

## A Comparative Study on the Growth and the Development of Andrews and of a Cambodia Strain

by

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**Introduction:** Andrews is a variety of Sea Island cotton introduced into South India from the West Indies. It belongs to *G. barbadense* and possessed extra long staple of over 1½". The Agricultural Departments of Mysore, Kerala Andhra and Madras States have been endeavouring to popularise its cultivation, but with very little success. Its erratic and generally poor yield has been the main cause for the *ryots* not taking up this variety to the desired extent. With a view to gain an insight into the probable reason for its poor performance, a study on the growth and the development was undertaken in comparison with a Cambodia strain at Coimbatore during 1966. The results have been reported in this communication.

**Material and Methods:** The variety Andrews along with 63-1, a Cambodia variety typically representing the *hirsutum* strains under commercial cultivation in the Southern States was raised at the Cotton Breeding Station, Coimbatore in summer 1966, in three-row plots randomised and replicated four times. The rows were spaced 75 cm apart and the plants 15 cm along the rows. The plots were given 50 kg N/ha in the form of ammonium sulphate over a basal dressing of phosphoric acid and potash at 15 kg each /ha. The crops were adequately protected against pests and diseases.

Each plot was divided cross-wise into five equal parts from each of which a normal plant was selected at random from the middle row. In the selected plants 1) height of stem, 2) leaf count (at weekly intervals), 3) daily flower count, 4) total number of fully matured bolls, 5) weight of seed cotton per plant, 6) weight of seed cotton per boll, 7) jinning out-turn and 8) lint length were recorded.

**Results:** a) *Development of main stem:* The data on weekly growth increments and the length of main stem were recorded from the sixth week of sowing and have also been represented graphically in figures 1 and 2.

From the graph, it may be seen that the initial rate of growth in Andrews was greater than in 63-1. However, from the 8th week after sowing, the rate of growth began to retard in Andrews and this retardation was more drastic

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FIG.1. RATE OF GROWTH

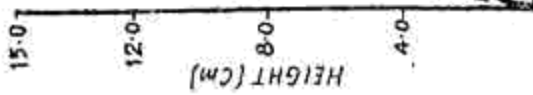


FIG.3. RATE OF LEAF PRODUCTION

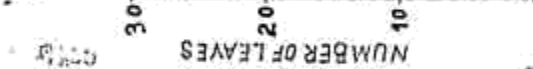


FIG.5. RATE OF FLOWER PRODUCTION

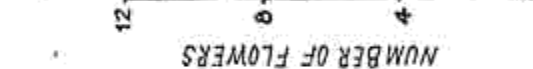


FIG.2. CUMULATIVE PLANT HEIGHT

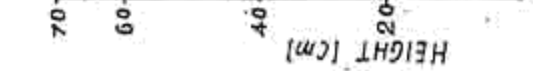


FIG.4. CUMULATIVE LEAF PRODUCTION

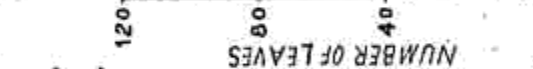
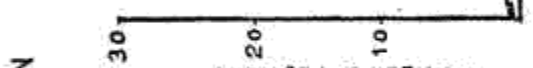


FIG.6. CUMULATIVE FLOWER PRODUCTION



— 63-1  
- - - ANDREWS

and uniform as compared to that in 63-1. From the shape of the curve, it looks as though 63-1 is able to withstand the retarding forces better than Andrews. The final plant-height of 63-1 was 69.6 cm and that of Andrews 63.4 cm.

b) *Production of leaves*: The rate of production of leaves per week and the cumulative totals are depicted graphically in figures 3 and 4.

When the leaf count was started in the 6th week after sowing, Andrews was found to have produced on an average 22 leaves per plant and 63-1, 24. Thus there was not much difference between the two varieties. This continued to be so in the 7th week also. Apparently the rates of production of leaves per week up to and inclusive of 7th week were similar. But starting from 8th week, the rate of production per week was much less in Andrews than in 63-1, so that the disparity between the total quantity of leaves produced by Andrews and that of 63-1, was very wide by the 14th week after sowing, when the flower production ceased completely. The total production was only 62 per plant in the case of Andrews as compared to 101 of 63-1.

c) *Flower Production*: Data on the rate of flower production per plant per week as also the cumulative totals for different weeks are graphically represented in figures 5 and 6.

It will be obvious that the flower production commenced at the same time in the eighth week after sowing in both the varieties with more or less similar rates of production. However, 63-1 continued to maintain its rate of production constant till thirteenth week and thereafter only decline was rapid. In contrast, rapid retardation began even from eleventh week in Andrews. Flower production ceased by fourteenth week in Andrews and by fifteenth week in 63-1. Andrews produced 27 flowers as compared to 32 for 63-1.

d) *Other observations*: Data on the number of fully matured bolls and seed cotton yield per plant as well as on boll weight, ginning percentage and fibre length are summarised in Table 1.

TABLE 1. *Economic Characters*

| Variety | Total number of matured bolls per plant | Seed cotton yield per plant (g) | Weight of seed cotton per boll (g) | Ginning percentage | Mean fibre length (mm) |
|---------|---|---------------------------------|------------------------------------|--------------------|------------------------|
| Andrews | 13.0                                    | 24.7                            | 1.7                                | 32                 | 34.3                   |
| 63-1    | 11.6                                    | 50.0                            | 4.2                                | 36                 | 30.7                   |

Excepting in the number of bolls and fibre length, Andrews was inferior to 63-1 in all other respects. In particular, the size of the bolls in Andrews

was strikingly smaller than in 63-1. This smallness of the bolls is the immediate cause for the low yield.

**Discussion :** In the initial stages of its life cycle, Andrews is as good as the Cambodia type in growth and development. But from about the eighth week after sowing its activities begin to decline at a much faster rate than those of Cambodia and in consequence it becomes inferior to Cambodia in plant stature as well as in the production of leaves and flowers. Eventhough it gives as many bolls as Cambodia, the size is smaller. The ginning capacity also is lower. The cumulative result of all these is that the *kapas* and lint yields of Andrews become much lower than those of Cambodia. The findings of Dastur (1949) in Sind is that *barbadense* is inferior to *hirsutum* in assimilatory capacity. This appears to be the case with Andrews grown in Southern India also. It is therefore, too much to expect Andrews to give as much yield as a local Cambodia strain in the Southern States, when grown under identical farming conditions.

Higher price has been fixed by the Government for Andrews. Apart from the fact that the price differential itself is considered to be not very attractive, growers who cultivate this cotton at the promptings of the State Agricultural Departments receive very often only more or less the same price as is paid to quality Cambodia in the local markets. The failure of the trade to pass on the price differentials which reflect its spinning value, vexes the cultivators and acts as a damper to the spread of its cultivation.

**Summary :** A study on the growth and the development of Andrews cotton was undertaken in comparison with a Cambodia type to gain an insight into the probable cause for the poor productivity of Andrews. The results show that in the initial stages of its life cycle, Andrews proves to be equal to Cambodia in growth and in the production of leaves and flowers. But from about the time when flowering begins, growth as well as leaf and flower production becomes slower than in Cambodia. It, therefore, appears reasonable to infer that Cambodia is able to continue to meet its metabolic requirements better than Andrews. It is probable that the assimilatory capacity of Andrews is less than that of Cambodia under the conditions of the trial. On account of this fact the yield of Andrews cannot but be less than that of Cambodia. Hence, so long as the trade is not prepared to pay the growers a sufficiently higher price for its better quality so as to compensate for its lower yield there can be no prospect for the wide spread cultivation of Andrews.

#### REFERENCES

- Dastur, R. H. 1949. Growth studies on Sea Island (Barbadense) cottons under Punjab and Sind conditions to determine the causes of their low yields. *Ind. Cott. Gr. Rev.*, 3 : 121-34.
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