



Ratoon Management in Sugarcane Production: Improving Productivity and Profitability

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Sugarcane is a significant commercial crop and provides raw material in large material in large amounts to both the sugar and ethanol industries. A particular feature of it is that it can grow a second crop from the stubble that remains after harvesting. This second crop is known as a ratoon crop. Because the ratoon crop does not need the cane to be planted, it saves time, labour and the expense of seed material as well as that of preparing the land. Ratoon crops can give lower yields if they are not well managed, since uneven sprouting, gaps in the crop row, nutrient depletion, weeds, pests, diseases and soil compaction are all common problems. It is therefore essential to carry out proper management right after harvesting if a productive ratoon crop is to be obtained.

Importance of Ratoon Cropping

The cost of establishing crops is reduced by ratoon cultivation since it is not necessary to plant fresh setts. Moreover, it enables the following crop to be established more quickly and makes better use of the existing root system and the soil moisture. The productivity of ratoon crops is very much dependent upon the condition of the original plant crop and on the management that follows. It has been discovered that appropriate tillage and soil management techniques contribute to better growth and nutrient absorption in sugarcane plant-ratoon system (Kumar *et al.*, 2014). Ratooning should therefore be seen as a planned method of production and not merely allow the crop which has been harvested to regrow.

Proper Harvesting and Stubble Management

Ratoon farming starts by harvesting the crop grown in the field. It is important to harvest the sugarcane close to the ground so that healthy buds are left on the stumps. Fields that show poor growth or have a severe infestation of pests and diseases should usually not be chosen for ratooning. Stubble shaving is carried out after harvesting to cut the stubble close to the ground, which in turn promotes even sprouting. Meanwhile, off-barring- this includes loosening the soil around the rows of cane- improves aeration and results in favourable conditions for the development of new roots. The use of mechanical methods of managing the soil can make these operations quicker and more economical (Kumar & Thakur, 2014).

Maintaining a good crop stand

For a good ratoon yield it is necessary to have even sprouting and a sufficient plant population; any gaps in the field will decrease the number of productive canes and must therefore be filled when the plants are in their early growth stage. The variety chosen also plays an important role; generally speaking, those which have a good ratooning ability, vigorous stubbles and resistance to important pests and diseases are more suitable for maintaining productivity over successive ratoons.

Nutrient Management

Since new shoots start to develop shortly after harvesting, ratoon sugarcane needs sufficient nutrients. Nitrogen is especially important for early vegetative growth, and potassium helps with water regulation, cane strength and the general performance of the crop. It is better to use balanced fertilization rather than applying a single nutrient in excess. Soil management carried out in the right way can likewise increase the availability and uptake of nutrients. Kumar *et al.* (2014) found that nutrient uptake was better under appropriate mechanical soil-management practices. It is best to apply fertilizers close to the area where the roots are active, and using nutrient management based on soil tests can help to improve the efficiency with which fertilizers are used.



Figure 1: Emergence of young sugarcane ratoon shoots from the stubbles left after harvesting



Figure 2: Uniform ratoon establishment with retained sugarcane trash acting as a protective mulch

Trash Management

After sugarcane has been harvested, a lot of leaf waste is still left in the field. Rather than burning or removing residue, it can be left in place or mixed into the soil. The sugarcane trash can be used as mulch, which helps in retaining soil moisture, inhibits weed growth and contributes organic matter to the soil. The practice of incorporating the trash has been noted to enhance ratoon performance (Rai *et al.*, 2019). Likewise Surendran *et al.* (2016) discovered that combining appropriate tillage with trash management increased sugarcane productivity and improved soil properties. Hence, sugarcane trash should be regarded as a useful resource rather than as agricultural waste.



Figure 3: Early ratoon growth and crop establishment following post-harvest management

Irrigation and weed management

It is necessary to have adequate moisture during the early ratoon stage in order to ensure proper sprouting and tiller development. The irrigation schedule should be determined by the type of soil, the amount of rainfall and the needs of the crop. Drip irrigation is especially useful in cases where water is in short supply. Weeds compete with the young ratoon shoots for water, nutrients and sunlight, so it is important to carry out early inter cultivation and to manage the weeds in a timely manner in order to achieve good crop establishment.

Mechanization in Ratoon Management

Higher labour costs together with labour shortages are major drawbacks in the cultivation of sugarcane. The use of machinery can enable farmers to carry out ratoon operations quickly and in an economical way. Operations including stubble shaving, off-barring, soil loosening and the placement of fertilizer can be carried out by machinery. It has been demonstrated that appropriate tillage methods can improve ratoon productivity and at the same time reduce the need for manual labour (Kumar & Thakur, 2014). Mechanization is particularly useful in large areas where sugarcane is grown and in which several operations have to be carried out in a short time.

Major constraints

The main limitations when growing ratoon sugarcane are poor sprouting, an uneven crop establishment, nutrient depletion, competition from weeds, infestations by pests and diseases, and soil compaction, together with a possible decrease in yield as a result of the successive ratoons. The degree to which yield is reduced varies according to the variety, the environmental conditions, the method of harvesting and the way in which the crop is managed; the field should only be used for a ratoon crop when the current crop is in good health and has sufficient yield potential.



Figure 4: Tractor-operated ratoon management implement used for post-harvest field operations

Sustainable Ratoon Management

Sustainable ratoon management involves combining a number of practices rather than relying on just one technology. Proper harvesting, stubble shaving, balanced fertilization, efficient irrigation, timely weed control, trash retention and appropriate tillage should all be combined on the basis of local conditions. Trash management is especially useful since it not only aids in the recycling of residue but also enhances soil moisture and organic matter. In a similar way, mechanization can decrease the need of labour and lead to more timely field operations (Surendran *et al.*, 2016).

Conclusion

The practice of ratoon cultivation is a vital method for cutting down both the cost and the time needed to set up sugarcane. Yet it is not possible to achieve a good ratoon yield just by letting the previous crop grow on its own. For this to happen, proper harvesting must be carried out, the stubble must be managed well, balanced nutrition must be provided, irrigation must be ensured, weed control must be carried out, trash must be managed, and timely tillage must be performed. As labour costs rise there is more pressure on water and soil resources, effective ratoon management can help to improve both the profitability and sustainability of sugarcane production. The extent of the use of mechanization, the way in which residues are managed and the use of better ratooning varieties can further enhance the importance of ratoon crops in moderate sugarcane production.

References

1. Kumar, S., Saini, S. K., Bhatnagar, A., & Thakur, T. C. (2014). Effect of mechanical soil management through subsoiling and preparatory tillage on growth and nutrients uptake of sugarcane (*Saccharum complex hybrid*) plant and ratoon crop. *The Indian Journal of Agricultural Sciences*, 84(11), 1310–1315.
2. Rana, N. S., Singh, A. K., Kumar, S., & Kumar, S. (2003). Effect of trash mulching and nitrogen application on growth and yield of sugarcane ratoon. *Indian Journal of Agronomy*, 48(2), 124–126.

3. Shahi, H. N., Srivastava, T. K., Rai, R. K., & Suman, A. (2003). Soil behaviour and growth and productivity of sugarcane ratoon as influenced by trash management and preceding intercrops. *Indian Journal of Agronomy*, 48(4), 271–273.
4. Shukla, S. K., Jaiswal, V. P., Sharma, L., Tiwari, R., Pathak, A. D., Gaur, A., Awasthi, S. K., & Srivastava, A. (2022). Trash management and *Trichoderma harzianum* influencing photosynthesis, soil carbon sequestration, and growth and yield of sugarcane ratoon in subtropical India. *European Journal of Agronomy*, 141, 126631.
5. Surendran, U., Ramesh, V., Jayakumar, M., Marimuthu, S., & Sridevi, G. (2016). Improved sugarcane productivity with tillage and trash management practices in semi-arid tropical agro ecosystem in India. *Soil and Tillage Research*, 158, 10–21.
6. Shukla, S. K., Tiwari, A. K., Sharma, L., & Pathak, S. K. (2026). Ratoon management: Present status and future prospects for increasing sugarcane productivity in subtropical India. *Agrica*, 15(1), 73–90.