

## Evaluation of Different Cropping Systems under Organic, Inorganic and Integrated Production Systems

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**Abstract :** Any kind of research on production technology of individual crop / commodity /breed has not brought sustainability or stability in crop production. The sustainability of the system over years depends on the maintenance of the soil health. Organic production system includes use of organic manures, biofertilizers, green manuring for nutrient supply and biopesticides for plant protection helps to sustain the productivity even under adverse climatic condition. The study was initiated to evaluate the performance of different cropping systems under organic, inorganic and integrated production systems at The Institute of Organic Farming, University of Agricultural Sciences, Dharwad (Karnataka-India) under ICAR Network Project on Organic Farming. The trial was conducted for four years (2013-14 to 2016-17) on fixed site. Five cropping systems viz., sequence cropping of cowpea - safflower, greengram- rabi sorghum, maize-bengalgram, sole cropping of pigeonpea and intercropping of groundnut + cotton were evaluated under six nutrient management practices. The nutrient management practices are NM1 (100% Organic farming (Organic manures equivalent to 100% N (Cereals/cotton) or 100% P2O5 (Legumes), NM2 (75% Organic farming (Organic manures equivalent to 75% N (Cereals/cotton) or 100% P2O5 (Legumes) + Cow urine and Vermi-wash application), NM3 (Integrated farming (50% Organic + 50% Inorganic nutrients, NM4 (Integrated farming (75% Organic + 25% Inorganic nutrients, NM5 (100% Inorganic farming (Recommended dose of inorganic fertilizers)) and NM6 (Recommended dose of inorganic fertilizers + Recommended rate of farm yard manure (FYM). Among the cropping systems evaluated for different production systems indicated that the Groundnut + Hybrid cotton (2:1) intercropping system found more remunerative as compared to Sole pigeonpea cropping system, Greengram-Sorghum sequence cropping system, Maize-Chickpea sequence cropping system and Cowpea-Safflower sequence cropping system irrespective of the production systems. Production practices involving application of recommended rates of fertilizers + recommended rates of organic manures (Farmyard manure) produced higher net monetary returns and higher B:C ratio as compared to integrated production system involving application of 50 % organics + 50 % inorganic and application of 75 % organics + 25 % inorganic and organic production system only Both the two organic production systems viz., 100 % Organic production system (Organic manures equivalent to 100 % N (Cereals/cotton) or 100 % P2O5 (Legumes) and 75 % Organic production system (Organic manures equivalent to 75 % N (Cereals) or 100 % P2O5 (Legumes) + Cow urine and Vermi-wash application) are found to be on par. Further, integrated production system involving application of organic manures and inorganic fertilizers found more beneficial over organic production systems.

**Keywords :** cropping systems, production systems, cowpea, safflower, greengram, pigeonpea, groundnut, cotton

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