

Controls.	Government fertilizer 100 lbs. p.a.	Compost 10 tons p.a.	Karoo Manures.							
			First type.			Second type.				
			10 tons p.a. mixed with soil.	5 tons p.a. mixed with soil.	5 tons p.a. placed below set.	1,000 lbs. p.a. mixed with soil.	10 tons p.a. mixed with soil.	5 tons p.a. mixed with soil.	5 tons p.a. placed below set.	
ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	
Average, 3 replications	11.6	8.6	14.8	19.7	15.6	17.5	11.3	24.2	21.4	19.2

Government Fertilizer.—The 3 : 13 : 3 mixture gave a decided depressing effect in this series.

Karoo Manures and Compost.—All the heavy dressings of Karroo manures gave comparatively good yields compared with the controls. A dressing of 1,000 lbs. per acre gave no results, which confirms the general opinion that organic manures require heavy dressings for effective results.

The compost results in this experiment are not so good as in Experiment A. Considering the high moisture contents of compost the results are fairly comparable with that obtained from Karroo manure. The low cost of the former makes compost the more economical product.

Heavy rains were experienced during these tests, so that any possible burning effect of alkaline salts in the Karroo manures, even with the heavy dressings used, was rendered nugatory.

EXPERIMENT C.

The chief object of this experiment was to determine whether the method of applying the 3 : 13 : 3 mixture has any effect on the subsequent growth. With this object in view, the Government mixture was applied in the following ways:—

1. Mixed with the soil 9 inches below the sets.
2. Mixed with all the soil in the pots.
3. Placed without any admixture with soil immediately below the sets.
4. Placed on top of the soil after planting and lightly raked with the top soil.

Streak-free Uba cane was used as the indicator plant and a good sandy loam was the soil type used. This experiment was

Controls.	Super, 1,000 lbs. p.a.		Compost, 10 tons p.a.		Compost, 10 tons p.a. + 1,000 lbs. Super, mixed	Compost, 10 tons p.a. + 1 ton Lime mixed	Karoo Manure, 10 tons p.a. mixed.	Filter Cake, 10 tons p.a.		
	Not mixed with soil.	Mixed with all soil.	Not mixed with soil.	Mixed with all soil.				6 months mixed.	12 months mixed.	
ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	
Average, 3 replications	12.5	14.0	13.8	19.7	22.2	19.1	21.1	19.9	15.5	15.5

* Mixed means that the manure has been mixed with the soil below the set.

The Results.—The superphosphate series gave a slight increased yield. Six-months-old and year-old filter cake gave the same increase, and compost and Karroo manure again showed their superiority.

GENERAL CONCLUSIONS.

From a practical standpoint pot tests, using sugarcane as the indicator plant, are simple and quick compared to field tests.

To what extent the results can be compared with field work is unknown. Owing, however, to the standardization of all the factors in pot tests, except the point under observation, many interesting effects can be studied. After several years observation of this method, I consider it worthy of further investigation.

Outstanding results from these experiments are:—

1. Organic Manures.—Compost and Karroo manures give outstanding results under the conditions of the tests. Thus compost showed a total average increase over the controls of 45 per cent. and Karroo manure 69 per cent. The larger yields from Karroo manure are chiefly due to its more concentrated form. Small applications of such materials, as shown in the 1000 lbs. per acre series, are not worth the cost. Heavy applications, as indicated above, give the best returns. The standard application in Mauritius is 17½ tons of compost per acre for plant cane.

planted at the end of August, 1943, and reaped at the end of February, 1944. The results were as follows:—

Controls.	Government Fertilizer 3 : 13 : 3, 1,000 lbs. per acre.			
	Mixed with soil below sets.	Mixed with all the soil in pots.	Placed below the sets without mixing.	
ozs.	ozs.	ozs.	ozs.	
Average, 3 replications...	12.5	12.7	12.2	13.7

Series B.—In this series selected sets of cane from streak-free Uba seed bed were used instead of sprouted eyes. The sets were single stalks 9 inches high when replanted into the pots.

Controls.	Mixed with soil below sets.	Placed on top of the soil after planting.		
		1,000 lbs. p.a.	2,000 lbs. p.a.	
ozs.	ozs.	ozs.	ozs.	
Average, 3 replications...	15.2	14.8	14.2	*14.0

* One test only.

The Results.—From these 6 control pots and 16 fertilized pots no significant results were obtained from any of the different methods of fertilizer application.

EXPERIMENT C.

This experiment was a continuation of the previous series, in which various other fertilizer and compost applications were used.

2. Government Fertilizer and Superphosphate.—The general results for 21 tests, using the Government mixture 3 : 13 : 3, show a depressing effect of 2.8 per cent. No significant differences were observed when this fertilizer was applied by—

- (a) Mixing with the soil under the set.
- (b) Mixing with all the soil.
- (c) Placing without mixing directly below the set.
- (d) Applying on the surface of the soil.

Superphosphate, either placed directly below the sets or mixed with all the soil, gave an increased trend over the controls.

Compost applications alone appeared sufficient, as combinations with Government fertilizer, superphosphate and lime gave no apparent benefits.

3. Filter Cake.—Undecomposed filter cake (four months old) containing bagasse particles from the Oliver Campbell filters, gave a depressing effect on growth in five different types of growth. A root analysis confirmed and explained the reason for this effect.

Later tests with rotted filter cake, six and twelve months old, gave identical increases in each case.

APPENDIX. Detailed Results of Pot-Testing Experiments.

EXPERIMENT A.

	Control.	Filter cake 15 yons p.a.	Compost 15 tons p.a.	Govt. fertilizer 1,000 lbs. p.a.	Compost 15 tons, Govt. fert. 1,000 lbs. p.a.		Control.	Filter cake 15 yons p.a.	Compost 15 tons p.a.	Govt. fertilizer 1,000 lbs. p.a.	Compost 15 tons, Govt. fert. 1,000 lbs. p.a.
Series 1	4.50	2.88	9.50	4.38	5.75	Series 4	12.00	11.50	13.25	13.28	19.50
	3.62	2.88	8.50	4.50	9.25		10.50	10.38	17.62	9.62	16.25
	4.50	2.12	8.25	4.00	6.88		10.75	9.75	13.38	11.50	13.25
Average	<u>4.21</u>	<u>2.63</u>	<u>8.75</u>	<u>4.29</u>	<u>7.29</u>	Average	<u>11.08</u>	<u>10.54</u>	<u>14.75</u>	<u>11.17</u>	<u>16.33</u>
Series 2	7.88	8.88	10.62	7.00	13.75						
	9.75	8.25	14.50	8.50	10.25						
	9.50	6.00	11.75	6.75	11.62						
Average	<u>9.04</u>	<u>7.71</u>	<u>12.29</u>	<u>7.42</u>	<u>11.88</u>	Series 5	9.50	8.50	20.38	7.75	11.88
Series 3	5.88	6.88	10.62	6.75	8.75		9.50	8.50	17.75	8.12	14.00
	7.25	5.75	11.25	9.25	11.50		8.25	7.75	14.00	6.88	11.62
	5.75	5.50	12.62	7.25	14.12	Average	<u>9.08</u>	<u>8.25</u>	<u>17.38</u>	<u>7.58</u>	<u>12.50</u>
Average	<u>6.29</u>	<u>6.04</u>	<u>11.50</u>	<u>7.75</u>	<u>11.46</u>	Total average :	<u>7.94</u>	<u>7.03</u>	<u>14.93</u>	<u>7.64</u>	<u>11.89</u>

EXPERIMENT B.

Control.	Government Fertilizer. 1,000 lbs. p.a.	Compost. 10 tons p.a.	Karoo Manures.						
			First type.			Second type.			
			10 tons p.a. mixed with soil.	5 tons p.a. mixed with soil.	5 tons p.a. direct below set.	10 tons p.a. mixed with soil.	5 tons p.a. mixed with soil.	5 tons p.a. direct below set.	
10.75	7.75	15.50	19.50	14.25	15.50	25.25	20.50	18.50	
12.50	9.00	14.25	20.75	16.00	18.25	23.75	21.00	21.50	
11.50	9.00	14.75	18.75	16.50	18.75	23.75	22.75	17.50	
Average	<u>11.6</u>	<u>8.6</u>	<u>14.8</u>	<u>19.7</u>	<u>15.6</u>	<u>17.5</u>	<u>24.2</u>	<u>21.4</u>	<u>19.2</u>

EXPERIMENT C.

Government fertilizer 3 : 13 : 3, 1,000 lbs. per acre.				Government fertilizer 3 : 13 : 3.					
Controls.	Mixed with soil below sets.	Mixed with all soil in pot.	Placed below set. No mixing.	Controls.	Mixed with soil below sets.	Placed on top of the soil and lightly covered.			
						1,000 lbs. p.a.	2,000 lbs. p.a.		
Series A	13.00	12.00	13.00	13.75	Series B	16.00	14.50	15.00	14.00
	12.00	13.50	11.75	14.50		14.50	13.00	14.50	one test
	12.50	12.75	11.75	12.75		15.00	17.00	13.00	only
Average	<u>12.5</u>	<u>12.7</u>	<u>12.2</u>	<u>13.7</u>	Average	<u>15.2</u>	<u>14.8</u>	<u>14.2</u>	<u>14.0</u>

EXPERIMENT D.—(Continuation of Experiment C, Series A.)

Controls.	Superphosphate.		Compost.				Karoo Manure.	Filter Cake.		
	1	2	1	2	3	4		1	2	
13.00	14.00	14.25	20.50	24.50	17.75	24.50	20.00	16.25	15.50	
12.00	13.75	13.50	19.75	20.50	20.00	21.00	20.50	15.75	15.50	
12.50	14.25	13.75	20.00	21.50	19.75	17.75	19.25	14.50	15.50	
Average	<u>12.5</u>	<u>14.0</u>	<u>13.8</u>	<u>19.7</u>	<u>22.2</u>	<u>19.1</u>	<u>21.1</u>	<u>19.9</u>	<u>15.5</u>	<u>15.5</u>

Note.—All weights in ounces.