



E-ISSN: 2618-0618

P-ISSN: 2618-060X

© Agronomy

www.agronomyjournals.com

2024; SP-7(1): 85-88

Received: 08-11-2023

Accepted: 13-12-2023

Narinder Panotra

School of Biotechnology,
SKUAST, Jammu, Chatha,
Jammu & Kashmir, India

Vikas Sharma

Division of Soil Science, SKUAST-
Jammu, Jammu & Kashmir, India

Romesh Kumar Salgotra

School of Biotechnology,
SKUAST, Jammu, Chatha,
Jammu & Kashmir, India

Manmohan Sharma

School of Biotechnology,
SKUAST, Jammu, Chatha,
Jammu & Kashmir, India

Vinod Gupta

Division of Agril. Extension
Education, SKUAST, Jammu,
Jammu & Kashmir, India

Harsimran Bindra

School of Biotechnology,
SKUAST, Jammu, Chatha,
Jammu & Kashmir, India

Ritika Gupta

Division of Agronomy, SKUAST,
Jammu, Jammu & Kashmir, India

Himani Sharma

Division of Agronomy, SKUAST,
Jammu, Jammu & Kashmir, India

Corresponding Author:

Narinder Panotra

School of Biotechnology,
SKUAST, Jammu, Chatha,
Jammu & Kashmir, India

International Journal of Research in Agronomy

Status and prospects of organic crop management in Jammu and Kashmir

Narinder Panotra, Vikas Sharma, Romesh Kumar Salgotra, Manmohan Sharma, Vinod Gupta, Harsimran Bindra, Ritika Gupta and Himani Sharma

DOI: <https://doi.org/10.33545/2618060X.2024.v7.i1Sb.241>

Abstract

Crop residues, manure, farm yard manure, vermicompost, biogas solution, green manure, poultry manure are the major components of organic agriculture. It is an integral part of organic agriculture that helps in activating the biological, physical and chemical properties of the soil. Organic agriculture/farming is not a new concept it has been followed in India as well as Jammu and Kashmir since prehistoric times and is one of the most effective methods of sustainable agriculture of all times. The last two decades have witnessed remarkable sensitivity in the global community towards ensuring food quality and environmental protection. Good promoters of organic agriculture believe that it can meet these demands and become a medium for overall development of rural areas. After nearly a century of neglect, organic agriculture is now making its way into the mainstream of development and is showing very good prospects from commercial, social and environmental perspectives. The founders' concerns for healthy food, healthy people, healthy soil, environmental sustainability and productivity are now at its core. In organic farming, natural methods are adopted for good crop production and without harming the fertility of the soil like integration of crops, mulching, crop rotation, inter-cropping, biological pest control, composting, use of local farm inputs and livestock etc.

Therefore, it is necessary to promote organic farming throughout the world to maintain soil fertility as well as preserve the environment.

Keywords: Organic agriculture, crop management, soil fertility and organic products

Introduction

Organic farming is receiving more attention around the world recently due to increasing awareness of the health risks of chemical agriculture. Consumers are waking up and questioning the ethics of promoting poison in our food chain. They are also willing to pay for chemical-free, environmentally sensitive and safe food products. Agrochemicals like pesticides, herbicides, fertilizers, growth promoters etc. are affecting human health, plant health, soil health, animal health, water bodies and environment. Traces of these chemicals have been found in food products, milk-based products, and even breast milk. After the Green Revolution, our agricultural scenario has completely changed with the use of modern technology. The increased uses of chemical fertilizers as well as the use of plant protection measures and high yielding varieties have undoubtedly increased our production, but the quality of the produce has declined. (Raina 2019) ^[17].

Organic farming is most relevant for 74% of small and marginal farmers in India as they lack the resources to provide expensive inputs to increase yields and they also need to protect the land from erosion. In the organic farming system approach, a piece of land is used optimally and to its full potential to produce nutritious and healthy food as well as other essential commodities, thereby supporting a small family healthily. There is a need to maintain soil health and productivity through agricultural practices based on the principles of nature. Plant protection is also controlled and managed by selecting crop mixtures and using biological control measures (GoI 2016) ^[18]. Consumers are now turning to organic food because they believe it to be tastier, as well as healthier, both for themselves and environment (Alfoldi *et al.* 1998) ^[19].

The Union Territory of Jammu and Kashmir consists mainly of two geographical regions, namely the Jammu and Kashmir region which lies in the north of the Indian Union and includes the extreme western part of the Himalayas.

Jammu region is represents almost all the zones ranging from sub-tropical one to mid hills extending to high hills (high altitudes) thus constituting temperate zone. Rice, maize, wheat, pulses, fodder, oil seeds, potato and barley are the main crops of the region. Farmers in Jammu and Kashmir have been farming without the use of chemicals for a long time, but now with the increasing demand for organic products across the world, the state has started the practice on a large scale. The state is a natural place for organic farming, the state has immense potential to produce high value crops like black cumin, guchi, basmati rice, raj mash, wheat, pulses and other field crops.

Scope and Potential of Organic Farming

Organic farming has become of utmost importance even in dry land areas. The soil and climatic conditions of India's dry lands make them particularly suitable for organic agriculture. These are actually better suited to low-input farming systems that make adequate use of biodiversity (Sharma, 2000) [13].

The addition of organic matter, a cornerstone of organic farming practices, will not only improve the physical condition of these dryland soils, but also greatly improve their ability to supply balanced plant nutrients. In dry lands, natural resources are overexploited (Reddy, 2010) [11] mainly due to inappropriate production-enhancing technologies.

Organic farming is done on about 50 thousand hectares of land in Jammu and Kashmir and this includes organic certified area of 18,441.82 hectares and 29150.00 hectares organic area under wild collection. During the year 2021-22, organic farm production in Jammu and Kashmir was 38,640.64 MT and organic production from wild area was 3,064.02 MT and 539.55 MT of organic products were exported and valued at about Rs 8.92 crore (Source: APEDA 2022-23).

Abundant use of chemical fertilizers results in soil acidity/salinity, decrease in porosity thus poor soil health in Jammu and Kashmir. Apart from this free nitrate from nitrogenous fertilizers and pesticide residues result in water pollution. These fertilizers add lead and cadmium in the soil.

Considering the above facts and factors, there is need for another revolution called organic revolution to ensure good soil health, food security, and reduced environmental pollution. Therefore

Table 2: Some common green manure legume crops and their potential nitrogen contribution

Green manure crop	Growing season	Green manure(t/ha)	N contribution(kg/ha)
Sunnhemp (<i>Crotalaria juncea</i>)	wet	21.2	91
Dhaincha (<i>Sesbania aculeate</i>)	wet	20.2	86
Green gram(<i>Vigna radiate</i>)	wet	8	42
Cowpea (<i>Vigna sinensis</i>)	wet	15	74
Cluster bean	wet	20	68
Senji (<i>Melilotus alba</i>)	dry	28.6	163
Berseem (<i>Trifolium alexandrinum</i>)	dry	15.5	67

The major contributors of organic manure are cattle and buffalo which have potential of about 7 million tons of N, P₂O₅ and K₂O. The next important source is night soil. If properly exploited can provide about 5 million tons of N, P₂O₅ and K₂O.

- Only 50% of manorial potential of live stock is utilized and unfortunately 50% is lost as fuel and dropping in non-agricultural lands.
- Crop residue of major like maize, wheat, rice, pearl millet, cotton and sugarcane trash has potential of about 2.5 million

there is need and that too urgent for rejuvenating the tired, over worked, degraded, polluted and malnutrition soil to make it potent for future food production.

Agronomic Manipulations

A) Soil preparations: Ploughing soil (tillage) up to depth of 30 cm help to expose soil for better aeration and sunlight will help in killing the eggs, larvae of many insects.

B) Crop selection: To begin with, crops which require low nutrient should be selected.

C) Nutrient Management: As we know organic farming systems the nutrient needs of crop plants are met through organic sources.

Table 1: Products for use in fertilization and soil conditioning in organic agriculture

Fertilization	Nature of use
Chemical and synthetic fertilizers	Banned
FYM, poultry manure, Vermicompost	Permitted
Compost from organic residues	Permitted
Green manure, green leaf manure	Permitted
Azolla	Permitted
Crop residue, straw, ground nut haulms, mulches	Permitted
Kitchen waste, mushroom bed waste	Permitted
Oil cake	Restricted
Human excrement	Restricted
Sewage sludge	Banned
Biofertilizers	Restricted
Gypsum	Restricted
Basic slag	Restricted

Some products are restricted due to bad impact on environment due to excess use.

Green Manuring

Green manuring for improving productivity and soil fertility is an old age practice with the farmers. Green manure offers considerable potential as source of N and organic matter. The availability of P, K and secondary and trace elements in the soil is also increased. Sunhemp, dhaincha, cowpea are commonly grown green manure crops in India. The amount of N accumulated in 45-60 days old green manure crop range from 42-201 kg/ha.

tones.

- Bulky organic manure viz FYM, compost, crop residue supply low quantities of major nutrients.
- If potential of rural and urban compost is estimated they can supply 800 and 16 million tones

Beneficial effect of organic manures:

- High export potential.
- Less competitors

- Acts as micronutrient chelates.
- Organic manure acts as a slow-release source of nutrients
- It acts as a buffer against soil pH changes
- Water holding capacity is increased.
- Its dark color contributes to the absorption of energy from the sun
- Soil erosion is checked.
- The organic components in humic substances can act as plant growth stimulants.

Crop residue/legume residue recycling

Crop residues affect the productivity of the soil and mulch on the surface is also quite appreciable. They are potential source of plant nutrients and their incorporation into the soil helps to return apart of nutrients drawn from the soil. Crop residue of annual grain legume such as green gram, black gram, and soybean can be recycled into soil after grain is removed. About 50-70 kg N/ha is estimated as residual N to the succeeding crop by pulse residue incorporation.

Legumes in rotation

The N content in leaves of tree legumes used for green leaf manure is usually high, ranging from 3.49 to 4.20%. The phosphorus content in green manure crops ranges from 0.20 to 3.34%. Green leaf manure has lower P content (0.2 to 0.24%) than legume green manure. The average N concentration in different legume crops ranges from 2.5 to 3.91% and the straw of food legumes have a comparatively low N content, ranging from 1.70% in cow pea residue to 2.21% in moong bean, because food legumes are harvested near maturity when straw N is translocated into grain.

Table 3: Estimation of biological N fixation by some legumes

Crop	N fixed (kg/ha/year)
Lucerne	100-200
Red clover	100-150
Cowpea	53-885
Ground nut	112-152
Lentil	35-100
Green gram	50-55
Soybean	49-130
Pea	46

Insect pest management

Prior to the introduction of crop protection chemicals man evolved several cultural and physical manipulation of controlling pests which reduced the damage potential to crops of essentially all pests agricultural practices like tilling; use of clean seed; regulating irrigations; use of resistant varieties: manuring; clean culture; cropping sequence and trap crops; adjusting time of sowing. Pest and disease control is achieved only by selection of suitable varieties, balanced crop rotation, mechanical cultivation, protection of natural enemies of pests, using botanical and biological pest control methods. Pest and disease management is achieved through encouraging balanced host predator relationships and increasing beneficial insect populations. Biological, cultural control and mechanical involve removal of pests and affected plant parts.

Conclusion

- Organic farming requires higher levels of labour, therefore creating more income-producing jobs per farm, the cost of an organic product is usually 10%-40% higher than similar conventional crops and it depends on both input and output

factors of crop production.

- Tourism an important contributor of state economy could be further enhanced by broadening its scope as Organic Agro-Tourism.
- Organic foods have proven to be better in terms of health and safety.
- Only developing the supply chain mechanism across towns of J&K even though it is uncertified, farmers will fetch higher price. It is a general global experience that organic produce of local area is trusted and preferred more than farther away markets.
- It is concluded that there is wide consensus that in hilly areas, we should emphasize on organic farming for the benefit of the farming community, consumers and the environment.

References

1. Agriculture Census (2020-21) All India Report on Number and Area of Operational Holdings. Agriculture census division Department of Agriculture & Co-operation Ministry of Agriculture, Government of India; c2020-21.
2. Aktar W, Sengupta D, Chowdhury. Impact of pesticides use in agriculture: their benefits and hazards. *Interdisc Toxicol.* 2009;2(1):1-12. DOI: 10.2478/v10102-009-0001-7.
3. APEDA. Agricultural and Processed food product Export Development Authority, Ministry of Commerce and Industries, GOI; c2022. www.apeda.gov.in.
4. Bahr AA, Gomaa AM. The integrated system of bio and organic fertilization for improving growth and yield of triticale. *Egypt. Appl. Sci.* 2002;17(10):512-523.
5. Balfour EB. The living soil and the haughley experiment. Faber and Faber. London; c1975. p. 383.
6. IPCC. "Summary for Policy Makers." In IPCC Fourth Assessment Report, "Working Group III Report: Mitigation of Climate Change". See specifically on agriculture, Chapter 8. Accessed February 12, 2009. <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf> and <http://www.ipcc.ch/ipccreports/ar4-wg3.htm>
7. Jagdish Chander Raina. Potential of Organic Farming in J & K. *Daily Excelsior, J & K;* c2021 November 28.
8. Lal R. Soil Carbon sequestration impacts on global climate change and food security. *Science.* 2004;304:1623-27.
9. Ministry of Agriculture and Farmer Welfare. Mission organic value chain development for North Eastern region A Sub-Mission under National Mission for Sustainable Agriculture (NMSA). Operational Guidelines. Accessed on 2017 September 14; c2016. <http://agricoop.nic.in/sites/default/files/OPG1922016.pdf>
10. Niggli U, Fliessbach A, Schmid H, Kasterine A. Organic Farming and Climate Change. Geneva: International Trade Center UNCTAD/WTO; c2008.
11. Reddy Suresh B. Organic Farming: Status, Issues and Prospects - A Review. *Agricultural Economics Research Review.* 2010;23:343-358.
12. Rodale R. The basic book of organic gardening. Ballantine. New York, NY; c1971. p. 377.
13. Sharma AK. Sustainability through simplicity: Rainwater conservation in the arid zone of India. *Indian Water Resources Quarterly.* 2000;48(1):5-10.
14. Sharma AK, Goyal RK. Addition in tradition: Agro-forestry in the arid zone in India. *LEISA India.* 2000;2(3):19-20.
15. Yadav AK. Organic Agriculture (Concept, Scenario, Principles and Practices). National Centre of Organic Farming, Department of Agriculture and Cooperation,

- Ministry of Agriculture, Govt of India, CGO-II, Kamla Nehru Nagar, Ghaziabad, 201 001, Uttar Pradesh; c2010. www.ncof.dacnet.nic.in.
16. Yepsen Jr. RB. Organic plant protection. Rodale Press. Emmaus, PA; c1976. p. 576. Wittwer and Haseman, 1945.
 17. Mayhew AJ, Amog K, Phillips S, Parise G, McNicholas PD, Souza DRJ, et al. The prevalence of sarcopenia in community-dwelling older adults, an exploration of differences between studies and within definitions: a systematic review and meta-analyses. *Age and ageing*. 2019 Jan 1;48(1):48-56.
 18. Jin Z, Teoh AB, Goi BM, Tay YH. Biometric cryptosystems: A new biometric key binding and its implementation for fingerprint minutiae-based representation. *Pattern Recognition*. 2016 Aug 1;56:50-62.
 19. Weibel FP, Bickel R, Leuthold S, Alföldi T. Are organically grown apples tastier and healthier? A comparative field study using conventional and alternative methods to measure fruit quality. In XXV International Horticultural Congress, Part 7: Quality of Horticultural Products 517; c1998 Aug 2. p. 417-426.