



Effect of Integrated Nutrient Management on Influence of Dry Matter Production and Post Harvest Soil Analysis in Ashgourd (*Benincasa hispida* cogn.) cv. CO-1

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Abstract

An investigation on effect of integrated nutrient management on post harvest soil analysis in ashgourd (*Benincasa hispida* cogn.) cv. CO-1 was undertaken at Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalai Nagar during 2013-2014. The results of the study indicated that précised application of various organic inputs with inorganic fertilizer had significant influence of post harvest soil analysis. Application of FYM @ 10 kg pit⁻¹ plus 50 per cent RDF plus EM @ 1:1000 dilution significantly increased the post harvest soil available nitrogen, post harvest soil available phosphorous and post harvest soil available potassium in ashgourd.

Key words: Ashgourd, Soil, Nitrogen, Phosphorous, Potassium

INTRODUCTION

Ashgourd (*Benincasa hispida* cogn.) is an important cucurbitaceous vegetable grown widely in tropical regions of the world. It has a greater demand in export market due to waxy coat of the fruit which ensures outstanding storage quality. It is available even in the lean period when other vegetables are scarce. Among the cucurbitaceous vegetables, ashgourd has shown the longest shelf life and higher profitability to marginal farmers. It is a very common crop and only a few varieties with high yield potential and better quality have been released. In spite of its many advantages, research thrust has not been given for the improvement of this vegetable. Among the various strategies followed to improve the productivity of a crop, integrated nutrient management plays a significant role. INM involves the integrated use of mineral fertilizers in combination with organic manures along with microbial inoculants to sustain optimum yield and to maintain and improve the soil fertility (Abrol and Katyal, 1990). Integrated nutrient supply has become an accepted strategy to bring about improvement in soil fertility and protecting the environment. Various organic and inorganic inputs viz., Farm yard manure, Poultry manure, Panchakavya,



Effective microorganisms, and Recommended dose of fertilizers (RDF) are very effective to improve the growth, yield and quality characters. Hence, the present study was conducted to find out the suitable combination of organic nutrients and inorganic fertilizer or dry matter production and post harvest soil analysis of ashgourd (*Benincasa hispida* cogn.) cv.CO-1.

MATERIALS AND METHODS

The present experiment on “Effect of integrated nutrient management on growth and flowering characters in ashgourd (*Benincasa hispida* cogn.) cv. CO-1.” was undertaken at Department of Horticulture, Faculty and Agriculture, Annamalai University, Annamalai Nagar during 2013-2014. The experiments includes six treatments viz., T₁ - FYM + 100 % RDF, T₂ - FYM + 75 % RDF + EM, T₃ - FYM + 75 % RDF + Panchakavya, T₄ - FYM + 75 % RDF + EM + Panchakavya, T₅ - PM + 100 % RDF, T₆ - PM + 75 % RDF + EM, T₇ - PM + 75 % RDF + Panchakavya, T₈ - PM + 75 % RDF + EM + Panchakavya, T₉ - FYM + 50 % RDF + EM, T₁₀ - FYM + 50 % RDF + Panchakavya, T₁₁ - FYM + 50 % RDF + EM+ Panchakavya, T₁₂ - PM + 50 % RDF + EM, T₁₃ - PM + 50 % RDF + Panchakavya, T₁₄ - PM + 50 % RDF + EM + Panchakavya. (FYM-Farmyard manure, PM-Poultry manure, RDF-Recommended dose of fertilizer as soil application, EM-Effective microorganisms and Panchakavya as foliar spray). The experiment was laid out in a Randomized Block Design and replicated in three times. Biometrical observations viz., dry matter production, post harvest soil available nitrogen, post harvest soil available phosphorous and post harvest soil available potassium were taken from all the vines in each treatment and replication. Soil samples were collected from the experimental plots at a depth of 20-30 cm after the completion of harvest of the crop. The samples were dried under shade, powdered, sieved and used for analysis. The data were subjected to statistical analysis as suggested by Panse and Sukhatme (1978). The site is geographically situated at 11° 24' N latitude 79° 44' E longitude and at an altitude of + 5.79 m above mean sea level. The soil of the experimental plot is clay loam with pH of 7.81 and EC 0.76 millimhos cm⁻¹.

RESULTS

Effect of INM on dry matter production in ashgourd

It can be observed from the data in table 1 that significant differences existed among the various treatments. The dry matter production was found to be the maximum in the treatment T₈ (PM @ 3 kg pit⁻¹ plus 75 per cent RDF plus EM @ 1:1000 dilution plus panchakavya @ 3 per cent) which registered a value of 682.06 g plant⁻¹. Application of FYM @ 10 kg pit⁻¹ plus 75 per cent RDF plus EM @ 1:1000 dilution plus panchakavya @ 3 per cent (T₄) had recorded the next



best value of 659.17 g plant⁻¹. The treatment T₇ and T₆ lied on par with each other. The minimum dry matter production was recorded in the treatment T₉ (399.54 g plant⁻¹).

Effect of INM on post harvest soil analysis in ashgourd

The computed data pertaining to the nitrogen availability in the soil due to the effect of various organic and inorganic inputs are presented in table 2. Significant influences were observed between the treatments for this trait. Among the various treatments, the highest nitrogen availability in soil was observed in the treatment T₉ (FYM @ 10 kg pit⁻¹ plus 50 per cent RDF plus EM @ 1:1000 dilution) which recorded a value of 224.86 kg ha⁻¹. This was followed by the treatment T₁₂ (220.44 kg ha⁻¹). The lowest nitrogen availability in soil was recorded in the treatment T₈ (186.11 kg ha⁻¹, 6.67 kg ha⁻¹ and 217.69 kg ha⁻¹).

Significant variations was noticed among the treatments with respect to phosphorus availability in the soil (Table 3). Application of FYM @ 10 kg pit⁻¹ plus 50 per cent RDF plus EM @ 1:1000 dilution (T₉) had resulted in the maximum phosphorus availability in the soil (10.17 kg ha⁻¹). The treatment T₁₂ (PM @ 3 kg pit⁻¹ plus 50 per cent RDF plus EM @ 1:1000 dilution) was found to be the next best (9.72 kg ha⁻¹). The least value of 6.67 kg ha⁻¹ was observed in the plots which received the application of PM @ 3 kg pit⁻¹ plus 75 per cent RDF plus EM @ 1:1000 dilution plus panchakavya @ 3 per cent (T₈).

The data recorded on the effect of INM on potassium availability in is furnished in the table 4. The maximum potassium availability of soil (264.98 kg ha⁻¹) was observed in T₉ which received the application of FYM @ 10 kg pit⁻¹ plus 50 per cent RDF plus EM @ 1:1000 dilution. Application of PM @ 3 kg pit⁻¹ plus 50 per cent RDF plus EM @ 1:1000 dilution (T₁₂) had recorded the next best value (258.13 kg ha⁻¹). The potassium availability of soil was found to be the least in the treatment T₈ (217.69 kg ha⁻¹).

DISCUSSION

Stephenson *et al.* (1990) and Oladotun (2002) reported that poultry manure contains macro and micro nutrients such as N, P, K, S, Ca, Mg, Cu, Mn, Zn, Bo and Fe. Panchakavya suppresses the pathogen by encouraging the local antagonists of the pathogen leading to increased vigour in tomato, resulting in increased root length and maximum dry weight, which paves way for heavy yield. This might be due to the increased translocation of stored carbohydrates and amino acids contributed by the nutrients of panchakavya and other metabolites to the major storage organs of the plant, where these were utilized for the formation of secondary metabolites (Vadivel, 2007). This might be due to the slow release of nutrients from the FYM, resulting in the lesser loss and further availability of nutrients can also be achieved in due course of time due



to degradation. The use of EM increases fermentation and decomposition of organic matter and release greater quantities of these three essential elements in inorganic and organic forms. This in turn enhances the fertility of the soil and thereby its quality and sustainability

From the present investigation, it may be concluded that application of FYM @ 10 kg pit-1 plus 50 per cent RDF plus EM @ 1:1000 dilution was found to have beneficial effect on post harvest soil analysis in ashgourd (*Benincasa hispida* cogn.) cv. CO-1.

Table 1. Effect of INM on dry matter production in ashgourd
(*Benincasa hispida* cogn.) cv. CO-1.

Treatments	Dry matter production (g plant ⁻¹)
T ₁	538.82
T ₂	591.02
T ₃	594.11
T ₄	659.17
T ₅	570.82
T ₆	626.41
T ₇	631.82
T ₈	682.06
T ₉	399.54
T ₁₀	425.07
T ₁₁	492.87
T ₁₂	437.89
T ₁₃	488.53
T ₁₄	527.34
SEd	10.10
CD (p=0.05)	20.18



**Table 2. Effect of INM on post harvest soil available nitrogen in ashgourd
(*Benincasa hispida* cogn.) cv. CO-1.**

Treatments	Post harvest soil available Nitrogen
T ₁	207.13
T ₂	205.81
T ₃	200.12
T ₄	193.86
T ₅	206.55
T ₆	199.67
T ₇	194.11
T ₈	186.11
T ₉	224.86
T ₁₀	217.11
T ₁₁	212.19
T ₁₂	220.44
T ₁₃	216.68
T ₁₄	211.72
SEd	1.34
CD (p=0.05)	2.76



Table 3. Effect of INM on post harvest soil available phosphorous in ashgourd
(*Benincasa hispida* cogn.) cv. CO-1.

Treatments	Post harvest soil available Phosphorous
T ₁	8.62
T ₂	7.99
T ₃	7.83
T ₄	7.04
T ₅	8.02
T ₆	7.59
T ₇	7.31
T ₈	6.67
T ₉	10.17
T ₁₀	9.45
T ₁₁	8.81
T ₁₂	9.72
T ₁₃	9.07
T ₁₄	8.79
SEd	0.11
CD (p=0.05)	0.23



**Table 4. Effect of INM on post harvest soil available Potassium in ashgourd
(*Benincasa hispida* cogn.) cv. CO-1.**

Treatments	Post harvest soil available Potassium
T ₁	235.54
T ₂	231.93
T ₃	225.67
T ₄	219.94
T ₅	233.86
T ₆	224.16
T ₇	220.68
T ₈	217.69
T ₉	264.98
T ₁₀	252.36
T ₁₁	243.72
T ₁₂	258.13
T ₁₃	250.97
T ₁₄	241.92
SEd	1.69
CD (p=0.05)	3.37

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