
A Review on Proper Practice Implementation for Organic Wheat Crop Production

Varsha Deshraj*

Technical Assistant, Quality Inspector, Food Corporation of India, Bulandshahr,
Uttar Pradesh, India

Author for Correspondence: Email Id: varsha_nov1988@gmail.com

ABSTRACT

India's second-most important cereal crop, wheat, contributes significantly to the country's food and dietary security. Over the past few years, wheat has significantly contributed to the stability of the nation's food grain production. The world's demand for food is rising quickly along with the population. A significant portion of the world's food needs are met by the principal food crop known as wheat. Organic farming is an ecologically sound method of managing production that promotes and improves soil biological activity, biodiversity, and biological cycles. A minimum amount of off-farm inputs must be used, and management techniques that repair, maintain, and cultivate environmental harmony are essential. Growing wheat organically entails using sustainable techniques without the use of synthetic pesticides, growth regulators, preservatives, or typical commercial fertilisers. To maintain soil health, provide plant nutrients, and lessen insects, weeds, and disease, organic farmers use crop rotation, crop residues, legumes, animal manures, green manures, mineral-bearing rocks, off-farm wastes, mechanical cultivation, and biological pest management.

Keywords: Arid Region, Conventional System, Organic System, Sustainable Agriculture, Wheat Genotype. Ploughing and Planting.

INTRODUCTION

Just three crops, maize, wheat, and rice, provide more than 50% of the daily global requirement for proteins and calories (FAO, 1996), and just 150 crops are widely commercialized worldwide. On the other hand, ethnobotanic studies suggest that around 7,000 plant species are domesticated or gathered from the wild globally. The majority of the world's major cereal species are managed organically on at least 1.8 million hectares (including in-conversion areas). When compared to the FAO's estimate of 384 million hectares of harvested cereal land worldwide, organic management accounts for 0.5 percent of the total cereal land area. The most common crop in organic farming is *Triticum L.*, particularly bread wheat (*Triticum aestivum L.*), which is equivalent to conventional farming. It is raised using an organic system across a total surface area of about 700 000 ha [1].

Biodiversity, biological cycles, and soil biological activity are all promoted and improved through organic agriculture, an ecological production management method. It is relying on management techniques that improve, preserve, and restore environmental harmony as well as the limited usage of off-farm inputs [2]. Because it provides the most sources of protein and calories for people in the majority of countries, wheat is a crucial staple cereal on a global scale. Due to the accessibility of low-cost fertilisers, the use of chemical fertilizers in the production of cereals has increased globally. The prolonged use of chemical fertilizers results in risks to human health and the environment, such as nitrate leaching that pollutes surfaces and the ground.

The most difficult aspect of field management will therefore be lowering the amount of nitrogen fertilizers administered to a field without a nitrogen shortfall. Growing wheat organically entails using sustainable techniques without the use of synthetic pesticides, growth regulators, or regular commercial fertilizers. Crop rotation, animal manures, crop residues, legumes, green manures, mechanical cultivation, off-farm wastes, mineral-bearing rocks, and biological pest management are among the methods used by organic farmers to maintain soil health, provide plant nutrients, and reduce pests, weeds, and illnesses. A common definition of organic agriculture is a practice that forbids the use of genetically modified organisms, chemical pesticides, and synthetic fertilisers. As a result, crop breeding and agronomic research are increasingly focusing on identifying characteristics or features that, when used, can mimic the circumstances and outcomes of organic farming. Reproductive efficiency is frequently measured using the Harvest Index (HI). HI is an important measure in wheat that will quantify the yield in terms of the total amount of biomass. The size of the flag leaf is another crucial factor for wheat species. Wheat flag leaf photosynthesis has been determined to account for between 30 and 50 percent of the nutrients assimilated during grain filling. To ensure high output and great quality, organic farming systems that employ environmentally friendly agricultural techniques face a significant difficulty in maintaining chlorophyll content [3]. Numerous field tests comparing organic and conventional agricultural methods have revealed that the yield from organic methods is significantly lower. Barley (*Hordeum vulgare*), wheat, and a few other crops were used in a long-term study comparing organic and traditional agriculture in Sweden, and it was found that there was a discrepancy in crop production between the two farming systems. Wheat production must be viewed as a small part of a larger agriculture system. Continuous Wheat cropping and short crop rotations without a grazing phase are not likely to be acknowledged as organic agricultural practices that are able to last. Numerous field tests comparing organic and conventional agricultural methods have revealed that the yield from organic methods is significantly lower. Barley (*Hordeum vulgare*), wheat, and a few other crops were used in a long-term study comparing organic and traditional agriculture in Sweden, and it was found that there was a discrepancy in crop production between the two farming systems. Wheat production must be viewed as a small part of a larger agriculture system. Continuous Wheat cropping and short crop rotations without a grazing phase are not likely to be acknowledged as organic agricultural practices that are able to last.

MATERIAL AND METHOD

Choose a Good Quality and Proper Location for Wheat Farming-

Wheat production requires careful consideration of the location. The farmer must look for a location with fertile soil for growing wheat. The loam texture, good structure, and moderate water holding capacity of the soil are some characteristics that the farmer must accept in order to cultivate wheat.

Choose a Good Quality Variety

Different types of wheat require various types of soil. It's crucial to choose which type of wheat to grow after determining the proportion to plant. Winter wheat is sown in the fall and harvested from mid-May to late-July depending on location.

In the spring, spring wheat is sown, and it is harvested in the fall. Winter and spring wheat are further broken down into wheat, which is primarily used for crackers and pastries and lacks a high gluten content, durum, which has a high gluten level and is used for bread, and durum.

CLASSIFICATION [3]

- 1) **Indian Dwarf Wheat:** This wheat is a member of the Western Country Club Wheat. There are a few places in Pakistan, India's Uttar Pradesh, and Madhya Pradesh where you can find this. These are distinguished by having very few, thick heads with shorter grain.
- 2) **Macroni Wheat:** This kind of wheat is the best for areas that experience drought or have just a small amount of irrigation, such as Karnataka, Tamil Nadu, Punjab, Madhya Pradesh, West Bengal, Gujarat, and Himachal Pradesh. It is employed in the creation of semolina.
- 3) **Common Bread Wheat** - Punjab, Uttar Pradesh, Bihar, and Rajasthan are alluvial soil states on the Indo-Gangetic plains that are known for their bread wheat.
- 4) **Emmer Wheat:** Tamil Nadu, Karnataka, and Maharashtra were discovered to grow this variety. It is also grown in Spain, Russia, Germany, and Italy.
- 5) **Triticum aestivum:** This variety is currently grown in India in nearly all wheat-growing regions. It is mostly used for making bread.

PREPARATION OF ORGANIC SOIL FOR WHEAT FARMING

Before beginning to grow wheat, the soil needs to be properly prepared. To accomplish this, plough the earth with a disc or a moldboard plough. The soil should next be prepared by making one deep plough, two to three light ploughs, and planking. Afterward, incorporate organic fertilisers. A typical acre of land requires 50 kilogramme of nitrogen, 25 kg of phosphorus, and 12 kg of potash for commercial wheat farming. While getting the soil ready, more organic materials must be applied.

Soil Fertility – A high-yielding wheat crop is extremely dependent on the pH level of the soil. Poor growth and development could be caused by low soil pH. Manganese shortages may be caused by high soil pH values, especially in soils with a coarse texture. Although organic wheat is a heavier feeder than corn, it is still not as heavy. An ecologically acceptable nitrogen source (such manure, compost, or a tilled-in legume) should be added at or before planting and once more in the spring for the optimum yield outcomes. An acre of wheat that yields 65 bushels will require about 70 pounds of nitrogen [4].

Organic management seeks to maximize the contributions of on-farm resources like composts, animal manures, and green manures to soil fertility. Though purchased off-farm nutrients including mineral fertilizers, fortified composts, and plant and animal meals could also be necessary to make sure adequate nutrient availability during the transition to an organic program.

Building soil organic matter enhances nutrient availability, also as soil moisture-holding capacity, and may aid in preventing the buildup of soil-borne plant diseases. a crucial a part of an organic soil-building program is that the rotation of crops, including the utilization of canopy crops and green manures [5].

Seed Quality in Organic Wheat Farming

Utilizing good quality Wheat seed for planting is that the foundation for obtaining excellent germination and stand establishment. Highest quality seed is faithful variety, freed from other crop seeds, weeds, disease, foreign material, and has plump, dense kernels of high germination. Seed quality is one among many factors that affect forage production and grain yield and may be vital when planting in poor conditions, like dry soils, deep planting, or late

planting. Growers may influence forage and grain yields with decisions concerning the standard of seed that's to be planted [6].

The Seed Rate and Spacing in Organic Wheat Farming

The seed rate may have to be increased for organic production to make sure good early coverage. Organically grown wheat can show evidence of a bit slower early growth rates evaluate to conventionally grown Wheat. When planting on time with high-quality seed into conventionally tilled seedbeds, the target seeding rate is 30 to 35 seeds per sq ft. For irrigated, suitable sown wheat, a row spacing of 15 to 22.5 cm is followed. Under irrigated late-sown conditions, the simplest row spacing is between 15 to 18 cm. For dwarf wheat variety, the planting depth must be between 5-6 cm. Planting beyond this depth leads to a poor stand. Within the case of conventional tall varieties, the depth of sowing could also be either 8cm or 9 cm [7].

Wheat Planting Procedure

Wheat seeds must be planted in the soil at a depth of 4-5 cm. Always arrange the seeds in rows, with 20–22.5 cm between each row. It's also crucial to plant or sow the seeds at the proper time, as delayed planting can result in a progressive drop in yield. It is typically sown in our nation between the end of October and the beginning of November. Before planting, the wheat seeds are also properly sorted and meticulously cleaned. A fungicide can then be used by the farmer to treat the seeds [8].

Weed Management in Organic Wheat Farming

Weed control in organic wheat must be accomplished in seed bed preparation before planting. Slight to no cultivation is employed in Wheat after planting to kill emerging weeds, but a rotary hoe or tine weeder are often used before the crop emerges and again at the one-to-three-leaf stage. Though, weeds usually cause fewer problems in Wheat than in corn or soybeans because Wheat may be a strong competitor against weeds and is drilled in narrow rows that quickly shade the soil [9].

Management of Organic Pests and Diseases

Being a plant, pests and diseases have always been a drag, although, with the utilization of pest and disease-resistant varieties and pesticides, the yield has increased phenomenally. Some common pests that affect the Wheat cultivation are Stripe Rust or Yellow Rust, mildew, Aphids, Head Scabs, Army Worm, Termites, etc. Most of them are often taken care of with some added vigil and judicious use of pesticides. Armyworms infest small grains, usually wheat, from late April to mid-May. They will cause serious defoliation, injury to the flag leaf, and head drop. Small cultural management choices are available for armyworms. Organic growers have the selection of using an insecticide approved for organic production or accepting the feeding of armyworms in emergencies [10].

Wheat varieties known to be immune to pest or disease problems are a clear first choice as a preventative measure. The susceptibility or resistance of various Wheat varieties is usually documented when grown under conventional farming systems, but their performance has not been well studied under organic farming systems. The effect of soil conditions on plant growth is taken into account an important think about plant susceptibility or resilience to pest and disease attack. Poor plant growth or imbalanced growth (due to soil conditions) can make plants less resilient and more vulnerable to pest and disease attack [10]. Also, soil with good biological activity can provide a level of biological control over soil-borne pests or disease.

Major diseases affecting Wheat crop are mildew, smut, stem rust, foliar blights, and bunts. Care must be taken as follows:

- 1) Timely sowing cycle must be follow.
- 2) Seeds will be solar treated before sowing
- 3) Resistant varieties must be used.
- 4) Digging up the affected plant and burning it

Harvesting Time and Procedure of Wheat

The Wheat plant can be harvested after it reaches the conclusion of the growing process, which means it is sufficiently dried and no green is visible. The wheat crop is harvested when the grains are tough and long-lasting, and the straw is dried out, brittle, and golden in colour. The plants are manually harvested by using a sickle in the early morning. Harvested plants are carried to the piling area in bundles that have been knotted [11].

Crop harvesting begins as soon as the leaves and stems turn yellow and start to feel a little dry. Always keep in mind that in order to maximize output, the wheat crop must be harvested before it is completely ripe. Therefore, timely harvesting is crucial for lasting quality as well as for maximising Wheat yield. The wheat is ready to be harvested when its internal moisture content reaches between 25 and 30 percent. The wheat crop can be harvested, threshed, and winnowed all at once using a combine harvester, which is available on the market [11].

RESULT AND DISCUSSION

Bread wheat (*Triticum aestivum* L.) is that the most vital market cereal species. As organic farming has undergone a big development and it's still unevenly found out in various countries, there's a deficiency of suitable varieties for the sustainable farming systems. High costs for breeding, weak and uneven representation of the organic farming are the most reasons of such a state. The choice of an appropriate place may be a significant a part of Wheat farming in consideration with Soil's loam texture, good structure, and moderate water holding capacity. Decision to pick proper wheat variety is very practical base.

The soil must be prepared properly before starting Wheat farming by ploughing and adding natural fertilizers. Organic management seeks to maximize the contributions of on-farm resources like composts, animal manures, and green manures to soil fertility. Almost any modern bred sorts of bread wheat which are conventionally grown aren't suitable for organic farming. Different selective criteria from those applied to the choice of sorts for organic farming are among the most reasons. *E.g.* less efficient rootage, low competitiveness to weeds, low resistance to usual diseases or reduced baking quality provoked by a discount of the proportion of nitrogen within the soil. Utilizing good quality Wheat seed for planting is that the foundation for obtaining excellent germination and stand establishment. Highest quality seed is faithful variety, freed from other crop seeds, weeds, disease, foreign material, and has plump, dense kernels of high germination.

Seed quality is one among many factors that affect forage production and grain yield and may be vital when planting in poor conditions, like dry soils, deep planting, or late planting. The seed rate may have to be increased for organic production to make sure good early coverage. Organically grown wheat can show evidence of fairly slower early growth rates compared to traditionally grown wheat crop. Wheat seeds must be sown in about 4-5 cm deep inside the soil. All the time place the seeds in rows and continue a spacing of 20-22.5 cm between the

rows. All kinds of weed control in organic Wheat must be achieved in seedbed preparation before planting. Wheat varieties known to be immune to pest or disease problems are a clear first choice as a preventative measure.

Being a plant, pests and diseases have always been a drag, although, with the utilization of pest and disease-resistant varieties and pesticides, the yield has increased phenomenally. When the Wheat plant reaches its end within the growing procedure, meaning it's dry enough and no green is showing, it's able to be harvested. Proper timing for harvesting is additionally essential factor to preventing the loss and to extend the yield.

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