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Efficacy of Calcium Ammonium Nitrate as Compared to Other Sources of Nitrogen for Paddy

Calcium ammonium nitrate is a physiologically neutral fertilizer leaving neither acidic nor basic residue in the soil. Ammonium sulphate is physiologically acidic while sodium nitrate is physiologically basic. Wells (1964) and Balasubramaniam *et al.* (1967) stated that there was not significant difference in yield due to different sources of nitrogen, as CAN, ammonium sulphate and urea, and that CAN could be used as a straight nitrogen fertilizer for top dressing paddy. Sukanya Subramaniam *et al.* (1965) observed that for rice crop ammonium sulphate was superior to calcium ammonium nitrate. Nijhawan (1960) observed that application of CAN neither adds acidity nor alkalinity to the soil but supliments the losses of calcium that is being removed from soils every year by different crops. Prasad (1958) reported that CAN compares favourably with ammonium sulphate as a fertilizer for various crops.

A pot culture experiment was conducted with CO29 paddy in Wetland soils from E-block of Central Farm-Calcium ammonium nitrate, ammonium sulphate, and sodium nitrate were tried with and without green manures. Green manure was applied a fortnight prior to planting and super phosphate was applied at the rate of 30 lb P_2O_5 per acre to all the treatments. The yield of grain and straw due to treatments are presented in Table-1.

TABLE 1. Mean yield of grain and straw (g/pot)

Treatments	Yield	
	Grains	Straw
Control	4.4	7.5
Green manure at 60 lb N/ac	7.0	9.8
Green manure at 30 lb N/ac plus ammonium sulphate 30 lb N/ac	8.6	11.0
Green manure at 30 lb N plus calcium ammonium nitrate 30 lb/ac	7.4	10.9
Green manure at 30 lb N plus sodium nitrate at 30 lb N/ac	4.1	7.4
Calcium ammonium nitrate at 60 lb N/ac	7.3	10.5
Ammonium sulphate at 60 lb N/ac	5.6	8.6
Sodium nitrate at 60 lb N/ac	3.1	6.3
S. E.	0.1212	0.1315
C. D.	0.36	0.39

Maximum yield of grain was recorded due to application of nitogen at 30lb through green manure and the other 30 lb through ammonium sulphate followed by almost equal yield of grain in treatments with 60 lb N either completely as CAN or 30 lb N through CAN and the remaining through green manure. The yield of grain due to the application of 60 lb N through ammonium sulphate alone was significantly lower. The yield of grain with the application of sodium nitrate in combination with green manure was on par with the control. The treatments with the entire amount of N as sodium nitrate alone registered the lowest yield and was significantly lower than the control, indicating that it was not a good source of N for paddy crop under waterlogged conditions.

The data on straw yield revealed that the yield due to treatments 3 and 4 were on par. As in the grain yield the yield of straw due to sodium nitrate at 60 lb N was inferior to the other treatments. This deletereous effect was offset to some extent when 50 per cent of N was substituted by green manure (Treatmente 5).

It is evident that calcium ammonium nitrate alone was superior to ammonium sulphate in promoting grain and straw yields. Sodium nitrate registered the lowest yield indicating its unsuitability for paddy crop under waterlogged conditions. While the yield of grain due to application of ammonium sulphate in combination with green manure was superior to calcium ammonium nitrate in combination with green manure, the straw yields due to the above two treatments were however similar.

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