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EFFECT OF TIME OP HARVESTING AND NPK FERTILIZATION ON CRUDE FAT CONTENT OF GINGER

Ginger is one of the important cash crops of Maharashtra. Non-volatile ether extract is an important constituent contributing flavour to ginger, which varies from 2.25 to 5.35 per cent. Nutrition and time of harvesting are important factors which affect the crude fat content of ginger. In Maharashtra, the cultivators from the ginger growing area apply heavy doses of FYM, to the extent of 40 to 50 t/ha. Nowadays FYM is becoming a scarce and costly commodity. Hence, it is necessary to explore the possibilities of substituting partially the dose of FYM by chemical fertilizers for obtaining higher yields of quality ginger. The stage of maturity of rhizome has a significant influence on its quality characteristics and its suitability for processing. Therefore, it was thought worthwhile to conduct field experiments on the effect of application of NPK through FYM and fertilizers and also the time of harvesting on crude fat content of ginger.

Field studies were conducted during 1979-80 and 1980-81. There were 36 treatment combinations comprising six main plot treatments and six sub-plot treatments. The main-plots received application of 225 kg N, 90 kg P_2O_5 and 180kg K_2O/ha through FYM and fertilizers. These were, no FYM but only fertilizers (A), 10 t FYM/ha + fertilizers (B), 20 t FYM/ha + fertilizers (C), 30 t FYM/ha + fertilizers (D), sawdust which will supply the carbon equal to the carbon supplied by 10 t FYM/ha + fertilizers (E) and control (F). The sub-plot treatments were formed by the time of harvesting at 6, 7, 8, 9, 10 and 15 months after planting. The treatment combinations were replicated three times, in a split plot design with gross and net plot size of 5.85 m x 3.00 m and 4.50 m x 2.10 m. respectively. Planting was done at 22.5 cm x 22.5 cm on raised beds in the third week of May during both the years. The soils of the experimental plots were sandy clay loam in texture, low in total N (0.042%), and available P_2O_5 (19.35 kg/ha) and medium in available K_2O (283.09 kg/ha) and alkaline in reaction (pH 8.2). The crude fat (non-volatile ether extract) of ginger at harvest was estimated by distillation with solvent ether (40-60%) in soxhlet apparatus (A. O. A. C., 1975).

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Table 1

Effect of time of harvesting and NPK fertilization on crude fat content (%) in ginger

Nutrition	Harvesting time (months after planting)													
	1979 80							1980-81						
	6	7	8	9	10	15	Mean	6	7	8	9	10	15	Mean
A	5.28	5.68	5.78	5.89	6 13	6.69	5.91	5 20	5.52	5.61	5 65	5.93	6.83	5.80
B	5.13	5.45	5.77	5.86	6.27	6.87	5.90	5.20	5.33	5.55	5.71	6.16	6.89	5.81
C	5.38	5.62	5.75	6.29	6.76	7.15	6.16	5.41	5.49	5.86	6.12	6.45	6.90	6.04
D	5.66	5.66	5.81	6.50	6.88	7.39	6.31	5.63	5.75	5.79	5.82	6.70	6.94	6.11
E	5.18	5.37	5.62	5.73	5.83	6.12	5.64	5.14	5.28	5.51	580	5.91	5.93	5.60
F	4.80	5.25	553	5.63	5.69	5.85	5.46	5.10	5.14	5.24	5.51	5.55	5.89	5.41
Mean	5.24	551	5.71	5.98	6.26	6.68	5.90	5.28	5.43	5.59	5.77	6.12	6.57	5.79

Particular	S£ ±	*C. D. at* 5%	S. *E.* ±	C. D. *at 5%*
Nutrition	0.02	0 05	0.02	0.06
Harvesting time	0.02	0.06	0.02	0.06
Difference between two nutritional treatments at the same harvesting time	0.05	0.14	0.06	0.15
Difference between two harvesting times at the same level of nutrition	0.05	0.14	0 05	0.15

Data regarding the crude fat content in ginger rhizome on dry weight basis as affected by different treatments at harvest are given in Table 1. On an average, the crude fat content in ginger rhizome was 5.90 and 5.79 per cent during 1979-80 and 1980-81, respectively

The crude fat content was more from the treatments where 225 kg N, 90 kg P_2O_5 and 180 kg K_2O/ha were applied through 30 t FMY/ha + fertilizers (D) or 20 t FYM/ha + fertilizers (C) and less in control at all the harvestings. Thus, it could be said that ginger without nutrition and sawdust plus fertilizers reduces while the application of NPK either only through fertilizers or FYM plus fertilizers increases the crude fat content in ginger at all the harvestings. Further, increased quantity of FYM also increases the crude fat content nearly at all the harvestings. Nair and Das (1982) reported that the oleoresin content was significantly higher due to urea application. Saraswat (1972) from Indonesia, however, observed that the oleoresin content was significantly higher due to urea application. Saraswat (1972) from Indonesia, however, observed that the oil content of ginger was adversely affected by N application. The crude fat content was increased as the harvesting was delayed at all the nutritional treatments. Harvesting of ginger after 10 months from planting was found to be better extraction purpose in Australia (Sharpenel 1967 and Leverington, 1975). Aiyadurai (1966) reported that the oleoresin was maximum when ginger was harvested at 245 to 260 days after planting. Further, from these data, it would be seen that the climate had little effect on the interaction in crude fat content of ginger.

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