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EFFECT OF ORGANIC MANURE AND INORGANIC FERTILIZERS ON THE DISEASE INCIDENCE IN RICE

Due to the non-availability of sufficient organic manures, and the increased cost of application, farmers have almost dispensed with the practice of application of organic manures. This has aggravated the incidence of diseases resulting from poor soil conditions and increased use of fertilizer nitrogen (Krishnaswamy, 1952 and Padwick, 1956). Potash application reduces the incidence of fungal diseases in rice (Corbetta, 1954).

In order to study the long term effects of organic manures and inorganic fertilizers on the rice crop of Onattukara in Kerala a permanent manurial trial was started in 1964 using local varieties with a NPK dose of 40:20:20 kg/ha. From 1972 onwards, the local variety was substituted by a high yielding variety Jaya with an NPK dose of 80:40:40 kg/ha. The sources of nutrients used are cattle manure (CM), ammonium sulphate (N), superphosphate (P) and muriate of potash (K). The treatments are as listed in Table 1. From 1988 second crop and 1989 first crop, the disease intensity was recorded. The major diseases were scored two weeks before harvest by observing all the hills in each random plots in each treatment and recorded as per cent according to standard evaluation system for rice diseases (Anon., 1975). Blight disease of rice caused by *Helminthosporium oryzae* was the major disease observed in the experimental field during both seasons.

Disease intensity was the least in plot where cattle manure alone was applied to supply 80 kg N/ha (T_1) during both seasons. This is in agreement with the findings of Stover (1962), Huber and Waston (1970), Rajan and Menon (1975) and Babu (1981) wherein organic amendments suppressed soil borne plant pathogens. During the second crop season disease score in no manure control (T_8) and N_oPK (T_5) were on par with cattle manure alone (T_1). In all other treatments where nitrogen is applied as ammonium sulphate the disease intensity was very high during both the seasons. This shows that nitrogen increases the incidence of disease more than the low supply of phosphorus and potassium. The results are supported by Krishnaswamy (1952) and Padwick (1956).

Application of cattle manure to supplement 25 per cent of N (T_7) requirement was not able to contain the disease in sandy soils of Onattukara (Table 1). This might be because of the low K retentivity of sandy soils coupled with the deficiency of Mg, Ca, and Mn as experienced by Tanaka and Yoshida (1970). Data on soil pH show that ammonium sulphate increases soil acidity and cattle manure acts as a buffer to maintain soil pH at optimum favourable for healthy growth of rice. Increased soil acidity aggravates the incidence of diseases as well.

Cattle manure acts as a soil

Table 1. Data on disease score, soil pH and grain yield

Treatments	Disease score (%)		Grain yield kg/ha		Soil pH	
	1988 Second crop	1989 First crop	1988 Second crop	1989 First crop	1988 Second crop	1989 First crop
T_1 Cattle Manure (CM)	20.17	13.17	3062	1995	5.05	5.45
T_2 N P_0K_0	62.57	49.57	119	595	4.35	4.73
T_3 N P K_0	58.67	55.76	856	595	4.50	4.65
T_4 N P_0 K	65.58	55.61	400	950	4.58	4.68
T_5 N_0 P K	52.18	23.19	15625	1175	4.90	5.18
T_6 N P K	59.17	51.00	1488	1183	4.58	4.90
T_7 CM-20 N-60 + PK	47.15	34.71	2438	1700	4.65	5.00
T_8 N_0 P_0 K_0	-	20.83	-	925	-	-
CD (0.05)	14.3	16.625	379.5	427	0.288	0.243

amendment too and can save application of lime if applied at right quantities. However, 5 t/ha of cattle manure (T_7) to supplement 25 per cent of fertilizer N was not enough in sandy soils of Onattukara. In organic farming (T_1), we can even save application of fungicides as well.

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