

PLANTING MEDIA FOR SUGARCANE FUZZ AND SEEDLINGS

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The experiments with modified John Innes' composts which are described in this paper were carried out on sugarcane fuzz and seedlings at the Mauritius Sugar Industry Research Institute following promising results obtained by the first writer with vegetables, flowering plants and tobacco at the Barkly Experiment Station of the Department of Agriculture.

(A) COMPOSTS

Both the original John Innes' seed and potting composts have been modified to suit local conditions as follows:—

<i>Original John Innes' Seed Compost</i>	<i>Modified Seed Compost</i>
(Parts by volume)	
2 turfy loam	2 top soil
1 granular peat	1 granular material obtained by sieving decaying wood through $\frac{3}{8}$ " sieve
1 sand	1 coral sand
2 lb. superphosphate	2 lb. superphosphate per cubic yard
1 lb. chalk	
(Parts by volume)	
<i>Original John Innes' Potting Compost</i>	<i>Modified Potting Compost</i>
7 loam	7 top soil
3 granular peat	3 granular material (as in seed compost)
2 sand	2 coral sand
5 lb. J.I. base	3 lb. J.I. base (less hoof and horn)
1 lb. chalk	

The top soil for both the seed and potting composts was steam sterilized at 93°C for 5 minutes at low pressure.

The ordinary mixture used as control consisted of:—

Top soil ...	...	...	2 parts
Farm-yard manure	...	...	1 part

The mixture used for planting fuzz was steam sterilized at 93°C at low pressure for about four hours. That used for potting seedlings was not sterilized. Some phosphatic guano was added to the mixture as usual.

Equal parts by weight of fuzz were sown in:—

1. Common seedling flats 19 $\frac{3}{4}$ " × 13 $\frac{1}{2}$ " × 4 $\frac{2}{3}$ " containing soil-manure mixture.
2. Common seedling flats containing modified J.I. seed compost.
3. Common seedling flats containing modified J.I. P₂ potting compost.

4. Standard British seed boxes 14" × 8 $\frac{1}{2}$ " × 2" containing modified J.I. seed compost.

5. Standard British seed boxes containing modified J.I. P₂ potting compost.

The object of the experiment was to compare:—

1 and 3 1 and 5 3 and 5

1 and 2 and 4, the seedlings in 2 and 4 being pricked.

Fuzz from 14 different crosses has been used in the experiments, but that from five crosses only gave good germinations, the number of seedlings obtained being as follows:—

Cross No.	Experiment No.				
	1	2	3	4	5
1745	88	72	95	100	46
1747	591	560	600	840	752
1751	44	50	50	20	40
1752	162	168	120	120	124
1753	413	456	497	390	384
TOTAL	1,298	1,306	1,362	1,470	1,346

There was, in all probability, no difference in the times taken for the fuzz to germinate, in the number of seedlings obtained and in the rate of seedling growth between the experimental and control flats.

A few cases of damping-off were noticed in the plots containing soil-manure mixture, but none in those containing the modified John Innes' composts. The disease did not make much headway in the affected flats, except in one case, where it was acute.

Pricking

Experiments were made to determine the best stage of growth for pricking seedlings, and conclusively showed that this operation should be performed as soon as the seedling can be handled, that is, about five days after germination. There is then apparently no set-back.

Seedlings from experiments 2 and 4 were pricked in standard British cases containing modified John Innes' potting compost at the rate of sixty seedlings per case. A loss of 5 per cent. only was recorded. The seedlings which had been pricked were the best.

Transplanting to Pots

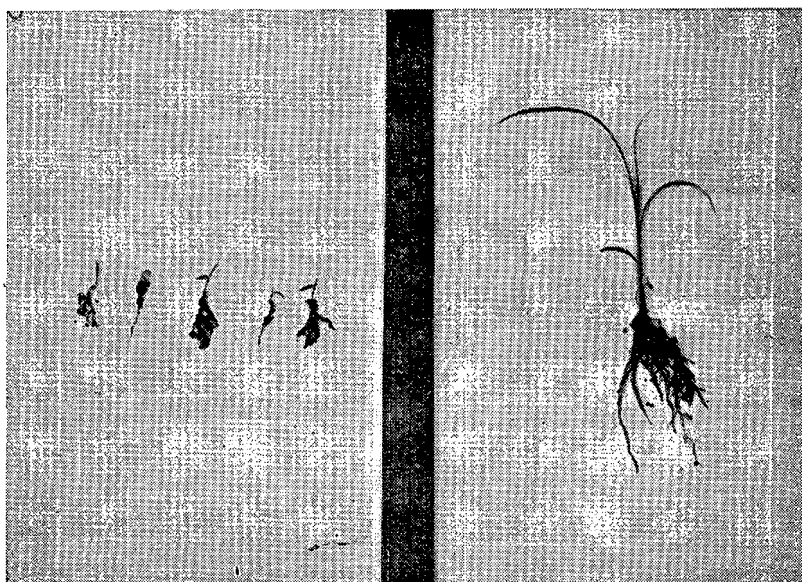
One hundred seedlings from pricking boxes were transplanted to ordinary straw pots containing modified John Innes' potting compost, and one hundred seedlings from the same boxes were transplanted to control straw pots containing unsterilized soil-manure mixture.

The seedlings transplanted to pots containing compost seemed to perform better than those in the control pots up to about two weeks after transplanting, the best seedlings in the soil-manure mixture not being sturdier than those in the compost. There was, thereafter, distinct nitrogen deficiency symptoms in the experimental pots as a result of hoof and horn not having been added to

Crushed basalt had, therefore, no effect on fuzz germination. A depressing effect on growth of seedlings was noticed in 50 per cent. of the seedling flats, there being not a single case of positive response to the basalt. In view of these poor results, no pot experiments have been made, and crushed basalt cannot be recommended as a soil conditioner in seedling flats.

CONCLUSIONS

The modified John Innes' seed compost has not proved better as a planting medium for fuzz than the ordinary soil-manure mixture, except in so far as the compost is less conducive to damping-off disease incidence. The volume of compost in the



Seedlings at pricking stage

Seedling ready for planting in straw pot

the potting compost. The addition of a few grammes of sulphate of ammonia soon corrected the deficiency, the seedlings resuming normal growth five to six days after application of the nitrogen fertilizer.

(B) BASALT

Basalt dust was added to the ordinary soil-manure mixture at the rate of one part by volume of basalt to two parts of mixture, with a view to improving the physical structure of the ordinary planting medium used for sowing the seed-bearing fuzz. Flats containing the soil-manure mixture alone were used as control. Fuzz from thirteen crosses was used for the experiment. The mean number of seedlings obtained was:—

Soil-manure-basalt	...	...	277
Soil-manure (Control)	...	...	246
Significant difference (20:1)	...	...	±61

standard British seed-boxes being about a quarter that in the common seedling flats used by the Sugar Research Institute, the total amount of compost to sterilize is accordingly much less, a factor of economic importance when large quantities of fuzz have to be dealt with.

Pricking is definitely advantageous, particularly when competition for growth in dense seedling populations results in thin seedlings more likely to die off after potting. This operation is naturally labour-consuming, but the benefits derived therefrom will largely offset extra costs. It was found that a trained labourer can prick 60 seedlings in 12 minutes, or about 2,500 per day.

Regarding the ingredients in the modified John Innes' formulae, coral sand and top soil can easily be obtained. Large deposits of partially decomposed stems and roots of the traveller's tree (*Ravenala*

madagascariensis) are readily available. About forty-eight cubic feet of this decayed material will be required for raising 60,000 seedlings. Leaf-mould prepared with appropriate activators could be used as a substitute if need be.

It is intended to import hoof and horn, which is a source of slow-acting nitrogen. The absence of this nitrogenous fertilizer from the potting compost resulted in a nitrogen deficiency which was rapidly corrected by the application of a little sulphate of ammonia.

Lack of response to crushed basalt is surprising in view of the good results of field experiments conducted by the Chemistry Division of the Research Institute. Yield increases of the order of five to six tons of cane per acre have been obtained, under super-humid conditions, following single applications of 182 tons of basalt dust at planting. The depressed growth in the flats to which crushed basalt had been incorporated may be due to lack of adequate nutrients, particularly nitrogen, the volume of soil-manure being reduced, due to addition of basalt. It must be remarked, however, that the addition of nitrogen to the seedling flats would have produced soft growth, and is, therefore, not desirable.

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and
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Dr. McMartin, the Chairman, said that many people would remember Mr. Julien and Dr. de Sornay, who had attended the Congress some years ago from Mauritius. As these gentlemen were not present today, he called upon Dr. Brett to read the paper on their behalf.

At the conclusion of the reading **Dr. McMartin** said although the method of raising seedlings was of interest to people who were raising cane seedlings, it applied to people who were interested in raising seedlings of any description. He related that many years ago it was necessary to study a large number of formulae for potting composts. The John Innes' Institute, therefore, made a study of all the varying

formulae and had now reduced them to one or two. Slight modifications to the John Innes' recipe has been used at the Experiment Station. Using these scientifically composited, sterilised composts made a big difference to seedling raising at the Experiment Station. It was therefore interesting to see that Mauritius had worked along the same lines and while the authors showed no appreciable difference between the John Innes' formula and the ordinary old-fashioned soil manure mixtures as far as germination was concerned, the incidence of disease was remarkable in the case of the old soil manure mixture.

Mr. du Toit said that in high rainfall areas it was claimed that a great response was obtained by the use of crushed basalt. It was used in enormous quantities and he asked Mr. Park how this enormous quantity was handled.

Mr. Park said that the amount which was used was over 100 tons per acre and this did not prove to be a practical proposition.

Dr. Brett, in connection with a question asked by Mr. Rault, said that they had recently resorted to merely trimming the seedlings, to prevent undue competition between them when the flats were crowded.

Mr. Lintner asked the relative importance of soil mixtures as against sterilisation as far as damping off of seedlings was concerned.

Dr. Brett said that sterilising the soil greatly reduced, though it did not completely eliminate, the possibility of infection.

Mr. Twinch said that damping off could be prevented by the use of various fungicides.

Dr. Brett said that they had tried out various fungicides, but had not found any that were completely satisfactory.

The Chairman said that as far as damping off was concerned steam sterilisation had still proved to be the best.

Mr. Coignet asked if it was necessary when large numbers of seedlings were planted out to sterilise the whole tin of soil or just the top two inches.

Dr. Brett said it was advisable to sterilise all of the soil used in the flats.