at par with March 12 resulted in significantly more number of grains/pod and 1000-grain weight in comparison to April 1 planting during both the years. Grain yield/plant was significantly higher under March 12 as compared to remaining planting dates. Increased value of yield attributes under February 20 and March 12 plantings might be attributed to better growth and development of plant coupled with good source.-sink relationship as compared to April 1 planting. Results obtained by Saharia (1988) also corroborated the present findings.

Among different varieties Narendra U-1 recorded significantly more number of pods/plant and number of grains/ pod as compared to remaining varieties. Pant U-35 produced significantly bolder seeds during 2002 however, it was at par with Pant U-19 during 2003. Narendra U-1, Which was at par with Pant U-19 gave significantly higher grain yield/plant than that of Pant U-35 during both the years.

March 12 planting out yielded remaining planting dates during 2002 but was at par with February 20 during 2003. The reduction in urdbean yield under February 20 and April 1 as compared to March 12 planting was to the tune of 21.4, 29.1

**Table 1 : Grain yield and its attributes in mungbean as affected by planting dates and varieties**

| Treatments | Number of pods/plant | | Number of grains/pod | | 1000-grain wt. (g) | | Grain yield /plant (g) | | Grain yield (kg/ ha) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2002 | 2003 | 2002 | 2003 | 2002 | 2003 | 2002 | 2003 | 2002 | 2003 |
| **Planting date** | | | | | | | | | | |
| February 20 | 15.3 | 15.3 | 9.0 | 8.8 | 42.81 | 41.91 | 4.68 | 4.54 | 1163 | 1118 |
| March 12 | 17.3 | 16.5 | 8.9 | 8.7 | 38.64 | 38.59 | 5.80 | 5.61 | 1452 | 1337 |
| April 1 | 16.6 | 16.2 | 8.1 | 8.1 | 36.98 | 37.18 | 4.52 | 4.52 | 1063 | 1002 |
| S.E. ± | 0.3 | 0.2 | 0.2 | 0.1 | 1.09 | 0.86 | 0.09 | 0.15 | 45 | 45 |
| C.D. (P=0.05) | 1.3 | 0.9 | 0.7 | 0.5 | 4.25 | 3.35 | 0.37 | 0.59 | 174 | 174 |
| **Variety** | | | | | | | | | | |
| Narendra. M-1 | 14.5 | 14.2 | 7.3 | 72 | 32.74 | 32.70 | 4.41 | 4.32 | 1047 | 972 |
| Pant M-2 | 18.5 | 18.0 | 8.8 | 8.6 | 37.28 | 36.68 | 5.72 | 5.57 | 1370 | 1300 |
| Pant M-5 | 16.3 | 15.9 | 9.9 | 9.7 | 48.41 | 48.30 | 4.88 | 4.78 | 1262 | 1185 |
| S.E. ± | 0.4 | 0.3 | 0.4 | 0.1 | 1.09 | 0.51 | 0.14 | 0.15 | 30 | 30 |
| C.D. (P=0.05) | 1.3 | 0.8 | 1.2 | 0.4 | 4.75 | 1.57 | 0.44 | 0.48 | 93 | 93 |

**Table 2 : Grain yield and its attributes in urdbean as affected by planting dates and varieties**

| Treatments | Number of pods/plant | | Number of grains/pod | | 1000-grain wt. (g) | | Grain yield /plant (g) | | Grain yield (kg/ ha) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2002 | 2003 | 2002 | 2003 | 2002 | 2003 | 2002 | 2003 | 2002 | 2003 |
| **Planting date** | | | | | | | | | | |
| February 20 | 20.0 | 19.8 | 6.1 | 5.9 | 43.14 | 42.49 | 5.25 | 5.11 | 1142 | 1102 |
| March 12 | 21.9 | 21.2 | 5.8 | 5.6 | 39.98 | 39.99 | 6.34 | 6.25 | 1453 | 1360 |
| April 1 | 21.1 | 20.5 | 4.9 | 4.8 | 37.91 | 38.46 | 5.12 | 5.10 | 1030 | 980 |
| S.E. ± | 0.4 | 0.3 | 0.1 | 0.2 | 0.86 | 0.70 | 0.25 | 0.09 | 50 | 67 |
| C.D. (P=0.05) | 1.4 | 1.1 | 0.5 | 0.7 | 3.36 | 2.73 | 0.96 | 0.37 | 197 | 260 |
| **Variety** | | | | | | | | | | |
| Narendra. M-1 | 23.0 | 22.4 | 6.1 | 6.0 | 38.01 | 37.51 | 5.93 | 5.87 | 1307 | 1250 |
| Pant M-2 | 20.9 | 20.6 | 5.6 | 5.4 | 40.32 | 40.41 | 5.61 | 5.60 | 1210 | 1142 |
| Pant M-5 | 19.0 | 18.6 | 5.2 | 5.0 | 42.70 | 43.02 | 5.17 | 5.00 | 1108 | 1050 |
| S.E. ± | 0.3 | 0.3 | 0.1 | 0.1 | 0.43 | 01.22 | 0.13 | 0.21 | 22 | 36 |
| C.D. (P=0.05) | 0.8 | 1.0 | 0.2 | 0.4 | 1.32 | 3.74 | 0.40 | 0.65 | 69 | 109 |

and 18.9, 29.9 per cent during 2002 and 2003, respectively. The reduction in yield of urdbean under February 20 planting might be due to lower temperature at early stages of crop growth which directly affected plants vegetative and reproductive physiology. However, the lowest grain yield of urdbean under April 1 planting might be assigned to high temperature accompanied by high and hot winds and early monsoon rains during flowering, grain development and maturity stages. Saharia (1988), Saini and Jaiswal (1991) and Singh *et al.* (2004) also observed reduced yield of urdbean with delayed planting.

Narendra. U-1 produced significantly higher grain yield/ ha as compared to remaining varieties during 2002 however, it. was at par with Pant U-19 during 2003. The per cent increase in Narendra U-1 with respect to grain yield over Pant U-19 and Pant U-35 was 8.0, 17.9 and 9.5, 19.0 during 2002 and 2003, respectively. Higher grain yield under Narendra U-1 and Pant U-19 could be attributed to higher plant population at maturity, higher grain yield/plant and more number of pods/plant as compared to Pant U-35. Variation in yield under different varieties was also reported by Ram and Dixit (2000).

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