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Conversion from conventional to organic farming – A review

Venkatesan V G[1], N Indianraj[2], Mummadi Thrivikram Reddy[1], N Naveen[1]
[1] Department of Soil Science and Agricultural Chemistry, Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal, U.T of Pudhucherry, India
[2] Department of Agronomy, Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal, U.T of Pudhucherry, India

Abstract
Organic farming is a system, which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives *etc*.) and to the maximum extent feasible relies upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection. (USDA, 2002) [23]. Today, the intensive demands of conventional agriculture and the subsequent environmental impact are leading many people to demand production systems that are less detrimental to their health and the environment. Some of these detrimental effects are soil erosion and degradation, nonpoint source water pollution, groundwater contamination, reliance on nonrenewable energy sources, Stalinization, aquifer depletion, and loss of biological diversity. Conversion period refers to the lapse of time between the start of the organic management and the certification of crops and/or animal husbandry as organic. Soil suitability may vary significantly from one field to the next. Many tools exist to assess soils. Soil chemical, physical and biological analyses, soil survey and legume composition field assessments, and field yield histories are very important and should be considered early in the transition.

Keywords: Organic farming, practices, bio-herbicide, soil fertility, and good quality

Introduction

The USDA implemented national organic standards in October of 2002, in response to the increased demand for organic products. These standards, known as the Final Rule, help define organic production. Organic farming is a system, which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives *etc*) and to the maximum extent feasible relies upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection (USDA, 2002) [23]. The trend toward organic production is also a result of consumers' concerns about possible negative impacts on their health when they are exposed to foods that contain chemicals. For these reasons, organic production is making a comeback. Farming organically allows producers to incur many economic and social advantages compared to farming conventionally (Chase *et al*., 2019) [5]. Organic farming aims at cultivating the land and crops raising in such a way, as to keep the soil alive and in good health. Converting land to organic status is a three-year process. First year produce grown cannot be stated as organic. In the second year produce may be named as "In Conversion". It is not until the third year that produce may be stated as fully 'organic'. India has lot of potential to produce all varieties of organic products due to its various agro climatic conditions. As per the available statistics, India's rank second in terms of World's Organic Agricultural land and first in terms of total number of producers. As on 31st March 2024 total area under organic certification process is 7.3 million ha (2023-24). This includes 44,75,836.91 ha cultivable area and another 28,50,156.48 ha for wild harvest collection. Among all the states, Madhya Pradesh has covered largest area under organic certification. India produced around 3.6 Million Metric Tons (2023-24) of certified organic products. The total volume of export during 2023-24 was 2,61,029 MT. Organic production is governed by UK and EU legislation. About 30% of global crop production and global food supply is provided by small land holdings, less than 2 hectares, using around 25% of agricultural land, and in a way that usually maintains rich agro-biodiversity. Agriculture based on the principles of organic farming can be a transition pathway to the solutions needed for sustainable food systems and climate resilience, Delate *et al*. (2013) [9] concluded that a well managed organic system held an economic advantage over the conventional.

The conversion Phase

The duration of time that passes between the beginning of organic management and the certification of crops and/or animal husbandry as organic is known as the conversion period. Growers are required to implement approved cultural, chemical, and biological techniques throughout the transition phase, and the farm will be under the certification body's (CB) supervision. Filling out the "Notice of Organic Production" form and submitting it to the appropriate government and certification organization are the usual first steps. The first farm inspection is completed by the inspector following registration, and they also determine the terms of the conversion time. Though there is typically no market, products might be labeled as "in conversion to Organic Agriculture" throughout the conversion process. This conversion phase, which typically lasts two years, gives the producer and the soil time to get used to the organic practices. Regarding artificial fertilizers, pesticides, chemicals, and animal welfare, the business must abide by all Organic Standards during the conversion phase. It is recommended that farmers who are serious about converting to an organic production system start a pre-transition period,

by slowly eliminating conventional practices such as using pesticides and beginning organic practices such as using biological control (Ngouajio *et al*. 2003) [16]. Split farming operations that simultaneously grow crops organically and conventionally are allowed in Iowa but require special conditions (Delate, 2003) [10]. After the required conversion period expires, the inspection body may issue organic status to the farmer (unless conversion period is being extended), which allows the farmer to sell produce as organic. However beneficial changes observed in the soils, including better soil aeration and rooting depth, better ability of the soil to hold water, and less potential for soil erosion and compaction (Sellen *et al*. 1995) [18].

Basic Steps of Organic Farming

Organic farming approach involves following five principles that includes, Conversion of land from conventional management to organic management, Management of the entire surrounding system to ensure biodiversity and sustainability of the system, Crop production with the use of alternative sources of nutrients such as crop rotation, residue management, organic manures and biological inputs, management of weeds and pests by better management practices, physical and cultural means and by biological control system and maintenance of livestock in tandem with organic concept and make them an integral part of the entire system. Organic producers must use a longer crop rotation than conventional counterparts. Also, the same row crop cannot be produced in consecutive years on the same field.

Conversion planning

A conversion plan should include: an appraisal of the farm, its resources and objectives, plan of the farm system: soil and manure management, crop rotation, livestock type, numbers and management, a review of the labour requirements, infrastructure and equipment needs and a marketing plan, financial budgeting for the conversion period and for the established organic farm, conversion timescale, which will be at least 2 years in a single step conversion, or may be over several years with a larger or more complex farm where a staged conversion will give time to address technical issues and spread the investment costs. Before conversion officially starts it is need to apply for any organic grant schemes available, along with inspection by one of the organic certification bodies, Conversion is necessarily site specific.

Organic Production: The Basics

While turning towards organic it is essential that the basic requirements of the system and the area are properly understood and long term strategies are addressed first. To start with, following parameters need to be addressed in first stage includes: Enrichment of soil, Management of temperature, Conservation of rain water, Maximum harvesting of sun energy, Self reliance in inputs, Maintenance of natural cycles and life forms, Integration of animals and Maximum reliance on renewable energy sources, such as solar power and animal power.

Soil Fertility: The foundation of organic farming lies in the health of the soil. A fertile soil provides essential nutrients to a growing crop plant, and helps support a diverse and active biotic community. Strategies the transitional farmer will employ to build the soil are crop rotations, animal and green manures, and cover cropping.

1. Crop rotation

Don Kretschmann - "Rotation is the practice of using the natural biological and physical properties of crops to benefit the growth, health, and competitive advantage of other crops. The desired result is a farm which is more productive and to a greater extent self-reliant in resources". This refers to growing of number of crops one after the other in a fixed rotation to maintain the fertility of the soil. Legumes should be used frequently in rotation with cereal and vegetable crops. Green manure crops should also find place in planning rotations. Some important benefits of crop rotations are: soil structure is improved through different types of roots, Pest build up is avoided and rotations help against the build up of weeds. The following steps are adapted from crop rotations on organic farms (Mohler and Johnson, 2009) [15]: 1. identify and prioritize your goals for the crop rotation 2. list your crop mix 3. check for excessive acreage in one family 4. identify crop couplets and short sequences that work on your farm (including cover crops), 5. make a crop-rotation planning map, noting which beds or fields (or parts of fields) are problem areas that might affect certain crops.

Fig 1: At Rodale Institute's Farming Systems Trial, soybeans are part of a complex crop rotation that includes corn, wheat, oats, and other small grains.

2. Cover crops

Cover crops are crops grown to improve the farming system. Cover crops are typically planted between rotations of income-producing crops, but they can also be planted at the same time. Cover crops fulfill a wide variety of management objectives and serve as integral components of organic farming systems (Treadwell *et al*. [2008]) [22]. A cover crop should: satisfy the producer's primary reasons for cover cropping, be easy to establish and maintain with available equipment, be well-suited to the local climate and the farm environment, not compete with income-generating crops grown simultaneously or subsequently, and have the ability to withstand stress. An all-legume cover crop may break down too rapidly, releasing a large pulse of N that may leach to groundwater or stimulate weed growth (Heilig and Hill, 2014; Teasdale, 2012) [12, 20], However, finding the right mixture for one's local region and production system can be challenging (Barbercheck *et al.*, 2014) [3]. Cover crops and compost or other organic soil amendments work together to enhance soil health and

fertility (Delate *et al*., 2015; Hooks *et al*., 2015; Tavantzis *et al*., 2012).

Fig 2: A biculture of black oats and crimson clover are drilled in alternating rows as a green manure cover crop for sweet corn. Photo credit: Corey Cherr, University of Florida.

3. Green manures

Green manure refers to the practice of growing and incorporating specific crops into the soil for their beneficial qualities. These crops, known as cover crops or green manures, are grown primarily to improve soil fertility, prevent erosion, suppress weeds, and support overall crop health in organic farming systems. Green manures can be cultivated in various forms, such as legumes (e.g., clover, peas), grasses (e.g., rye, oats), or a combination of both. When a green plant is incorporated into the soil, it contains high amounts of nitrogen and moisture and becomes a food source for soil microorganisms and earthworms. During the process of decomposition by the organisms in the soil, organic matter and nutrients become available to the crop plants. Additional benefits from using green manures include the suppression of weeds and soilborne diseases, this helps replenish nutrient levels and promote healthy plant growth, improve soil fertility and structure**,** increase nutrient availability for plants and enhance water retention capacity of the soil**.**

Crotalaria juncea *Sesbania rostrata*

Fig 3: Green manure crops

4. Animal manures

Animal manures are considered a cornerstone in organic farming due to their multifaceted benefits. They are not just waste products but valuable resources that can significantly enhance soil health and fertility. soil fertility enhancement-animal manures are rich in essential nutrients such as nitrogen, phosphorus, and potassium, which are crucial for plant growth. They provide a slow-release form of nutrients, which is beneficial for sustainable crop production. Improvement of Soil Structure- the organic matter present in manures improves soil structure by increasing soil aggregation. Enhancement of soil microbial activity, reduction of soil erosion and increasing water infiltration. It is best to use compost manure, since the heat created during composting may kill most of the contaminants. The droppings of sheep and goats contain higher nutrients than farmyard manure and compost. On an average, the manure contains 3 per cent N, 1 per cent P_2O_5 and 2 per cent K_2O.Poultry manure contains higher nitrogen and phosphorus compared to other bulky organic manures. The average nutrient content is 3.03 per cent N; 2.63 per cent P_2O_5 and 1.4 per cent K_2O. On an average well decomposed farmyard manure contains 0.5 per cent N, 0.2 per cent P_2O_5 and 0.5 per cent K_2O.

5. Weed management

Weed management is the key aspect of organic farming system. The farmers have always faced huge loss due to the presence of weeds in their fields. Weeds are the most common threats to agricultural production. The term “weed” is defined as an unwanted plant species that counter with the crops in a particular field at a particular time. Weed management in organic farming has evolved in such way that application of many strategies and invention of new technologies leads to achieve economically desirable weed control and higher yield of crops (Davies *et al*., 2005 and 2006 and Davies and Turner, 2004) [6, 7, 8]. The chief aim of sustainable weed management is to reduce the potential hazards of weeds on crops. The weeds have to control during this critical period so that the weeds that arise later will not affect much the yield.

5.1. Cultural practices for weed control:

a. Crop rotation

Crop rotation plays a central role in organic farming due to contributions to soil fertility, soil conservation, and suppression of certain insect pests and pathogens. Crop rotation also has long been recognized as fundamental to weed management [Martin, J. H., and Leighty, C. E. (1938).] [14]. For many organic growers, weed management considerations play a central role in determining rotation length and crop sequence (Bond and Grundy, 2001) [4]. Diversification of crop characteristics within a rotation helps to disrupt weed life cycles and prevent any one species from becoming too “comfortable” within the cropping system, Mohler, C. L. (2001).

b. Cover crops

Cover cropping involves the use of actively growing non harvested crops and their residues to increase soil productivity, suppress diseases and insect pests, and manage weeds Depending on plant architecture, phenology, residue quality, and residue management, cover crops provide different weed management benefits (Teasdale, 1996; Gallandt *et al*., 1999) [11, 21]. Green manures, cover crops that are grown solely for incorporation into soil to improve soil quality (Pieters, 1927) [17].

c. Intercropping

Intercropping involves cultivation of two or more crops at the same time on the same field. Intercrops are capable of controlling weeds. The application of intercropping as an approach for weed control should be done carefully. The intercrops can prominently lessen the harvests of the main crop if competition for nutrients and water takes place.

d. Mulching

Mulching or covering the surface of soil can inhibit weed seed germination by obstructing light transmission halting seed germination. Allelopathic chemicals in the mulch also can tangibly prevent seedling occurrence. There are many types of mulches obtainable. Living mulch: living mulch is a species that sprouts thickly and minimal to the ground like clover. Organic mulches: materials like bark, straw and composted material can provide efficient weed control and this cultural weed management practices include variety selection, tillage system, planting patterns etc.

5.2. Mechanical practices for weed control

Mechanical elimination of weeds is both labor demanding and time consuming, but is extremely efficient strategies for controlling weeds. The soil seed bank is the stock of weed seeds exists in the soil. Detecting the configuration of the seedbank can assist an organic grower take practical weed management choices. Burial to 1 cm deepness and cutting at the soil surface are the most efficient strategies to manage weed seedlings mechanically. Mechanical weeders consist of harvesting tools such as harrows, tines, hoes and brush weeders, cutting tools like stimmers and mowers and dual-function tools like thistle-bars. The ideal timing for mechanical weed management is guided by the competitiveness of the crop and the developmental stage of the weeds. Hand weeding can also be applied after mechanical inter-row weeding to counter with weeds existed in the crop row.

a. Flamers

Using fire to control weeds in organic farming systems shows promise for reducing weed populations without herbicides. A carefully directed flame fueled by natural gas or liquid propane (LP) increases the temperature within the weed, causing cells to rupture and effectively killing weeds while doing little damage to the crop. Flaming disrupts weed growth through heat, so it is important to flame when the plants are dry and wind speed and direction are favorable. Both moisture and wind can lower the heat from the flame, reducing the effectiveness of the flaming application. Weeds are most susceptible to flame heat when they are 1 to 2 inches tall or in the three- to five-leaf stage. Broadleaf weeds are more susceptible to flaming than grasses such as foxtail.

Fig 4: Organic corn that has been flamed for weed control. Flaming kills weeds while doing little damage to the crop.

b. Soil solarization

Organic growers fumigate their soil by solarization process during summer. A distinct plastic film is set over an area after it has been dug and compactly coated at the edges. Solarization works when the heat wrecked under the plastic film turns strong enough to destroy weed seeds. The process of soil solarization works through several mechanisms: Thermal inactivation- High temperatures can directly kill or inhibit the growth of many weed seeds and pathogens, Moisture conservation- The plastic covering helps retain soil moisture, which is critical for enhancing the thermal death of pests, Changes in soil chemistry- solarization can also lead to changes in soil chemistry that are unfavorable to some pathogens and weeds and Stimulation of beneficial organisms- some beneficial soil microorganisms thrive at higher temperatures and can outcompete or antagonize soilborne pests.

Fig 5: Soil solarization in organic farming

c. Freezing

Freezing would be useful if there is an apparent fire risk from flaming. Application of liquid nitrogen and solid carbon dioxide can be done for freezing weeds. Different testing techniques using microwaves, electrocution and irradiation have also been assessed for weed control, but slow working rates, high energy inputs and the safety measures for operators have obstructed further developments. Lasers have been displayed to reduce the growth the *Eichornia crasispes* (water hyacinth) but did not destroy the weed entirely. Application of UV light for weed control has been patented but rests at an experimental stage.

5.3. Biological practices for weed control

Living organisms *viz*., insects, disease organisms, herbivorous fish, snails or even competitive plants for the management of weeds are called biological methods not

useful to control all types of weeds. Introduced weeds are best targets. There are four methods of biological weed control: classical – using a non-native organism (usually an insect) that is released in areas infested with the targeted weed and the biocontrol organism feeds on the weed and reduces the weed population over time, inundative – rearing an organism in a controlled setting then releasing it at high numbers to control native or invasive weeds, conservation – manipulating a cropping system to increase the populations of natural weed suppressing organisms and grazing – using large herbivores such as cattle or sheep to reduce weed populations.

a. Allelopathy

Allelopathy has the direct or indirect chemical impact of a plant on the germination and development of adjoining plants. It is generally referred as an element of biological weed suppression. Both crops and weeds species show this capability. Allelopathic crops consists of barley, rye, buckwheat, oats, sorghum, alfalfa, sunflower, wheat and red clover. Vegetables like radish and carrot extract specific strong allelopathic chemicals from their roots. Reports have been suggested that allelochemicals and other natural products and their derivatives could make the core of bioherbicides.

b. Biological Weed Control by Insects

Lantana camara a prickly shrub is controlled effectively by Larvae of *Crocidosema lantana*, the tortricid moth and Larvae of *Agromyza lantanae*. *Eupatorium odenophorum* in Hawaii and Australia - a gallfly *Procecidochares utilis*. *Leptospermum scoparium*- mealybug *Eriococcus orariensis*.

Fig 6: Field releases of *Z. bicolorata* were initiated in 1984 which established readily under field conditions of Parthenium in Bangalore.

c. Biological Weed Control by Pathogens

Water hyacinth (*Eichhornia crassipes*) – *Cercospora rodmanii* this pathogen is pathogenic only to water hyacinth. *Fusarium roseum* 'culmorum' is pathogenic to *Hydrilla verticillata*. There is also substantial investigation attempt focused at genetically engineering fungi (myco-herbicides) and bacteria so that they are more efficient at managing particular weeds.

5.4. Chemical control

Chemicals that destroy or inhibit plants by affecting their physiological processes are called herbicides. A few numbers of herbicides are organically adequate. These consists of contact stuffs like acetic acid, citric acid and sodium nitrate solutions. Corn gluten is a preemergent stuff that is used to the soil to control weeds as they tend to germinate. Now-a-days, the efficiency of these organically preferable herbicides is fringe at top.

Table 1: Commercial myco-herbicides

Trade name	Pathogen	Target weed
Devine	*Phyophthora palmivora*	*Morreria odorata* (Strangler vine) in citrus
Collego	*Colletotrichum gleosporoides f.sp. aeschynomene*	*Aeschynomene virginica* (northen joint vetch) in rice and soyabean
Biopolaris	*Biopolaris sorghicola*	*Sorghum halepense* (Johnson grass)
Biolophos	*Streptomyces hygroscopius*	General vegetation(non-specific)
LUBAO 11	*Colletotrichum gleosporoides f.sp. Cuscuttae*	*Cuscutta sp.* (Dodder)

6. Pest management

As in organic farming management use of synthetic chemicals are prohibited. These include microbial insecticides such as *Beauveria bassiana* (a fungus that attacks a wide range of both mature and immature insects), soaps that interfere with an insect's ability to respire, pheromones used as bait for traps and as disruptors of mating cycles, and botanical plant extracts such as neem that interfere with an insect's metabolic processes.

6.1. Cultural or agronomic

Use of disease free seed or stock and resistant varieties are best preventive practice in organic pest management. Effective crop rotation, multiple cropping, habitat manipulation and use of trap crops are also effective practices which can keep the population of pests below economical threshold limit (ETL).

6.2. Mechanical

Removal of affected plants and plant parts, collection & destruction of egg masses and larvae, installation of bird perches, light traps, sticky colored plates and pheromone traps are most effective mechanical methods of pest control.

6.3. Biological

Use of pest predators and pathogens has also proved to be effective method of keeping pest problem below ETL. Ecological balance is maintained through the use of beneficial insects, predatory or parasitic mites, and spiders to keep pest populations down. To attract beneficial populations, farmers manipulate the farm scape by growing hedges and planting flowers.

Steps to a Successful Organic Transition

It requires numerous changes. One of the biggest changes is in the mindset of the farmer. Conventional approaches often involve the use of quick-fix remedies that, unfortunately, rarely address the cause of the problem. Transitioning farmers generally spend too much time worrying about replacing synthetic input with allowable organic product instead of considering management practices based on preventative strategies. Here few steps new entrants should follow when making the transition to organic farming:

a. Understand the basics of organic agriculture and the organic farming standards

Organic production systems are knowledge based, new entrants and transitional producers must become familiar with sound and sustainable agricultural practices. Transitional producers should be prepared to read appropriate information, conduct their own trials and participate in formal and informal training events. Switching from conventional to organic farming is more than substituting synthetic materials to organic allowed materials. Organic farming is a holistic system that relies on sound practices focused on preventative strategies. The analysis of the farm must include : farm characteristics: size, plots and crops distribution, which kind of crops, trees, animals are integrated in the farm system, soil Analysis: an evaluation of the soil structure, nutrient levels, organic matter content, erosion level, and/or the soil have been contaminated, climate: rainfall distribution and quantity, temperatures, frost risks, humidity, organic matter sources and management (manures), presence of animal housing systems and/or machinery and Limiting factors such as capital, labor, market access, among others.

b. Identify resources that will help you

Existing organic farmers are generally very helpful in sharing valuable technical information. A good mentor should be able to provide transitional producers with knowledge, practical experience and suggest appropriate reading materials. Mentors are able to identify some of the most important challenges transitional farmers will be confronted with. Producers should also contact agrologists, veterinarians and other agricultural and financial consultants. The Internet is a valuable source of information, especially to new organic farmer.

Fig 7: Get information.

c. Plan your transition carefully

Develop a transitional plan with clear and realistic goals. The plan should clearly identify various steps to be taken in making the transition to organic and be sure to include realistic timeframes. Identify your strengths and weaknesses. The business side of the transitional plan should contain a multiple year budget and an effective/realistic marketing strategy. Although the demand for organic products is continually growing, growers need to make sure they have a reliable market for the organic products they plan to produce. During the early part of the transitional period, yields are often depressed and premium prices for certified organic products are generally not yet obtainable.

d. Understand your soils and ways to improve them

Since soil is the heart of the organic farming system, it is crucial that new entrants understand the various characteristics and limitations of the soils found on their farm. Soil chemical, physical and biological analyses, soil survey and legume composition field assessments, and field yield histories are very important and should be considered early in the transition. If farmers plan to grow crops without raising any livestock, it may be necessary for them to source allowable soil amendments such as composted manure, limestone, rock dust, and supplementary sources of nitrogen, phosphorus, potassium and micro-nutrients.

e. Identify the crops or livestock suited for your situation

Before growing a crop or raising any livestock, consider the following: degree of difficulty to grow or raise the product organically, land and soil suitability, climate suitability, level of demand for the product, marketing challenges, capital required, current prices for conventional, transitional and organic products, and profitability over additional workload.

f. Design good crop rotations

Once the crops are chosen, carefully plan the crop rotations and select the most suitable cover crops. Crop rotations are extremely important management tools in organic farming. They can interrupt pest life cycles, suppress weeds, provide and recycle fertility, and improve soil structure and tilth and also income. The transitional plan should, therefore, include crop rotation strategies.

g. Identify pest challenges and methods of control

It is important to know the crop's most common pests, their life cycles and adequate control measures. There are several measures available to reduce pest pressure: crop rotation, variety selection, sanitation, floating row covers, catch crops, flamers, introduction of beneficial insects and bio pesticides. When considering a new type of production, discuss pest issues with your agrologists, IPM specialists and/or other existing organic producers to optimize your chances of success.

h. Be ready to conduct your own on-farm trials

Successful organic farmers continuously try new and/or innovative management practices. Practices such as cover cropping, inter-planting, and use of various soil and pest control materials need to be evaluated regularly by organic farmers.

i. Be ready to keep good records:

Record keeping is one of the most important requirements to maintain organic integrity. Farmers are expected to keep detailed production, processing and marketing information. Third party, independent inspectors require farmers to present the above mentioned documentation when inspecting the farm operations.

j. Avoid these common mistakes

Underestimating the need for good transitional and marketing plans. Underestimating the need to fully understand the Organic Standards in order to know what is permitted and prohibited. Transitional farmers should

consider improving their crop rotation, soil and crop management skills, livestock management practices.

The Organic Standards

A major factor distinguishing organic farming from other approaches to sustainable farming is the existence of internationally acknowledged standards and certification procedures. These standards have been developed to provide organic producers with consistent, clear rules as to how organic food should be produced. Some of the main requirements are listed below: fertilizers and chemicals-soluble mineral fertilizers are prohibited, but some such as lime and phosphate are permitted. Clover and other legumes supply nitrogen. The balance between fertility building crops, such as grass and exploitative crops such as cereals and potatoes is critical in a tillage rotation. Animal welfare-The highest standards of animal welfare are obligatory. Bedding, good ventilation and generous floor space are required for housed animals. Ruminant stock must be fed a diet which is at least 60% roughage.

Conclusion

Organic farming aims at cultivating the land and crops raising in such a way, as to keep the soil alive and in good health conditions by use of wastes that are organic such as (crop, animal and farm wastes, aquatic wastes) and other biological materials along with beneficial micro organisms (biofertilizers and biopesticides) to grow and protect the crops for increased sustainable production in an ecologically friendly and pollution free environment. During the transition period, growers must use cultural, chemical, and biological practices that are approved under the Final Rule. While turning towards organic it is essential that the basic requirements of the system and the area are properly understood and long term strategies are addressed first. Organic farming is a holistic system that relies on sound practices focused on preventative strategies. Soil is the heart of the organic farming system, it is crucial that new entrants understand the various characteristics and limitations of the soils found on their farm. Soil suitability may vary significantly from one field to the next. Many tools exist to assess soils. Soil chemical, physical and biological analyses, soil survey and legume composition field assessments, and field yield histories are very important and should be considered early in the transition.

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