CHAPTER-V
SUMMARY AND CONCLUSIONS

5.1 Summary

Sugarcane is one of the important cash crops in India and all over the world. Today sugar industry and sugarcane growing farmers are facing lot of problems due to fall of sugar prices in our country and in world. This situation is arising due to increase in cost of production per hectare. World’s population is increasing day by day hence in future there is great demand for sugar. In order to meet the future demand of sugar, it is, therefore, essential to increase the sugarcane production & productivity by reducing its present cost of production per hectare, which is possible by Mechanization of sugarcane cultivation practices.

The mechanization in sugarcane cultivation should be done from seedbed preparation to harvesting and then in ratoon management. But in India, mechanization in sugarcane cultivation is restricted to tractorisation only i.e. up to seedbed preparation, all other works such as planting, interculturing, harvesting, ratooning work, are done by traditional methods, which will increase cost of operation.

Main objective of development of tractor operated stubble shaver cum fertilizer applicator is to meet the need to mechanize important farm operations like stubble shaving, off barring and fertilizer application and increasing use of tractor for ratoon sugarcane management operation.

The stubble shavings, off barring and fertilizer application are most important operations in ratoon sugarcane cultivation. Conventional method of stubble shaving, off-barring, and fertilizer broadcasting are labour intensive, beside it requires skilled labour for adequate shaving, off-barring, and proper application of fertilizer. In order to make sufficient use of available resources in sugarcane cultivation practices, use of tractor operated stubble shaver cum fertilizer applicator is very important to overcome the problems of non-availability of skilled labour for ratoon management work and high wages demanded by them for ratooning management operations. Therefore, study on performance evaluation of tractor operated stubble shaver cum fertilizer applicator was undertaken to assess its field performance.
Analysis of data obtained from field performance test of tractor operated stubble shaver cum fertilizer applicator draws following conclusions viz.

1. Field performance tests of implement was conducted in ratoon sugarcane (Variety CO 265) harvested field having soil type as medium black soil.
2. Implement can work easily in sugarcane field having row to row distance up to 120cm. The weight of the implement is about 340.00 Kg. It can be easily transported with three-point linkage of the tractor.
3. 35 – 40 hp tractor is best suitable for proper working of implement.
4. The working of the machine was smooth and without any additional load on the tractor.
5. Tractor with horse power less than 25.00 is not able to meet the power requirement of implement to perform stubble shaving, off-barring, fertilizer metering operation.
6. Cup feed mechanism used for fertilizer metering places correct amount of fertilizer at desired rate and distance.
7. Two tynes of implement performs off barring and trimming of old roots along the two shoulders of ridge up to average depth of 15.00 cm.
8. The wheels of tractor run smoothly between two adjacent rows of sugarcane crop without any damage to the standing crop.
9. Fertilizer metering mechanism places the fertilizer at the depth of 12.15 cm.
10. The draft requirement to operate the stubble shaver cum fertilizer applicator was measured 301.00 kg at 3 to 4 km/h forward speed of operation and power requirement was determined as 3.90 hp with fuel consumption 3.91 lit/h.
11. Stubble shaving efficiency observed highest at 3 to 4 km/h forward speed, 8 No. of blade per flange.
12. Damaged stubble was found lowest at 3 to 4 km/h forward speed and 8 No. of blade per flange.
13. The average effective field capacity of tractor operated stubble shaver cum fertilizer applicator was found to be 0.331 ha/h and with 79.73 field efficiency.
14. The amount of wheel slip is determined as 6.20 %. The average time taken in turning at the end of each bed was 20 second and the average time required in Refilling of fertilizer of the stubble shaver cum fertilizer applicator was 140 second.
15. The machine can shave the stubble from 1-hectare area in 3 hrs. while 287.10 man-hrs. required to shave the stubble manually.

16. Cost of operation was worked out to be ₹ 1574.37 against ₹ 8972.00 by traditional method. Thus, there is net saving of ₹ 7397.63 over conventional method.

17. Tractor operated stubble shaver cum fertilizer applicator was found suitable for performing different operations in sugarcane crop viz. stubble shaving, off-barring and fertilizer application simultaneously.