CHAPTER 5

SUMMARY AND CONCLUSION

Seed quality is a multiple concept comprising several physical, chemical and biological components. Seed being a biological or living entity, deterioration in its quality is inevitable and it occurs with advance in ageing, which is universal in all living organisms. The seed deterioration is the reduction in its quality attributes that begins immediately after attaining physiological maturity even on mother plant.

For a successful crop production, the use of good quality seed is very essential which increases the yield by 15-20 per cent. The extent of this increase is directly proportional to the quality of seed that is being sown. The seeds of a seed lot may differ by size, weight and density due to the production environment and cultivation practices. Seed size is one of the components of seed quality which affects the performance of crop. Size is the widely accepted measure of the quality. A wide array of different effects of seed size has been reported for seed recovery and thousand seed weight or test weight. However these results vary between hybrids.

Non availability of quality seed is one of the major constraints in increasing the productivity of agricultural crops. Seed grading is an integral part of seed production for enhanced planting value. Studies pertaining to seed grading based on seed size in relation to seed quality characters are warranted as amount of food reserve in seed is the basic requirement for its expression as germination and final establishment at field.

Seed size is an important parameter of seed vigour as it influences the performance of seed in soil. Seed bulk at harvest contains a wide range of seed sizes but these may not all be of equal value for sowing. Seed processing is one of the vital part of seed industry involved in making available high quality seeds of improved varieties to the farmers. A good seed processing job can ensure that the previous efforts of plant breeders in developing superior varieties and of seed producers.

The per cent study entitled "Seed size fraction distribution analysis of corn hybrids" in Nuthankal region of Rangareddy district was studied under the following specific objectives.
Summary and Conclusion

1) To carry out wet ear sorting fraction analysis of field corn
2) To understand the seed sizes of corn hybrids across their production location in a given season
3) To identify the best fit location for the given hybrid based on seed size analysis
4) To analyze the processing recoveries relative to seed sizes
5) To understand the relation of bulk density and seed size and their ultimate effect on processing recoveries

The studies of wet ear sorting of corn cobs of different hybrids were taken to determine the percent of half filled cobs, one fourth filled cobs, fungus affected cobs and male cobs in the overall discarded cobs.

The present study was envisaged with a view to upgrade the seed recovery and bulk density of corn hybrids like FC-1534, FC-1517, FC-1518, FC-1515, FC-1594 using different screen sizes include, 4.9mm, 5.1mm, 5.5mm, 5.9mm, 6.3mm, 6.9mm, 7.3mm, 7.5mm, 7.9mm, 8.1mm and 9.1mm. The study was conducted in the Nuthankal region of Rangareddy district covering the corn seed samples from the locations of Andhra Pradesh (Eluru, Rajahmundry, Guddapah, Venkatapuram and Nandyal)

5.1 FINDINGS OF THE STUDY

Sorting covered a batch quantity of 901 metric tonnes out of 8854 metric tonnes intake of the company, that is 10 per cent of the total intake. Out of the total discarded that is 0.45 per cent of cobs, the per cent of fungus affected cobs were found the highest, followed by other cobs which include immature, small sized, empty cobs etc. The per cent of one fourth filled cobs found was 0.03 per cent and the per cent of male cobs and half filled cobs was found very negligible, that is 0.01 per cent.

The hybrids that were studied for sorting analysis during the project period are FC-1514, FC-1517, FC-1519, FC-1534, FC-1552, FC-1554, FC-1559, FC-1574, FC-1594. The discards per cent of fungus affected cobs were found high, followed by one fourth filled cobs, half filled and male cobs. The sorting is done mainly to discard the male cobs, but the per cent of male cobs found was very negligible.
Among the corn hybrids studied, the discarded per cent was found the highest in the hybrids FC-1594 (0.9%) and FC-1519 (0.5%), whereas the least per cent of discarded cobs was found in the hybrids FC-1574 (0.2%), followed by the hybrids FC-1517 (0.3%) and FC-1514 (0.3%).

The discarded per cent of one fourth filled cobs was found the highest in FC-1574 (28.8%) and the least in FC-1557 (2.8%) and FC-1559 (2.8%).

The discarded per cent of half filled (9.1%) and fungus affected (3%) cobs was found the highest in the hybrid FC-1552.

The per cent of male cobs was found the highest in FC-1574 (19.2%) and the least was found in FC-1554.

As overall sorting discards per cent are only 0.45 per cent of the wet ear volume, so if we eliminate the sorting, it is not going to create any impact either on dryer efficiency (if we think of 1/2 filled or 1/4th filled cobs) or on quality of the seeds in final pack. The total sorting cost can be saved by INR 3,16,8,059 within a sorting period of 3 months in a year.

Efficient utilization of gravity table could be able to remove the light weight fungus seeds (expecting that, fungus seeds will turn to light weight after drying)

As male cobs per cent is less than 0.1 per cent, can be allowed for drying as it is not going to create any impact on overall quality.

Considering the above scenarios, if sorting can be eliminated in the hybrids like FC-1514, FC-1517, FC-1534 and FC-1574, the cost of sorting can be saved by INR 31,68,059.

The seed size analysis study includes the Syngenta corn hybrids, FC-1534, FC-1594, FC-1518, FC-1517 and FC-1515 which are acquired from different locations like Nandyal, Eluru, Rajahmundry, Badrachalam, Cuddapah and Venkatapuram. The seed sample 1000 grams of each hybrid were graded using different sieve sizes include, 4.9mm, 5.1mm, 5.5mm, 5.9mm, 6.3mm, 6.9mm, 7.3mm, 7.5mm, 7.9mm, 8.1mm, 9.1mm. The seeds that retained on the screen were collected separately and its quality parameters were evaluated. The observations studied in the analysis include, seed size (mm), seed recovery (%), bulk density (gm).
• The corn seeds retained on the 4.9mm, 5.1mm, 5.5mm, 5.9mm, 6.3mm screen sizes was in negligible amounts. The largest quantity corn seeds retained in the 8.1mm and 9.1mm screen size.

• The highest per cent recovery of corn hybrids FC-1515 and FC-1517 was found in Rajahmundry with the recovery of 98.7 per cent and 98.35 per cent respectively. Rajahmundry found to be the best fit location for the corn hybrids FC-1515 and FC-1517.

• The highest per cent recovery of the hybrid FC-1518 is observed in Nandyal with the recovery of 98.4 per cent. Hence Nandyal is considered as the best fit location for the hybrid FC-1518.

• The highest per cent recovery of corn hybrid FC-1534 was observed in Nandyal location with the recovery of 98.4 per cent and least recovery percent was observed in Cuddapah. Hence the Nandyal is the best fit location for the corn hybrid FC-1534.

• The hybrid FC-1594 is produced across Eluru region and the highest recovery obtained across the region is 98 per cent. Hence the production of the hybrid FC-1594 should be continued at Eluru as it is giving a good per cent recovery of more than 95 percent.

• The highest bulk density of hybrids is found in the corn seeds retained on the 8.1mm screen and 9.1mm screen. The highest bulk density was observed in the hybrids FC-1518 (390g) and FC-1515 (390g) in 8.1mm screen whereas in FC-1594(390g) in 9.1mm screen.

• The good bulk density indicates the less loss of rejections of low weight seeds in the gravity table. Lesser the rejections, higher the per cent of recovery. Hence the per cent recovery was found to be highest in the 8.1 and 9.1 screens, as the highest bulk density was observed in those screens. The lowest recovery was observed in the screens include 4.9mm, 5.1mm, 5.5mm, 5.9mm, 6.3mm, 6.9mm, as the seeds retained are negligible.

5.2 CONCLUSION

The study has identified that the overall percentage of rejections were found very negligible during sorting of corn hybrids. The per cent of other cobs(immature cobs, small seeded cobs and unfilled cobs) were observed the
highest, followed by fungus affected cobs, half filled and male cobs. The least discarded corn cobs per cent was observed in the hybrids FC-1514, FC-1517, FC-1534 and FC-1574. Hence if the sorting is eliminated in these hybrids than the amount can be saved by INR 31,68,059.

The corn seeds retained on the 4.9mm, 5.1mm, 5.5mm, 5.9mm, 6.3mm screen sizes were in negligible amounts. The largest quantity corn seeds retained in the 8.1mm and 9.1mm screen size. The highest per cent recovery of corn hybrids FC-1515 and FC-1517 was found in Rajahmundry, FC-1518 and FC-1534 was observed in Nandyal, FC-1594 was observed in Eluru region. The highest bulk density of hybrids is found in the corn seeds retained on the 8.1mm screen and 9.1mm screen.

5.3 SUGGESTIONS

• Efficient utilization of gravity table would remove the light weight fungus seeds (expecting that, fungus seeds will turn to light weight after drying).

• As male cobs per cent is less than 0.1 per cent, can be allowed for drying as it is not going to create any impact on overall quality.

• The sorting should be eliminated in the hybrids FC-1514, FC-1517, FC-1534 and FC-1574 and the sorting should be performed for problematic hybrids like FC-1554 and FC-1559 in which the highest per cent of discarded cobs was observed.

• The production of FC-1515 hybrid should be continued in the locations of Cuddapah, Eluru and Rajahmundry, the production of FC-1517 should be continued in Venkatapuram, Cuddapah and Rajahmundry regions, the production of FC-1518 should be continued in Nandyal and Eluru regions and the production of FC-1534 should be continued in Nandyal, Eluru and Badrachalam and declined in Cuddapah region, the production of FC-1594 should be continued in Eluru region.