SUMMARY AND CONCLUSIONS
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A field experiment was conducted on clayey soil of the College Farm, N. M. College of Agriculture, Gujarat Agricultural University, Navsari Campus, Navsari to study the “Effect of soil conditioners with different levels of nitrogen on growth and yield of onion (Allium cepa L.) during rabi season of the year 1998-99.

Twelve treatment combinations comprising of four soil conditioners viz., FYM @ 10 t ha\(^{-1}\) (S\(_1\)), Castor cake @ 0.5 t ha\(^{-1}\) (S\(_2\)), Pressmud @ 5 t ha\(^{-1}\) (S\(_3\)) and Gypsum @ 5 t ha\(^{-1}\) (S\(_4\)) and three levels of nitrogen viz., 50 kg ha\(^{-1}\) (N\(_1\)), 75 kg ha\(^{-1}\) (N\(_2\)) and 100 kg ha\(^{-1}\) (N\(_3\)) were tested in factorial randomized block design with three replications. The soil of the experimental plot was clayey in texture, low in total nitrogen, medium in available phosphorus and fairly rich in available potash having well drainage with good moisture retention capacity.

The transplanting of onion variety Poona Red keeping 15 X 10 cm spacing was undertaken on 19\(^{th}\) January, 1999 and harvested on 12\(^{th}\) May, 1999. The crop was fertilized with 50 kg P\(_2\)O\(_5\) and 75 kg K\(_2\)O ha\(^{-1}\).

The weather was favourable for crop growth and there was no serious attack of pests and diseases during the course of investigation.

The various ancillary observations on growth were recorded periodically along with post harvest observations. Important findings emerged out from this investigation are summarized and concluded here.
6.1 Effect of soil conditioners

Initial and final plant population recorded during experimentation were found to be normal. Taller plants with higher number of leaves per plant were recorded at all the growth stages with an application of FYM @ 10 t ha⁻¹ (S₁) followed by an application of pressmud @ 5 t ha⁻¹ (S₃).

An important yield attributes like neck thickness, diameter of bulb and weight of bulb per plant were significantly higher with an application of castor cake @ 0.5 t ha⁻¹ i.e S₂ (1.25 cm, 6.18 cm and 70.22 g, respectively) as compared to other soil conditioners.

Dry matter content of the onion bulb were not influenced significantly due to application of none of the soil conditioners, however, castor cake @ 0.5 t ha⁻¹ found superior over FYM @ 10 t ha⁻¹, pressmud @ 5 t ha⁻¹ and gypsum @ 5 t ha⁻¹.

An application of castor cake @ 0.5 t ha⁻¹ (S₂) recorded the highest bulb yield (313.72 q ha⁻¹), however, it was at par with an application of pressmud @ 5 t ha⁻¹ (S₃) and FYM @ 10 t ha⁻¹ (S₁).

The nitrogen, phosphorus and potash uptake studies indicated that the maximum uptake of these nutrients were recorded with an application of castor cake @ 0.5 t ha⁻¹ (S₂).

The highest net profit (Rs. 47745.23 ha⁻¹) and cost:benefit ratio (1 : 4.18) were noticed with an application of castor cake @ 0.5 t ha⁻¹.

6.2 Effect of nitrogen

Growth characters viz., plant height and number of leaves
per plant were influenced significantly due to different levels of nitrogen. An application of 100 kg N ha⁻¹ (N₃) was found comparatively superior than rest of the nitrogen levels at most of the growth stages.

Yield attributes, namely, neck thickness, diameter of bulb and weight of bulb per plant were significantly higher with an application of nitrogen @ 100 kg ha⁻¹ (N₃) over 75 kg N ha⁻¹ (N₂) and 50 kg N ha⁻¹ (N₁).

Significantly the highest dry matter content of onion bulb was recorded with the highest level of nitrogen i.e. 100 kg N ha⁻¹ (N₃).

The highest bulb yield of onion (317.82 q ha⁻¹) was recorded with an application of 100 kg N ha⁻¹ (N₃) which was at par with nitrogen application @ 75 kg ha⁻¹ (N₂), but the former was significantly superior over 50 kg N ha⁻¹ (N₁).

Nutrient uptake studies indicated maximum nitrogen, phosphorus and potash uptake by onion bulb with an application of nitrogen @ 100 kg ha⁻¹.

Economics of different treatments showed that the maximum net profit (Rs. 47957.20 ha⁻¹) and cost:benefit ratio (1 : 4.07) were noticed with an application of nitrogen @ 100 kg ha⁻¹, while the lowest values were noted under 50 kg N ha⁻¹ (Rs. 39394.04 ha⁻¹ and 1 : 3.60, respectively). Among the treatment combinations, the highest net profit (Rs.52595.20 ha⁻¹) and CBR (1 : 4.07) were recorded in S₂N₃ combination (castor cake @ 0.5 t ha⁻¹ + 100 kg N ha⁻¹).
CONCLUSION

On the basis of experimental results it is concluded that an application of castor cake \( @ 0.5 \, \text{t ha}^{-1} \) alongwith 100 kg N ha\(^{-1}\) was the most effective treatment for \textit{rabi} onion bulb crop looking to the improvement in yield attributes, yield, net profit and N, P and K uptake by onion bulb.

FUTURE LINE OF WORK

1. An experiment should be conducted to determine efficiency of soil conditioners and its effect on physical properties of soil for various crops.
2. Long term experiment on various soil conditioners with different proportion should be conducted.
3. Fertilizer use efficiency with different levels of nitrogen and sulphur with different soil conditioners may be worked out to maximize the bulb yield of onion.