IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Organic Horticulture Techniques For Eco-Friendly Sustainable

[1]Soumya Sulagna Padhan, [2]Shantanu Bhattacharyya, [3]Pratibha Rani Deep

[1,2,3]School of Applied Sciences,

[1,2,3]Centurion University of Technology and Management, Odisha, India

Abstract: Taking care of the environment is very important today, and sustainable farmingis key for our planet's health. Organic horticulture, which uses natural farming methods, is leading this effort. "Organic Horticulture Techniques for Eco-Friendly Agriculture" is an easy-to-understand guide on these practices. It explains how we can farm in ways that protect the environment and ensure a healthy future. Organic horticulture focuses on natural ways to control pests, enrich soil, and rotate crops, working with nature rather than against it. By using these methods, farmers reduce their impact on the environment and support biodiversity and soil health. Traditional farming, which relies on manual labor and natural resources, also supports sustainability. Combining old and new methods can boost environmental benefits. Organic farming avoids synthetic chemicals and uses natural methods to improve soil and control pests, keeping soil healthy and promoting biodiversity while ensuring fair treatment of workers. Balancing organic and chemical fertilizers can help with sustainable crop production. With India's growing population, sustainable farming is crucial for saving resources and supporting biodiversity. Organic farming improves soil health, reduces pesticide use, and supports ecosystems by following nature's way. Its main goals are to increase biodiversity, maintain soil health, and create a sustainable farming system.

Keywords – Organic farming, composting, biofertilizer

I. INTRODUCTION:

In today's world, where taking care of the environment is more important than ever, sustainable agriculture is not just a passing fad; it's a must for our planet's health. Organic horticulture, which focuses on natural methods of farming, is leading the way in this movement.'Organic Horticulture Techniques for Eco-Friendly Agriculture' is a complete handbook that explains these practices in easy-to-understand language. It shows how we can farm in a way that not only protects the environment but also ensures a healthy future for generations to come." Organic Horticulture Techniques for Eco-Friendly Agriculture" is like a guidebook forfarmers who want to farm in a way that's good for the Earth. It's all about inviting people to bepart of a group of farmers who care about the environment. We're exploring different ways to grow plants that are healthy for both us and the planet. So, let's start this journey by learning how to farm in a way that's not only good for our harvests but also good for nature.

Organic horticulture represents a comprehensive approach to farming that prioritizes environmental consciousness. It seeks to revolutionize traditional farming methods by emphasizing sustainable practices that work in harmony with nature rather than against it. This approach encompasses a wide range of techniques, including natural pest control, soil enrichment through organic matter, and crop rotation to maintain soil fertility. By adopting organic horticulture practices, farmers aim to minimize their impact on the environment while simultaneously promoting biodiversity, soil health, and the overall well-being of ecosystems. In essence, organic horticulture is about reimagining agriculture as a symbiotic relationship between humans and the natural world, where cultivation is not only about yield but also

aboutnurturing and preserving the Earth's resources for future generations (Raut et al. 2024). Traditional agriculture, which is often environmentally friendly and sustainable, involves integrated farming systems. It relies on methods passed down through generations, emphasizing manual labour, basic tools, and natural resources. It encompasses diverse practicessuch as subsistence farming, organic methods, seasonal planting, traditional irrigation, livestock rearing, and local knowledge. Since ancient times, farmers have passed down traditional farming methods through generations, evolving from shifting cultivation to permanent farming. They continue to integrate practices like farming near forests, using livestock waste for soil enrichment, and clearing land by burning wood for ash fertilizer. These methods are rooted in inherited environmental knowledge and experience. When we use a holistic approach to farming, each part of the farm helps improve the others.

By combining traditional methods with new, renewable technologies, we can create environmentally friendly agriculture. This means that everything on the farm, from planting crops to raising animals, works together to make things better for the environment (Kariada et al. 2023). Some people criticize organic farming because it often relies on previously applied phosphorus (P) and potassium (K) fertilizers before transitioning to organic methods. The challenge scientists face is how to feed the growing population with organic food while ensuring food security, reducing poverty, and conserving natural resources. Organic farming is a method of growing crops or raising livestock that steers clear of synthetic substances like fertilizers, pesticides, and growth enhancers. Instead, it relies on natural methods to nurture the soil, control pests, and promote growth. This means not only producing food in a way that protects the environment and conserves natural resources but also prioritizing fair treatment of workers and ensuring profitability for farmers. Organic farming is essentially about creating a system that benefits both people and the planet, now and for future generations. Balancing organic and inorganic nutrient sources is key to reducing reliance solely on chemical fertilizers for sustainable crop production.

By minimizing nutrient loss and maximizing efficiency, combining organic amendments with chemical fertilizers can promote both sustainable agriculture and a healthierenvironment. Switching from modern, chemical-heavy farming to more sustainable methods like organic farming seems like a good choice for ensuring continued agricultural productivityin the future. Adding organic matter to soil boosts its content and availability of essential nutrients like nitrogen (N), phosphorus (P), potassium (K), and sulphur (S) **(**Ashraf et al. 2016). Growing crops using organic farming means they're grown without pesticides, herbicides, or synthetic fertilizers. India's population, expected to reach 1.3 billion by 2020, is growing at a rate of 1.8 percent annually. At this pace, the country will require an additional two million tonnes of cereal grains each year to meet the rising demand (Geetanjly et al. 2015).

Sustainable horticulture is crucial to counteract the overuse of natural resources, prevent habitatloss and water scarcity, and mitigate pollution from pesticides and contaminants. Organic farming, a cornerstone of sustainable horticulture, promotes biodiversity, preserves soil fertility, and minimizes pesticide residues by reducing reliance on synthetic pesticides and prioritizing soil health **(**Zaller et al. 2019). "Sustainable" means a farming system can last for along time without running out of resources or causing harm to the environment. Integrated Pest Management (IPM) combines crop rotation, biological control agents, and monitoring techniques with other pest control methods to minimize chemical pesticide use and harm to non-target organisms (Gontijo et al. 2019). Boosting biodiversity is crucial for sustainable horticulture. It enhances natural pest control, supports pollination, and strengthens ecosystem resilience by improving agricultural systems, preserving habitats, and nurturing beneficial species (Kumar et al. 2023).

In simple terms, organic farming is about the relationship between soil, plants, animals, and people. It follows certain principles like promoting biodiversity, using natural methods to control pests, and avoiding synthetic chemicals to nurture healthy food and ecosystems.

1.1. *The important objectives of organic farming are:*

1. Ensuring that the farm obtains sufficient produce or crops to fulfil theirneeds or expectations
2. Making sure the farming techniques align with the cycles and rhythmsof nature is the solution.
3. Increasing the fertility of the soil and health over time.
4. Preserving and growing agricultural and sustainable variety.
5. Create a complete, renewable, secure, and economical cultivatingsystem.
6. Fulfilling and receiving the advantages of tradition and wisdom.

II. Sustainable horticulture practices:

1.*Eco- friendly farming*

Eco-friendly farming is all about teaming up with nature to grow good food, stay healthy, and maintain the health of the land. It's like recognizing that every piece of nature's puzzle fits together perfectly, and by respecting that, we can create a win-win situation where everyone thrives. Eco-friendly farming is like stepping back and lettingnature do its thing. It means farming without disturbing the soil and steering clear of synthetic chemicals such as pesticides, fertilizers, and herbicides. Instead, it trusts in nature's own processes to nurture crops and keep the soil healthy. Eco-friendly farming is all about cutting back on outside stuff that can harm the soil. It means using fewer synthetic fertilizers, pesticides, and herbicides, which can mess up the natural balance of the land. Instead, it focuses on methods like composting and crop rotation to keep the soil healthy and happy. Eco-friendly farming minimizes external inputs, promotes soil fertility through beneficial microbes, and encourages symbiosis between soil floraand crops.

Mulching keeps soil moist, protects earthworms, and stops weeds by blocking sunlight. It's a great way to boost soil health and reduce the need for chemicalsin farming (SR et al. 2016). Organic farming keeps soil healthy by breaking down plant leftovers and naturally managing pesky bugs. It says no to chemical fertilizers, pesticides, and other harmful stuff, relying on methods like crop rotation and cover cropping for better food and soil. Eco-friendly farming adds more organic material to the soil, making it better at holding water, allowing air to circulate properly, and becoming less compact, which helps prevent soil erosion. Organic food and products are often pricier due to their perceived health and environmental benefits. This premiumpricing helps organic farmers earn more, boosting their economic strength compared toconventional farmers. In wealthy countries, people see organic food as safer and healthier because it has fewer pesticide residues. This demand reflects a growing concern for food safety and health among consumers(Kumar et al., 2022).

2. Organic farming in horticulture

Organic farming, according to the USDA, avoids synthetic inputs and relies on natural methods like crop rotation, animal manures, and biological systems to sustain soil health, protect crops, and prioritize sustainability. Organic horticulture keeps soil, ecosystems, and people healthy. It uses natural processes, biodiversity, and local conditions instead of harmful inputs. By blending tradition, innovation, and science, organic farming protects the environment, fosters fairness, and improves quality of life for everyone involved. Organic farming offers solutions to many modern agricultural and food production challenges. It's based on principles of health, ecology, fairness, and care. Organic products are nutrient-rich and mostly free from pesticide residues and additives. Organic livestock farming avoids antibiotics and other drugs, helping to combat the rise of antibiotic-resistant bacteria. Organic farmers promote biodiversity, which helps control pests naturally. They also improve soil, water, air, and wildlife, and support pollinators for a healthier environment and better food production. Organic products have lower pesticide and nitrate levels.

Organic farming is rapidly expanding, covering 1% of global agricultural land. It utilizes organic fertilizers like compost and green manure, and employs techniques such as crop rotation and companion planting. Sustainable development in horticulture is increasingly pursued, primarily through "organic" horticulture practices. Organic farming is often considered more sustainable than conventional methods, but it also has its challenges and advantages. One of its strengths is that it's less polluting in terms of environmental and climate impacts. In horticulture, organic farming typically results in lower yields compared to conventional methods. As more farmers transition to organic practices, the yield gap may widen dueto the higher level of expertise required. Scaling up organic horticulture could also leadto habitat loss and higher prices. While relying solely on organic farming may not be the optimal long-term solution for food security in horticulture, a balanced approach that incorporates both organic and conventional practices could help increase global agricultural output (Gamage et al., 2023) .

III. SOIL HEALTH MANAGEMENT IN HORTICULTURE:

Soil health refers to the soil's ability to sustain life and support productivity while also preserving the environment and promoting the health of plants, animals, and humans. Soil quality focuses on whether a specific soil is suitable for a particular purpose, while soil health considers the broader functions of soil and emphasizes its dynamic, living nature. Essentially, soil quality is like a targeted assessment for a specific job, while soil health is a holistic evaluation of soil's overall well-being and role in the

ecosystem. To enhance soil health, focus on managing organic matter, minimizing disturbances, diversifying soil biota, maintaining living plants, and keeping the soil covered whenever feasible (Larkin et al., 2015). Improving soil health helps fight plant diseases in several ways. When we take care of the soil, it becomes a tougher environment for harmful germs to thrive. This happens because good soil practices encourage helpful microorganisms, make plants stronger, and disrupt the life cycle of diseases. So, by looking after the soil, we're also protecting our plants from getting sick. General diseasesuppression occurs when the microbial community in soil grows and becomes more active, which competes with soilborne pathogens, reducing their ability to cause diseases, even if their populations don't decrease. soil health" covers all the important jobs soil does, like storing carbon, recycling nutrients, managing water, and supporting diverse life. Soil health is a big idea, and it's tricky to measure and understand (Norris and Congreves 2018)

3.1. COMPOSTING:

Compost is dark brown, smells earthy, and is made from breaking down organic stuff with air.Compost happens when tiny living things break down organic stuff, turning it into different kinds of useful dirt. Compost makes soil better by adding lots of good stuff to it. Regularly using compost can enhance nearly every aspect of crop production. It enriches the soil with essential nutrients, promotes healthier root systems, improves soil structure and water retention, enhances microbial activity, suppresses plant diseases, and ultimately leads to higher yields and better quality crops (Paulin et al., 2005).

Compost provides nutrients and helps healthy growth in vegetable and fruit crops by improving the soil. It also plays an important part in container mixes, providing a balanced substrate that is essential for the growth of potted plants. Composting is getting more popular because it's safer than just dumping trash in a landfill, which can pollute water and air. Composting turns waste into something useful for making soil better. When compost is made right, it's great for gardening. More and more people are using compost because it's cheap and provides nutrients for plants. It also makes soil better and can be used in soilless mixes. Using compost a lot can even help soil fight off diseases (Raviv et al., 2015).

3.2. GREEN MANURING:

Growing with the goal of changing them into organic matter for soil improvements, green manuring requires particular crops. While still fresh and green, these crops are produced and then cultivated into the ground. Nutrient addition, improved soil structure, and generally soil health are all improved by this method. for crops in the future. Improving soil fertility through natural means is a continuous technique. Green manure crops are more effective to cover crops in terms of improving soil health parameters and reducing diseases from soil because they have higher fresh matter content and have a significant effect on soil microbiology, which has been appears to inhibit pathogens in other crops in the past. Green manuring increase soil fertility, structure, and causes substantial improvements in soil organisms in comparison to conventional crop rotation or cover crops. It also produced extra organic matter inputs. Like other organic matter additions such as manure or sawdust, green manures change microbial communities in a unique way while improving microbial biomass and activity (Larkin et al., 2015).

3.3. MULCHING:

Mulching helps soil by keeping it moist, controlling temperature, stopping weeds, preventing erosion, making soil better for plants, and keeping pests and diseases away. Growing grain crops and healthy orchard trees with a mix of veggies, weeds, and white clover on the ground helps keep the soil healthy. Putting straw on top helps keep the soil moist and makes it a good place for tiny bugs and worms to live and help the plants grow. Putting mulch on the soil can help seeds grow without digging it up. Plants like white clover help stop weeds from growing. Plants like legumes add nitrogen to the soil, which helps other plants grow. Removing weeds before they make seeds and covering bare soil helps soil stay healthy without needing chemicals to kill weeds (SR et al., 2016).

Mulching slows down water flow on the ground by making the soil bumpy and catches water and dirt. Mulching is either organic or inorganic, depending on their materials are used. Organic mulch makes soil better by adding nutrients and moisture, and it keeps the soil warmer while reducing water loss. Soil organic matter is like the boss of soil fertility in many places. Adding organic mulch makes soil better in every way—it improves how the soil feels, its chemical makeup, and even the tiny living things in it. Inorganic materials like plastic, rubber, carpet, soil, rocks, and gravel can be used for mulching. Soil

mulch is often used in poor countries where people have limited money for farming (Ngosong et al., 2019).

3.4. BIOFERTILIZERS

Biofertilizers are tiny living things that turn nutrients into a form plant can use. They're cheap,don't need much energy to make, make plants grow better, and keep soil healthy. They also fight off plant diseases. Horticultural crops require eco-friendly technology to boost production efficiency and ensure nutritional food security, fostering a sustainable agricultural production system. Using biofertilizers is like using natural boosters for plants that not only save money but also help the environment by reducing the need for chemical fertilizers. This makes the soil healthier and improves the overall quality of farmland. Fruit crops, prioritized over vegetables and ornamentals, benefit from Azotobacter biofertilizers. Organically grown fruits and vegetables fetch higher market value domestically and internationally, with fewer agrochemicalresidues, positively impacting human health (Pathak et al., 2017).

Biofertilizers economically reduce external inputs while enhancing ecological sustainability, improving both the quality and quantity of natural land resources (SINDHU et al., 2010) . Organic agriculture integrates tradition, innovation, and science to enhance the environment and foster equitable relationships, promoting a good quality of life. Utilizing organic manures like vermicompost, forest litter, and biofertilizers such as Azotobacter and phosphate-solubilizing bacteria cuts cultivation costs while enriching crops with secondary andmicronutrients. Bio-fertilizers and organic manure boost plant growth by increasing root biomass and surface area, improving nutrient absorption and yield while reducing reliance on natural energy sources. Their application across various crops has shown potential to enhance biomass and productivity (Prasad et al., 2016).

3.5. PEST AND DISEASE MANAGEMENT:

In organic farming, preventing pests and diseases is prioritized through eco-friendly methods,aiming to maintain ecosystem health and enhance plant resistance, rather than relying on treatments after the fact. Plant extracts, along with conventional fungicides and microbial biocontrol agents, have proven effective against various pathogens. Studies have shown that neem leaf and fruit extracts directly affect target pests and pathogens. To prevent pollution andpreserve medicinal plant properties, natural plant products are used instead of chemicals to control disease. Pest and disease management strategies in organic farming categorized for easy understanding and effective application are :-Modify cultural practices, employ conservation methods, use biological control agents, apply botanicals, deploy pheromones, and use organic pesticides (Haldhar et al., 2017) .

Loss of soil organic matter degrades soil structure and quality, leading to root diseases. Soil fumigation can worsen this by creating a biologically poor environment that favors rapid growth of plant pathogens reintroduced into the soil. High nitrogen concentrationsand plant nutrient imbalances increase susceptibility to root and foliar pathogens. In organic farming, controlling pests and diseases largely relies on maintaining soil fertility through balanced crop rotations, including nitrogen-fixing crops, cover crops, intercrops, adding manure and compost, and minimizing soil tillage. In organic farming, crop protection focuses on creating an environment where plants can naturally resist potential pathogens, often using cultural methods (Bruggen et al., 2015).

Horticultural productionemploys three pest control methods: conventional chemicals, integrated pest management (IPM), and organic pest control. Chemical companies have sometimes led in developing biological control agents and are increasingly embracing integrated pest management (IPM) principles. Integrated control combines selective chemicals with various biological and physical controls, while organic producers utilize naturally occurring chemicals and many IPM-developed biological methods. Pest control in horticulture needs to be eco-friendly in three main ways: Protect the environment beyond the crops , preserve land for long-term use, including restoring natural habitats , use sustainable options like biological control instead of non-renewable energy sources (Wearing et al., 1994). IPM is a way to manage pestsby balancing methods like natural enemies, pesticides, and cultural practices. Its goal is to reduce economic damage and environmental harm by controlling pest populations instead of wiping them out. In Japan, organic crop production in humid, warm climates poses pest and disease challenges, especially for greenhouse growers. Permanent cropping systems like appleorchards or closed greenhouses hinder crop rotation and biodiversity establishment (Xu et al.,2008).

3.6. WATER MANAGEMENT:

In organic farming, because fewer chemicals like nitrogen and phosphorus are used compared to conventional farming, there's less water pollution. This means we can reuse water more easily. In organic farming, when we save and reuse nutrients on the farm, it keeps the water clean and prevents pollution. Planting cover crops and rotating crops helps keep the soil healthy, lets water soak in better, and reduces the amount of nutrients washing away and soil erosion. To stop nitrate pollution in groundwater, we can check how fast nitrogen breaks down in the soil and use certain plants to absorb excess nitrogen (Parizad and Bera et al., 2021).

Using smart ways to water crops better can save water and money, while also being kinder to the environment. Sometimes, experts give farmers helpful advice on how to do this, so they can use irrigation systems more effectively and get more out of their crops. farmers might not know how well they're using water, so they might not try to improve. Using less water doesn't always mean reducing how much water is used, but rather making better use of it. This can help farmers make more money and protect the environment. Even though experts have created different ways to measure this, farmers aren't using them much yet (Levidow et al., 2014). To keep up with the growing demand for food, we have to use irrigation water management (IWM). This means we need to get better at using water to grow crops. Sometimes, a lot of water is needed to irrigate fields, which means there's less water available for other agricultural needs. Irrigation system is really important everywhere, especially in places where water is scarce, to find better ways to manage irrigation water. This can help crops grow better without using too much water. To manage irrigation water better and reduce losses like runoff and evaporation, techniques like deficit irrigation, locally-made drip systems, pitcher irrigation, and surface mulching can be used (Asres et al., 2023).

Greywater is the water that comes from your bath, shower, handwashing, laundry, and kitchen sink. It's not as clean as drinking water. Greywater is often a lot and not very dirty, while blackwater is not as much but is dirtier. The reuses of greywater may include irrigation around homes, golf courses, parks and other open spaces, groundwater recharge and industrial evaporative cooling. Using greywater for watering plants can change the microbes around the roots that break down soaps, and it can also affect how much water plants release through transpiration. continuously using greywater on garden beds can lead to an increase in the soil's alkalinity. This means the soil becomes more basic or less acidic (Pinto et al., 2010).

IV. SUSTAINABLE HARVESTING AND POST- HARVEST HANDLING:

Woese and Smith Spangler discovered that the two method of production had similar qualitative characteristics after evaluating major but not statistically significant variances in quality comparing organic and conventionally-managed crops. But over this past ten years, additional research has contributed to improving the sets of data used in the present research. A high quantity of secondary metabolites—such as vitamins and phenols, which do not contain nitrogen was in connection with a low amount of nitrogen forms. Multiple investigations have shown a greater amount of secondary metabolites in organic tomatoes, sweet peppers, and carrots. On tomatoes and carrots, some research studies found the opposite outcomes. The multiple post-harvest performance of the products may be identified through the different kinds and amounts of secondary metabolites occurring at harvest, that can influence antioxidant changes during the cold storage period. Few research comparisons have addressed post-harvest refers to of such kind, despite the issue’s value. Improvements in the appearance of physiological illness, soluble solids content, durability, and mineral content during cold storage have been observed (Ceglie F et al.,2016). Organic products must be stored under particular conditions that depend on the type of fruit or vegetable in order to preserve its freshness after harvesting. The sustainability of quality is heavily affected by variables related to time, temperature, humidity, and ethylene sensitivity. A controlled environment may be required to preserve certain fruits and vegetables in order to maintain their freshness. According to the unavailability of effective organic pre- and post-harvest management methods, disorders and decay make up the primary risk to quality loss in organic fruits and vegetables during storage (Prange et al.,2010).

V. Future Prospects:

Integration of modern technology is the most important things in the future prospective of the organic horticulture techniques. For generating the information at different level to be used in resource planning and contributing to sustainable agricultural production, remote sensing monitoring in organic farming essential. The turning point in the agriculture isthe use of remote sensing method, GPS technology and hyperspectral image analysis, that helping the famers to switch to agro-environmental and organic farming (Chanev and Filchev, 2023). For the improvement of scale and productivity we can use fully automated drone that can help us. In the organic horticulture for soil analysis in field planning, seed pod planting, crop monitoring, crop spraying, irrigation, crop health assessment, crop surveillance, controlling of weed, controlling of insect, controlling of pest controlling of disease, crop biomass estimation and scaring bird the automated drone can be used (Pathak et al.,2020). Internet of Things (IOT) help in advances of sensor technology, data storage, connectivity, data analytic, algorithms for decision making and prediction and in the process of irrigation, for optimal fertilizers and pesticide dispersion (Postolache et al., 2022).

Common technologies in organic horticulture in urban to maintain soil fertility and produce high quality product are (i) using compost; (ii) applying appropriate rotation programs;
(iii) using physical, mechanical and biological mechanism to control pest and (iv) applying organic method in the feed and livestock production (Lorenz, 2015). Organic horticulture in the protected environment is the produce high productivity and yielding of the crop. Here the plant growth is done properly and the quality of the product is improved so the crop that is cultivated in the control environment of organic horticulture have high demand and value (Dorais and Cull, 2016).

Developing plants in soil-less condition having their root inundated in nutrient arrangement is known as soil-less culture. As compared to open field ordinary soil condition the higher yielding can be obtain by soilless culture in organic horticulture; here put forward opportunities to provide most favourable condition for the plant growth. For the control of pests and soil borne disease soilless culture is the best alternative (Gautam et al., 2020). Crop growth in mineral solution, with no soil medium for the root is known as hydroponics. By the processof hydroponic in the organic horticulture techniques we can grow more yield and best quality of the product (Kumari et al., 2018).

VI. CONCLUSION:

Sustainable agriculture needs to provide enough nutritious food, reduce environmental harm, and ensure farmers earn well. Rapid changes are needed to meet global goals. The main approaches are improving conventional farming gradually or restructuring with agro-ecological methods. Combining organic farming with enhanced techniques like bio fertilizers, and digital tools can solve organic farming challenges, boost productivity, and improve farmers' lives in an eco-friendly way. Organic farming yields nutritious and safe food. With a rise in health- conscious consumers, organic food is gaining popularity. It ensures food safety from farm to plate and is more eco-friendly than conventional farming, preserving soil health and the environment. The organic food market is booming globally, including in India. Organic farming boosts health, protects the environment, and supports the economy by creating income. India is the world's largest organic producer. Promoting organic farming can lead to a healthier nation in terms of nutrition, ecology, and economy. Sustainable farms avoid harmful pesticides and practices, making food safer and protecting people from toxins. Integrated Pest Management (IPM) reduces costs and improves quality using bio-fertilizers, while conserving farm biodiversity. Sustainable farms do not use harmful pesticides or practices, making food safer for everyone and protecting people from dangerous chemicals. They also use a method called Integrated Pest Management (IPM), which helps reduce farming costs and improves the quality of crops by using natural fertilizers and pesticides. This approach also helps protect the environment by preserving the variety of plants and animals on the farm.

Acknowledgment
We are thankful to Centurion University of Technology and Management for providing the opportunity to carry out this piece of review work.

REFERENCES:

[1] Mitra, S., & Devi, H. (2016). Organic horticulture in India. Horticulturae, 2(4), 17.

[2] Ouma, G., & Jeruto, P. (2010). Sustainable horticultural crop production through intercropping: The case of fruits and vegetable crops: A review. Agriculture and Biology Journalof North America, 1(5), 1098-1105.

[3] Brzozowski, L., & Mazourek, M. (2018). A sustainable agricultural future relies on the transition to organic agroecological pest management. Sustainability, 10(6), 2023.

[4] Kumar, M., Kaushik, K., Singh, S., Kumar, S., Rai, A., Kumar, R., … & Kumar, A. (2023). Sustainable horticulture practices: An environmental-friendly approaches.

[5] Kallas, Z., Serra, T., & Gil Roig, J. M. (2009). Farmer's objectives as determinant factors of organic farming adoption. In 113th EAAE seminar: a resilient European food industry and food chain in a challenging world.

[6] Larkin, R. P. (2015). Soil health paradigms and implications for disease management. Annual Review of Phytopathology, 53(1), 199-221.

[7] Prange, R. K. (2010, August). Pre-harvest, harvest and post-harvest strategies for organic production of fruits and vegetables. In XXVIII International Horticultural Congress on Science and Horticulture for People (IHC2010): International Symposium on 933 (pp. 43-50).

[8] Gamage, A., Gangahagedara, R., Gamage, J., Jayasinghe, N., Kodikara, N., Suraweera, P., & Merah, O. (2023). Role of organic farming for achieving sustainability in agriculture. Farming System, 1(1), 100005.

[9] Paulin, R., & O'Malley, P. (2008). Compost production and use in horticulture. Government ofWestern Australia: Department of Agriculture and Food.

[10] Devarinti, S. R. (2016). Natural farming: eco-friendly and sustainable. Agrotechnology, 5(2), 1000147.

[11] Ngosong, C., Okolle, J. N., & Tening, A. S. (2019). Mulching: A sustainable option to improve soil health. Soil fertility management for sustainable development, 231-249.

[12] Pathak, D. V., Kumar, M., & Rani, K. (2017). Biofertilizer application in horticultural crops. Microorganisms for Green Revolution: Volume 1: Microbes for Sustainable Crop Production, 215-227.

[13] Sindhu, S. S., Nisha Verma, N. V., Seema Dua, S. D., & Deepika Chaudhary, D. C. (2010). Biofertilizer application for growth stimulation of horticultural crops.

[14] Prasad, H., Sajwan, P., Kumari, M., & Solanki, S. P. S. (2017). Effect of organic manures and biofertilizer on plant growth, yield and quality of horticultural crop: A review. Int. J. Chem. Stud, 5(1), 217-221.

[15] Hardhat, S. M., Jat, G. C., Deshwal, H. L., Gora, J. S., & Singh, D. (2017). Insect pest and disease management in organic farming. Book 'Towards Organic Agriculture'edited by B. Gangwar and NK Jat. Today & Tomorrow's Publishers, New Delhi, Page, 359-390.

[16] Van Bruggen, A. H., Gamliel, A., & Finckh, M. R. (2016). Plant disease management in organic farming systems. Pest Management Science, 72(1), 30-44.

[17] Wearing, C. H. (1994, May). Integrated or organic pest management for horticulture: Do we have to choose. In Proc. NZ Entomological Society Symposium on Sustainable Land Management, May 1994 (pp. 20-32).

[18] Xu, H. L., Xu, R., Qin, F., Ma, G., Yu, Y., & Shah, S. K. (2008). Biological pest and disease control in greenhouse vegetable production. Acta horticulturae, 767, 229-238.

[19] Pinto, U., Maheshwari, B. L., & Grewal, H. S. (2010). Effects of greywater irrigation on plant growth, water use and soil properties. Resources, Conservation and Recycling, 54(7), 429-435.

[20] Parizad, S., & Bera, S. (2023). The effect of organic farming on water reusability, sustainable ecosystem, and food toxicity. Environmental Science and Pollution Research, 30(28), 71665-71676.Chanev, M., & Filchev, L. (2023). Review of the Applications of Satellite Remote Sensing in Organic Farming (Part I). Aerospace Research in Bulgaria., 35, 183-191.

[21] Pathak, H., Kumar, G., Mohapatra, S. D., Gaikwad, B. B., & Rane, J. (2020). Use of drones in agriculture: Potentials, Problems and Policy Needs. ICAR-National Institute of Abiotic Stress Management, 300, 4-15.

[22] Postolache, S., Sebastião, P., Viegas, V., Postolache, O., & Cercas, F. (2022). IoT-based systems for soil nutrients assessment in horticulture. Sensors, 23(1), 403.

[23] Lorenz, K. (2015). Organic urban agriculture. Soil Science, 180(4/5), 146-153.

[24] Dorais, M., & Cull, A. (2016, April). Organic protected horticulture in the world. In III International Symposium on Organic Greenhouse Horticulture 1164 (pp. 9-22).

[25] Gautam, R., Singh, P. K., Kumar, P., Selvakumar, R., Singh, M. C., Dhital, S., … & Kumar, J. (2021). Advances in soilless cultivation technology of horticultural crops. The Indian Journal of Agricultural Sciences, 91(4), 503-508.

[26] Kumari, S., Pradhan, P., Yadav, R., & Kumar, S. (2018). Hydroponic techniques: A soilless cultivation in agriculture. Journal of pharmacognosy and phytochemistry, 7(1S), 1886-1891.