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NPK CONTENT OF SEED GRAIN AND STRAW INFLUENCED BY DIFFERENT ORGANIC NUTRIENT MANAGEMENT UNDER RICE BASED CROPPING SYSTEMS

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Abstract

Field experiments were conducted during 2011-12 and 2012-13 under National Project on Organic Farming, Department of Agronomy, Jabalpur (M.P.), India. During *kharif* season the NPK content in grain and straw of rice were higher in NM3 (1/3 N through FYM + VC + NEOC each + Panchgavya) under gm-rice-wheat cropping system and rice-berseem cropping system. During *rabi* season the NPK content of wheat and berseem grain and straw were higher under NM3 (1/3 N through FYM + VC + NEOC each + Panchgvya) than at par NM1 (1/3 N through FYM + VC + NEOC each) than NM5 (BD-501 + Panchagvya) during first and second year.

Key words : Organic nutrients management, cropping systems, NPK content, rice.

Introduction

In India, rice (*Oryza sativa* L) - wheat (*Triticum aestivum* L) is the dominant cropping system in Indo-Gangetic plains. Rice and wheat are the world's two most important cereal crops contributing 45% of the digestible energy and 30% of total protein in the human diet. Approximately 12.5 m ha area under this system contributed to 25% total food grain production of India (Prakash *et al.*, 2011). Organic nutrient management is basically a holistic management system, which promotes and improves the health of the agro-ecosystem related to biodiversity, nutrient biocycles, soil microbial and biochemical activities. Organic production systems are based on specific standards precisely formulated for food production and aim at achieving agro ecosystems, which are socially and ecologically sustainable (Saini and Pandey, 2009). Organic farming implies a farming system that primarily aims at cultivating land and raising crops under ecologically favorable conditions. The use of locally available agro-inputs in agriculture by avoiding or minimizing the use of synthetically compound of agro-chemicals appears to be one of the probable options to sustain the agricultural productivity.

Materials and Methods

Field experiments were conducted during 2011-12 and 2012-13 under National Project on Organic FARMING, Department of Agronomy Jabalpur (M.P.) Jabalpur is situated in the central part of Madhya Pradesh at 230 90' North latitude and 790 58' East longitude with an altitude of 411.78 metres above the mean sea level. The soil of the experimental field was sandy clay loam in texture, slightly alkaline in reaction (pH 7.70) with normal EC (0.48 dS/m) and low OC contents (0.68%), medium in available N (266 kg/ha), low in available P (9. 2 kg/ha) and medium in available K (300 kg/ha) contents. The experiment was laid out under split plot design consisting two cropping systems (gm-basmati rice-wheat and basmati rice-berseem) as main plot and five organic nutrient managements treatments (NM1-1/3 FYM+ 1/ 3VC+ 1/3NEOC, NM2-Panchagvya, NM3- 1/3 FYM +1/3VC+1/3 NEOC+ Panchagvya, NM4- BD-501, NM5-BD-501+Panchagvya) as sub-plot treatments replicated thrice.

Results and Discussion

NPK content of rice during *kharif* season

Data presented in table 1 indicated that during *kharif* season the NPK content in grain and straw of rice were higher in NM3 (1/3 N through FYM + VC + NEOC

Table 1 : N, P, K contents (%) in rice grain and straw as influenced by different organic nutrient management practices.

	Treatments	In grain						In straw					
		N		P		K		N		P		K	
		2011-12	2012-13	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13
GM-rice-wheat	NM1	1.68	1.66	0.28	0.29	0.53	0.54	0.47	0.46	0.022	0.023	1.74	1.74
	NM2	1.52	1.54	0.26	0.25	0.51	0.50	0.44	0.43	0.023	0.022	1.70	1.69
	NM3	1.70	1.72	0.30	0.29	0.55	0.55	0.48	0.48	0.027	0.029	1.75	1.75
	NM4	1.49	1.50	0.22	0.24	0.50	0.52	0.43	0.44	0.020	0.022	1.69	1.68
	NM5	1.60	1.62	0.21	0.22	0.52	0.52	0.45	0.45	0.019	0.020	1.70	1.69
Rice-berseem	NM1	1.68	1.70	0.29	0.28	0.53	0.55	0.44	0.44	0.024	0.021	1.72	1.72
	NM2	1.59	1.61	0.26	0.24	0.52	0.53	0.46	0.47	0.022	0.024	1.73	1.72
	NM3	1.79	1.75	0.32	0.31	0.56	0.58	0.49	0.50	0.029	0.030	1.76	1.77
	NM4	1.50	1.52	0.24	0.25	0.52	0.53	0.45	0.46	0.021	0.022	1.70	1.72
	NM5	1.62	1.64	023	0.24	0.54	0.54	0.46	0.45	0.020	0.023	1.72	1.71

Table 2 : N, P, K contents (%) in wheat grain and straw influenced by different organic nutrient management practices.

Treatments	In grain						In straw					
	N		P		K		N		P		K	
	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13
NM1-1/3 FYM+VC+NEOC each	1.75	1.75	0.43	0.44	0.58	0.59	0.47	0.48	0.12	0.13	1.62	1.63
NM2-Panchagvya	1.71	1.73	0.45	0.45	0.53	0.55	0.44	0.45	0.09	0.11	1.60	1.62
NM3-1/3 FYM+VC+NEOC each + Panchagvya	1.79	1.80	0.49	0.48	0.62	0.64	0.48	0.48	0.14	0.16	1.64	1.66
NM4-BD-501	1.73	1.72	0.46	0.45	0.56	0.58	0.45	0.45	0.11	0.11	1.61	1.60
NM5-BD-501 + Panchagvya	1.74	1.73	0.47	0.46	0.57	0.57	0.46	0.47	0.12	0.12	1.62	1.62

Table 3 : N, P, K contents (%) in berseem seed as influenced by different organic nutrient management practices.

Treatments	In grain					
	N		P		K	
	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13
NM1-1/3 FYM + VC + NEOC each	1.79	1.80	0.52	0.52	0.92	0.93
NM2-Panchagvya	1.76	1.75	0.49	0.50	0.88	0.89
NM3-1/3 FYM + VC + NEOC each + Panchagvya	1.83	1.84	0.53	0.53	0.96	0.98
NM4-BD-501	1.74	1.73	0.48	0.47	0.90	0.92
NM5-BD-501 + Panchagvya	1.78	1.77	0.50	0.49	0.94	0.93

Table 4 : N, P, K contents (%) in berseem fodder as influenced by different organic nutrient management practices.

Treatments	In fodder					
	N		P		K	
	2011-12	2012-13	2011-12	2012-13	2011-12	2012-13
NM1-1/3 FYM + VC + NEOC each	0.69	0.70	0.13	0.15	1.78	1.77
NM2-Panchagvya	0.65	0.67	0.11	0.12	1.75	1.76
NM3-1/3 FYM + VC + NEOC each + Panchagvya	0.72	0.74	0.16	0.18	1.80	1.82
NM4-BD-501	0.68	0.68	0.13	0.14	1.73	1.74
NM5-BD-501 + Panchagvya	0.70	0.72	0.12	0.13	1.76	1.76

each + Panchgavya) than at par with the NM1 followed by NM5. The lowest NPK content were observed in treatment NM4 under gm-rice-wheat cropping system during both the years.

NPK content of grain and straw of rice under rice-berseem cropping system higher in treatment NM3 (1/3 N through FYM + VC + NEOC each + Panchgavya) than at par with NM1 (1/3 N through FYM + VC + NEOC), during both the years.

NPK content of wheat and berseem during *rabi* season

Data presented in table 2 indicated that during *rabi* season the NPK content of wheat grain and straw were higher under NM3 (1/3 N through FYM + VC + NEOC each + Panchgvya) than at par NM2 (1/3 N through FYM + VC + NEOC each) than NM5 (BD-501 + Panchagvya) during first and second year.

Data presented in tables 3 & 4 indicated that the NPK content of berseem grain and fodder were also higher under NM3 (1/3 N through FYM + VC + NEOC each + Panchgvya) than at par NM1 (1/3 N through FYM + VC + NEOC each) than NM5 (BD-501 + Panchagvya). The lowest NPK content were recorded under treatment NM4 (BD-501) than NM2 (Panchagvya).

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