

Mixed Cropping and the Cotton Root Rot Disease

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THE growing of cotton mixed with another crop has been practised for long in India and other tropical countries. In the Punjab, a leguminous or other crop is often sown with cotton for use as fodder. Recently the investigation of benefits of mixed cropping has been taken up in some stations; it is in progress at Rothamsted. But the effect of mixed cropping on the incidence of diseases has not been fully studied. Some experiments have been conducted on this subject at Lyallpur in relation to the root rot disease of cotton.

The experiments were conducted in a field which was heavily and uniformly infected with the disease. Mollisoni 39—an indigenous cotton—was sown in May, at the optimum time for the appearance of the disease, with a view to provide conditions favourable for a vigorous attack of the disease. Sorghum J. 20 was broadcasted on the same day in between the rows of cotton. A border of 2 feet was also sown with sorghum all round the cotton crop. Another set of plots was sown with pure cotton to serve as controls. The plots were arranged in randomised blocks replicated four times. Weekly counts of mortality due to root-rot were made both in the mixed and pure cotton plots. Records of air temperature, soil temperature (at 30 cm. depth) and humidity were taken twice a day, i.e., at 8 a.m. and 5 p.m. The sorghum crop was removed on the 16th of August.

The figures for the average per cent. mortality from week to week in the mixed and pure cotton plots are given in the table.

Total mortality throughout the season was 3.4 per cent. in the mixed plots as against 68.5 observed in the pure cotton control plots.

The results recorded in the above table show that mortality in the mixed crop is significantly lower than in pure cotton throughout ($t = 5.36$). Soil and air temperatures were lower in the mixed crop while humidity was higher.¹

Root-rot mortality in mixed and pure cotton plots

Week ending	Per cent. mortality	
	Cotton only	Cotton + Sorghum
20-6-39 ..	7.67	0.83
26-6-39 ..	12.47	0.34
3-7-39 ..	10.84	0.16
10-7-39 ..	4.84	0.08
17-7-39 ..	10.47	0.00
24-7-39 ..	12.10	0.00
31-7-39 :	5.72	0.00
7-8-39 ..	12.47	0.00
14-8-39 ..	3.21	0.00
21-8-39 ..	2.12	0.00
30-8-39 ..	1.78	0.00
4-9-39 ..	1.20	0.00
11-9-39 ..	2.23	0.09

In another experiment, Desi cotton (variety Mollisoni 39) was sown on 14th of May, and Moth (*Phaseolus aconitifolius*) was sown between the cotton rows on the same day. A border of the same crop was also sown around cotton. Three plots were sown with mixed crop and the same number was put under pure cotton as checks. Along with root-rot mortality counts, soil and air temperatures were also recorded. The temperatures were lower in the mixed crop than in the pure and humidity was higher in the former. The mortality in cotton with moth was lower than in pure cotton, the difference being highly significant. It was further found that in the plots where moth was mixed with cotton, the root-rot mortality occurred during the first fortnight only and that too on spots where moth crop was thin. It will be seen that raising cotton either with sorghum or moth will reduce the incidence of root-rot disease. Moth is, however, more

suitable than sorghum, as it neither shades nor affects the growth of cotton plants.

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¹ Vasudeva, R. S., *et al.*, *Ind. J. Agric. Sci.*, 1939, 9, 595.

A Note on the Occurrence of Tri-Cotyledonary Seedlings in *Crotolaria juncia* Linn.

DURING the course of an investigation now in progress, seedlings of *Crotolaria juncia* were raised in the garden attached to the Bose Research Institute. Seeds were supplied by the Fibre Expert to the Government of Bengal, Dacca. Number of cotyledonary leaves in the

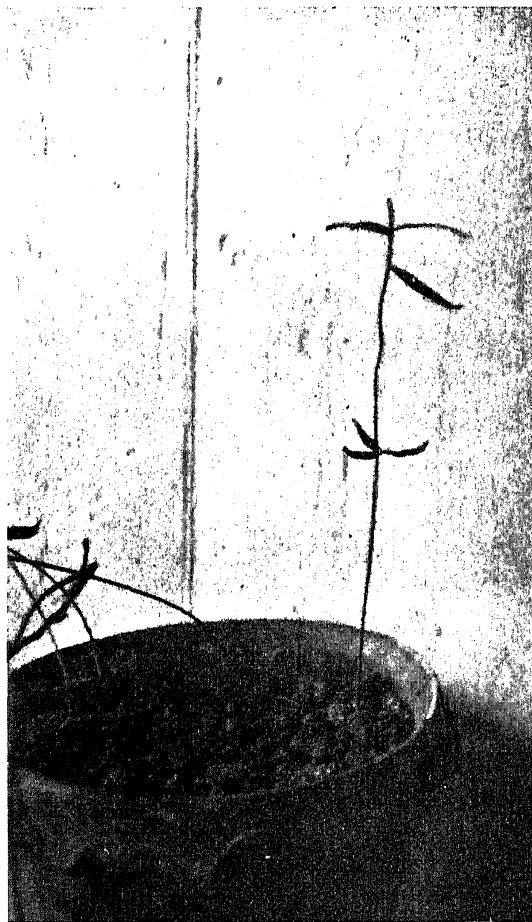


FIG. 1

Photograph of a seedling of *Crotolaria juncia* showing three cotyledons. $\times 1/3$.

seedlings were ordinarily two but few showed abnormal number of three cotyledons. It was found that multiplication of cotyledons in *C. juncia* were of frequent occurrence in the sample of seeds used during investigation. Seedlings which were subsequently raised at the Falta sub-station of the Institute also showed abnormality in the number of cotyledons. Out of 760 seedlings eight seedlings had three cotyledonary leaves. None of the cotyledonary leaves showed any sign of external distortion or splitting and were arranged symmetrically in a whorl.

Multiplication of cotyledonary leaves have been noted in few angiosperms: *Acer pseudo-platanus*, *Cheiranthus cheiri*.¹ Abnormal number of cotyledons (3-5) have been noted in *Correa*, *Crataegus*.² Tri-cotyledonary seedlings have been noted in *Apium pteroselium* and few species of *solanum*.² In *Crotolaria juncia* faciation of inflorescence axis and of stem have only been noted.³ Progenies of the tri-cotyledonary seedlings will be studied in the next generation and a detailed account will be published later.

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¹ Worsdell, *Principles of Plant Teratology*, 1915, 2, 215.

² Masters, *Vegetable Plant Teratology* (*Lond. Roy. Soc.*): 1868, 370.

³ T. C. N. Singh, *Journ. Ind. Bot. Soc.*, 1930, 9, 250.

On the Origin and Distribution of Cloud Charges

OF the two important theories advanced to explain the production of electrical charges in thunder clouds, *viz.*, the "breaking drop" theory of Simpson and the "ion capture" theory of Wilson it has not yet been decided which is the process really in operation. It is generally considered that perhaps both are in operation. Simpson's theory¹ predicts negatively polarised clouds and Wilson's theory² predicts positively polarised clouds. In practice both are