Research Notes :

A Note on the Behaviour of White Clay as Filler in the Mixed Fertiliser

In the manufacture of mixed fertilisers, the fillers play an important role by serving as a corrective of the residual acidity and as conditioning agents. Kanwar *et al.* (1963) observed that there was no significant effect for any of the fillers like gypsum, press-mud and lime stone on the availability of phosphoric acid in the NPK mixture. Gopalaswamy and Varadarajan (1967) found that the urea-super mixture could not be stored without bringing about reversion of phosphoric acid. But the reversion could be minimised by changing the fillers or by adding urea in small quantities to the mixture.

In order to find out the feasibility of introducing the different particle-sizes of white clay as filler, in the standard mixture 16 : 4 : 4 a storage trial was conducted with the following eight treatments.

1. Urea + Super + Potash + 1mm size white clay as filler
2. ,, ,, ,, 0. 5mm ,, ,,
3. ,, ,, ,, 0.25mm ,, ,,
4. ,, ,, ,, Gypsum as filler
5. Urea + Ammonium sulphate + Super + Potash + 1mm size white clay as filler
6. ,, ,, ,, ,, ,, 0. 5mm ,, ,,
7. ,, ,, ,, ,, ,, 0.25mm ,, ,,
8. ,, ,, ,, ,, ,, Gypsum as filler

The white clay received from Neyveli analysing 0.57% moisture, 0.01% N, 0.17% phosphoric acid and 0.44% potash was airdried and sieved with different size-meshes, namely, 1mm, 0.5mm and 0.25mm to obtain the different grades of fillers. In the first four treatments, the filler used in the manure was to the extent of 34.4% while in the rest the filler used was only 6.2%. The fertiliser mixture prepared with different sizes of fillers were stored in polythene-lined jute bags at the rate of one kg per bag and the samples were analysed for their total N, phosphoric acid, potash, water-soluble phosphoric acid, citrate soluble and citrate insoluble phosphoric acid and moisture contents at monthly intervals for a period of seven months. The results are furnished in Table 1.

During storage there was not much of variation in the total N, phosphoric acid and potash contents of the manure mixture; but there was reversion of water-soluble phosphoric acid to citrate soluble phosphoric acid in varying degrees depending on the fineness of white clay used in the mixture.

TABLE. *Results of analysis of manure mixture 16 : 4 : 4*

Treatment No.	N		P_2O_5		K_2O		WSP		CSP		Av. P_2O_5 (CSP WSP)		Moisture	
	*I	F*	I	F	I	F	I	F	I	F	I	F	I	F
1.	16.11	16.11	4.72	4.72	4.10	4.10	4.15	3.14	0.30	1.16	4.45	4.30	2.62	4.01
2.	16.10	16.10	4.68	4.67	4.17	4.15	4.17	2.82	0.28	1.48	4.45	4.30	2.77	4.23
3.	16.09	16.10	4.65	4.65	4.13	4.12	4.13	2.74	0.17	1.56	4.30	4.30	2.77	4.10
4.	16.09	16.09	4.70	4.71	4.10	4.09	4.10	1.75	0.35	2.53	4.45	4.28	5.49	7.51
5.	16.10	16.10	4.72	4.73	4.13	4.13	4.20	3.38	0.29	0.94	4.49	4.32	1.75	3.29
6.	16.11	16.09	4.68	4.68	4.17	4.17	4.15	2.89	0.26	1.35	4.41	4.24	1.79	3.31
7.	16.11	16.12	4.65	4.65	4.13	4.13	4.17	2.81	0.18	1.40	4.35	4.21	1.86	3.61
8.	16.10	16.11	4.70	4.69	4.10	4.11	4.13	2.20	0.32	2.07	4.45	4.27	2.27	3.75

I* Initial; F* Final; WSP: Water-soluble Phosphoric acid; CSP: Citrate Phosphoric acid

The reversion from citrate soluble phosphoric acid to citrate insoluble phosphoric acid took place slowly. Hence it was not considered a problem under the conditions prevailing during storage. Though the water-soluble phosphoric acid was reduced during the period of storage, the available from of phosphoric acid was not affected much, since the citrate soluble phosphoric acid increased proportionally and the mixture satisfied the guaranteed percentage of available phosphoric acid. Among the different particle sizes of the white clay, the 1 mm particle-size white clay was found to be the best filler than the rest as the absorption of moisture and the reversion of water-soluble phosphoric acid thereof was minimum in the mixture carrying the above filler.

It is therefore concluded that the white clay passing through 1 mm sieve can be used as a filler to the extent of 34% in the manure mixture, 16:4:4. The quality of the manure mixture can further be improved by adding ammonium sulphate and by reducing the proportion of the urea in the manure mixture.

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Effect of Bacterial Inoculation for Pulses Cultivated in Tamil Nadu

Fixation of atmospheric N in root nodules in the leguminous plants is an established fact. But the quantity of nodules found in the roots of the plants of the same crop, grown in different soils situated not far off from one another varies. This variation is attributed to the presence or absence of the proper N fixing bacteria in the various soils in sufficient quantities. To ensure the presence of proper N fixing bacteria and thereby to augment the fixation of N and inturn to get maximum yield, artificial inoculation of bacteria is resorted to. To find out the effect of artificial inoculation of bacteria on pulses cultivated in Tamil Nadu, experiments were conducted at the Pulses Section.

Jenkins *et al.* (1954) observed that bacterial inoculation of legumes was quite necessary for their proper establishment, when grown in new place.