

The Tribune

VOICE OF THE PEOPLE

The Road to Sustainability

Organic farming is not just an alternative system of plant nutrition but a completely different paradigm, writes Rajinder Chaudhary

EVEN as the farm crisis remains in the news, the discourse is confined to issues like MSP, debt relief, floods, famine and the availability of chemical fertilisers. In the context of Haryana and Punjab, the lopsided crop mix is also highlighted, but the underlying technology is rarely questioned. Vandana Shiva's *The Violence of Green Revolution* remains an outlier. But of late, a significant minority has been looking critically at Green Revolution technology. Alternative farming methods are being promoted under different names — zero-budget farming, natural farming, biodynamic farming, permaculture etc.

All these emphasise different sets of practices and methods, but there are **two common, non-negotiable elements: non-usage of agro-chemicals — fertilisers, pesticides and weedicides — and non-usage of genetically modified (GM) seeds**. Organic farming is the widely used umbrella term that covers these methods of farming. However, two streams need to be segregated: a **narrow vision of organic farming** wherein it is almost similar to conventional farming, except for shunning the use of agro-chemicals; it involves usual mono-cropping as well as purchased external inputs. **The broader vision** has multiple points of divergence from conventional farming, the most important being self-reliance in inputs, which in turn leads to other differences. Often, these two versions of organic farming are clubbed. While this may be justified in some contexts, say in terms of nutritional composition of food, in other situations, for example farm economics or yield comparisons, this may not be justified and we will be better served by separating the versions.

With this caveat, organic farming can be evaluated from two vantage points. One can evaluate it from the perspective of a farmer as well as from a macro-economic or societal perspective. In the case of the farmer, except the one who is doing farming for self-consumption or as an add-on hobby — having made his money elsewhere, or for ideological reasons — profitability is the main consideration. Profitability can be assured even with reduced yield, provided the farmer gets higher prices. From the macro-economic perspective, taking food security into consideration, productivity cannot be ignored. **Besides yield, environmental and health benefits as well as sustainability are important**. For the farmer, the larger environmental benefits may not carry much weight. **Organic farming methods can become mainstream only if these look promising from the macro-economic vantage point; otherwise, it will remain niche farming, limited to certain sections**.

Research shows that organic food is healthier, while some studies claim that there are no such benefits. But **there is a test that anyone can do and check for oneself if organic food is better**. Take ('assured') organic grains as well as grains of the same variety but conventionally produced, and leave both as feed for birds. One needs to place the lots separately but nearby. Do this for a fortnight and you would notice that birds first feed on organic grains and only after these are finished do they move on to chemically grown grains. This exercise can also be done with stray dogs; put both organic roti and roti made of conventional wheat before the canines for a fortnight and you would notice that they first finish off the organic one. Even stray cattle

prefer an organic field for fodder as compared to the neighbouring conventional field (that is another headache for organic farmers). A report of the Indian Council of Agricultural Research (ICAR) says, "Quality parameters of different crops were higher under organic management compared to integrated and chemical."

Observation of response

Regarding yield, we can refer to the results of the Network Project on Organic Farming (NPOF) being run by ICAR-Indian Institute of Farming Systems Research, (IIFSR)-Modipuram (Uttar Pradesh) since 2004. As per the IIFSR, "Based on research studies in scientific organic management under ICAR-NPOF, 18 crops responded positively to yield on a par or higher under organic systems after the conversion period (2-3 years). Organic management of basmati rice, rice, maize, green gram, chickpea, soyabean, cotton, garlic, cauliflower and tomato resulted in yield advantage to the tune of 4% to 14% over inorganic management... Yield reduction (after eighth cycle across the locations) of 5-8% was observed in wheat, radish, potato etc." So, the NPOF results (for 2013-14), covering 20 centres in 16 states, show that rather than reducing production, organic farming can improve the yield. In fact, for some crops, the yield under organic farming was better than for the conventional type from day one. In Sikkim, before it started its journey towards organic farming, the productivity of rice was 1.43 tonne/hectare, but 11 years later, i.e. during 2013-14, it increased to 1.81 tonne/hectare. Interestingly, no yield reduction was observed during the conversion period. Productivity increase in other crops was also noted to the tune of 11%, 17% and 24% in maize, finger millet and buckwheat, respectively. These results should comfort those who are worried about food security of the country if a complete shift to organic farming takes place.

The NPOF results also note that "Continuous practice of raising the crops organically has good potential to sequester the carbon (up to 63% higher carbon stock in 10 years), higher soil organic carbon (22% increase in six years), reduction in energy requirement (by about 10-15%) and increase in water-holding capacity (by 15-20%), thereby promoting climate-resilient farming." This clearly indicates that organic farming is environmentally beneficial too.

And these results emerged with a 'narrow' view of organic farming. Not one centre conducted crop rotation experiments and only one reported results of mixed farming. All other experiments were single-variable experiments, which basically looked at organic farming as an alternative source of plant nutrition (along with no use of pesticides and weedicides) and compared it with inorganic and integrated sources of plant nutrition. Organic farming certainly implies non-usage of chemical fertilisers and chemical plant protection methods but it is not just that. Self-reliant organic farming involves much more than that; in addition to mixed cropping, crop rotation, residue recycling and composting, as recommended by NPOF, it also involves reduced irrigation, integration of animals and trees with field farming, seed treatment and mulching. All these are essential elements of (self-reliant) organic farming, as revealed by the performance of any successful organic farmer of some standing. Sailen Ghosh, an eminent scientist-promoter of organic farming, puts it thus: "Organic farming means farming in the spirit of organic relationship. When you say this, it opens up a whole vista. In nature, organic relationship is a pervasive phenomenon. Everything is connected with everything else. Hence, organic farming is not mere 'non-chemicalism' in agriculture. To be able to sustain this 'non-chemicalism', it has to get support from a host of other factors which are inseparably connected. Herein lies the essence of organicism."

Nourishing the soil

While chemical farming seeks to feed the plant, organic farming seeks to nourish the soil, taking care of nourishment of the plant as well. These nutritional strategies lead to different agronomic practices. If you are to externally feed and protect the plant, you have to go for mono-culture. Mixed cropping involving crops with different nutritional and plant protection requirements will not gel with chemical farming involving external feeding. The approach of

organic farming, if it is not to be heavily dependent on external inputs, is the opposite; it has to avoid mono-culture and go for mixed farming and crop rotation as these are required for nutritional and crop protection purposes. So, mixed farming and crop rotation are not optional but essential elements of the organic farming system or at least, self-reliant organic farming. Similarly, there has to be a change in the irrigation methods. In organic farming, soil biology is very important; for soil-microorganisms, heavy irrigation is an absolute no-no; microbes would be drowned. For conventional farming, soil biology is almost of no consequence as soil microbes are more or less dead. So, in organic farming, irrigation has to be minimal not only to save on water but also to get a higher yield.

Organic farming is not just an alternative system of plant nutrition but a completely different paradigm, involving a different set of agronomic practices. This is not reflected in experimental protocols and package of practices recommended by NPOF, except in a few recent cases. Experimental protocols make it clear that equivalent NPK (nitrogen, phosphorus and potassium) is provided through organic inputs. This is an unnecessary addition to the cost of organic farming. If there is biodiversity, we do not have to provide all nutrients externally. Soil microorganisms and companion crops will take care of some of it. Incidentally, this is evident in NPOF experiments too. It was observed that all crops registered a higher yield under reduced application of manures (75% nutrients only through organic manures with total organic management) compared to 100% nutrients' supply through organic manures. The yield increase was found to be 18%, 12%, 14%, 7.4% and 6% for cotton, maize, chilli, sunflower and beetroot, respectively, at Coimbatore. This means that when, rather than the full dose of nitrogen, only 75% of the requirement was supplied through the organic route, the yields were even better.

And this is just under mono-cropping conditions. Imagine the savings in input costs and yield increase if all elements of organic farming like mixed cropping, crop rotation, trees, improved composting etc. were to be practised. The entire farm economics would be different. Moreover, rather than crop-to-crop comparison between organic and conventional farming systems, the farm income/yield over a year at the least or, better still, over a crop rotation cycle should be compared. Recently, the NPOF has taken steps in this direction. Since 2013-14, it has started developing 'Integrated Organic Farming System models'. In the first year, these models evaluated at Coimbatore and Dharwad increased "the net income by two to seven times over the existing system". Actually, this experiment is the first real step towards undertaking a 'farming systems research'.

Profitable venture

Most organic farmers, at least to begin with, have a narrow vision of organic farming. They think that by discontinuing the use of agro-chemicals, they have adopted organic farming, even though they make no other change in the agronomic practices. Such farmers experience a sharp decline in the yield. But those who manage the transition to a broader view of organic farming and change the whole set of agronomic practices find that they are getting comparable yield, along with a decline in the cost of production and reduced risk of production. The transition to comparable yield in organic farming is dependent on the skills and inputs of the farmers. As regards profitability, if the number of organic farmers dependent on farming for a livelihood is steadily increasing and that too without systemic marketing support, and farmers are continuing into the third/fourth year and expanding the area under organic farming, it implies that they must be finding it profitable. Kudarti Kheti Abhiyan, a civil society initiative, has been promoting self-reliant organic farming in Haryana for the past about 10 years. It offers technical training with no marketing support. And even without marketing support, the number of farmers who have totally shifted to organic farming has been steadily increasing (and most of these are small farmers dependent on farming for survival). However, organic farming still has a long way to go.

Why go organic

- Organic farming provides more nutritious food, incorporating micro-nutrients, and so reduces reliance on food supplements. This, in turn, leads to better health and reduced sickness and morbidity.
- Can form the basis of rural regeneration as it can make farming self-reliant, and hence give a fillip to the local economy.
- Can provide increased and year-long employment in farming rather than offering concentrated seasonal work.
- Diversified & sustainable farming, not mono-cropping.
- Helps reduce air, water and soil pollution.
- Involves integration of farming and dairying rather than their spatial as well as institutional separation

Network project

- With the aim of developing a technological package of organic farming, including plant protection for various crops and cropping systems, the Network Project on Organic Farming (NPOF) was initiated in 2004-05 by the Indian Council of Agricultural Research (ICAR), with the Indian Institute for Farming Systems Research (IIFSR) as the nodal institute. In order to address the issues of comparison of organic, inorganic and integrated nutrient management practices, method & source of nutrient application, management of pests, diseases and weeds in crops/cropping systems, experiments were conducted at 13 centres.
- The experiments in the project have been designed mainly to evaluate the relative performance of location-specific cropping systems under organic and conventional (chemical) farming and assess the agronomic efficiency of production systems.

What govt can do

- Provide cheap and widespread testing facilities for residue and compositional analysis of food on the pattern of soil and water testing facilities
- Ensure cheap and easily accessible certification facilities for organic farmers
- Provide at least as much subsidy to organic farmers as is being availed by 'chemical' farmers

Objectives

- To study productivity, profitability, sustainability, quality and input-use-efficiencies of various crops and cropping systems under organic farming in different agro-ecological regions.
- To develop efficient crop and soil management options for organic farming.
- To develop need-based, cost-effective techniques for farm-waste recycling.

The author is Adviser, Kudarti Kheti Abhiyan, Haryana