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Performance of cashew under organic conditions in Maidan area of Karnataka

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ABSTRACT

The study was undertaken during March 2012 to April 2014 in the Bannur village of Chickmagalore district of Karnataka. The experiment was laid out in a split plot design with Ullal 3 variety of cashew on 9 year old 5 plants with 4 replications. The data revealed that in 2012-13 the stem girth, plant height and number of nuts per plant were higher (42.10 cm, 460 cm and 2730.8 respectively) in inorganic system and lower (41.05 cm, 454.65 cm and 2658.2 respectively) in organic system. However the weight of carnal and nut and yield were higher (2.90 g, 7.81 g and 4152 kg/ha respectively) in organic system as compared to inorganic system (2.57 g, 7.40 g and 4040 kg/ha respectively). The trend remained same in the year 2013-14 as the stem girth, plant height and number of nuts per plant were higher (42.15 cm, 461.90 cm and 2751 respectively) in inorganic system and lower (41.90 cm, 459.55 cm and 2712.2 respectively) in organic system.

Keywords: Organic farming. cashew nut, yield, soil organic matter

INTRODUCTION

Cashew, *Anacardium occidentale* L is a tropical evergreen fruit crop that produces the cashew nut and the cashew apple. It can grow as high as 14 metres (46 ft) but the dwarf cashew growing up to 6 metres (20 ft) has proved more profitable with earlier maturity and higher yields. The cashew nut is served as a snack or used in recipes like other nuts although it is actually a seed. The cashew apple is a fruit whose pulp can be processed into a sweet, astringent fruit drink or distilled into liquor. The shell of the cashew nut yields derivatives that can be used in many applications from lubricants to paints and other parts of the tree have traditionally been used for snake-bites and other folk remedies. In India cashew cultivation is confined to peninsular region. Cashew nuts are popular snack and food source. Cashews unlike other oily tree nuts contain starch to about 10 per cent of their weight. This makes them more effective than other nuts in thickening water-based dishes such

as soups, meat stews, and some Indian milk-based desserts. Cashew is an important export earning crop of the country which has earned a foreign exhange of Rs 2598 crores through export of cashew kernel and an additional Rs 31.85 crores by export of the cashew nut shell liquid in 2010-11 (http://dacnet. nic.in/cashew cocoa/stat.htm#stat.). It is generally grown as a rainfed crop on neglected land unsuitable for any other crops (Rejani and Yadukumar 2006, Rejani and Yadukumar 2010).

Increased/indiscriminate use of chemical fertilizers and pesticides during green revolution period resulted in several harmful effects on soil, water and air causing pollution. This has reduced the productivity of the soil by deteriorating soil health in terms of soil fertility and biological activity. The excess/indiscriminate use of pesticides has led to the entry of harmful compounds into food chain, death of natural enemies and development of resurgence/resistance to pesticides. Hence enhancement and maintenance of system productivity and resource quality is essential for sustainable agriculture. It is believed that organic farming can solve many of these problems as this system is believed to maintain soil productivity and pest control by enhancing natural processes and cycles in harmony with environment. Organic farming is favorable to small farmers. They already have the cows and buffalos needed to recycle biomass at the farm level which is essentially the foundation of organic farming.

MATERIAL and METHODS

The study was conducted during March 2012 to April 2014 in a farmer's orchard at Bannur village of Chickmagalore district of Karnataka which was organically certified (ICS-1, ICS-2 and ICS-3) under cluster approach organic conversion programme of Karnataka state. The experimentation site is classified under central dry zone situated in the south-western part of Karnataka. The trial was laid on 9 years old cashew plantations Ullal 3 variety grown at 30 x 30 feet spacing (80 plants per acre) planted on June 2004 in 5 acres.

In inorganic system 10-15 kg of farm yard manure, N (500 g N, 1.1 kg urea), P_2O_5 (125 g, 625 g rock phosphate) and K_2O (125 g, 208 g muriate of potash) per tree per year were given. Root and stem borer infestation was controlled by swabbing tree trunks with carbaryl (2%). Tea mosquito bugs were controlled by three sprays at flushing, flowering and fruiting stages with endosulfan or monocrotophos (0.05%) as the first and second sprays and carbaryl (0.15%) as third spray. Stem and root borer (*Plocaecderus ferrugineus* L) was controlled by swabbing the trunk and exposed roots with carbaryl (0.2%) and applying Sevidol 8G (75 g/tree) in the basin around the tree. In

organic system 20-25 kg FYM and 2-3 kg of vermicompost were applied along with green manure. Vermiwash was sprayed 3 times @ 5 ml per liter of water and organically certified Bio-N, Bio-potash and Bio-K were applied @ 250 g per plant.

The growth parameters such as plant height, stem girth, canopy height and canopy diameter in E-W and N-S directions were recorded. The ground coverage by canopy was worked out using procedure given below:

$$\text{Radius (r) of canopy (m)} = \frac{D1 + D2}{4}$$

where D1= canopy diameter (m) in E-W direction, D2= canopy diameter (m) in N-S direction

Ground coverage by canopy (m^2), $A = \eth r^2$, per cent ground coverage by canopy= ground coverage by canopy/actual area on the ground for example. Actual area for spacing of 10 m x 5 m was 50 m^2.

Cashew nut yield was recorded year-wise from four trees in each treatment. The collected nuts were counted and weighed. Fresh and dry weights of a sub-sample of 100 nuts from each tree were determined. The dry weight was recorded after sun-drying the nuts for six days. The weight per nut including shell was determined at 14 per cent moisture as per the industrial standard. The nut yield/tree was calculated as follows:

Nut yield = Mean nut weight x total number of nuts/tree

Data were also collected from secondary sources of information such as reports of Department of Horticulture, Agriculture, NCOF. Discussions were held with officials of these departments, experts and executives to elicit their views and opinion on the important issues pertaining to organic farming and its impact.

The data collected were tabulated, processed and analysed using simple statistical tools like frequency and percentage.

RESULTS and DISCUSSION

It is revealed from Table 1 that the girth of stem, height of plant and number of nuts per plant were higher in inorganic system as compared to organic system of farming whereas weight of carnal and nut and yield per hectare were higher in organic system during both the years of study.

Table 1. Plant growth and yield parameters in cashew during 2012-13 and 2013-14

	2012-13		2013-14	
Parameter	Organic	inorganic	Organic	inorganic
Stem girth (cm)	41.05	42.10	41.90	42.15
Plant height (cm)	454.65	460	459.55	461.90
Weight of carnal (g)	2.90	2.57	2.99	2.59
Weight of nut (g)	7.81	7.40	7.90	7.46
# nuts/plant	2658.20	2730.80	2712.20	2751
Yield (kg/ha)	4152	4040	4290	4104

The data reveal that in 2012-13 the stem girth, plant height and number of nuts per plant were higher (42.10 cm, 460 cm and 2730.8 respectively) in inorganic system and lower (41.05 cm, 454.65 cm and 2658.2 respectively) in organic system. However the weight of carnal and nut and yield were higher (2.90 g, 7.81 g and 4152 kg/ha respectively) in organic system as compared to inorganic system (2.57 g, 7.40 g and 4040 kg/ha respectively). The trend remained same in the year 2013-14 as the stem girth, plant height and number of nuts per plant were higher (42.15 cm, 461.90 cm and 2751 respectively) in inorganic system and lower (41.90 cm, 459.55 cm and 2712.2 respectively) in organic system. It shows that though the plant growth parameters like girth and height of the plants and number of nuts were more in case of inorganic system the desirable characters from economic point of view viz weight of carnal and nut as well as yield per hectare were more in the organic system.

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