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e-CROPTODAY
ELECTRONIC CROP
Agriculture Meets Innovation

A Way to a Sustainable Future





PRECISION GROW

PIONEERING THE FUTURE FARMING

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As I stand in the heartland of our nation, surrounded by fields that have nurtured generations, I feel a deep-rooted connection to the land. It's a connection that binds us to our past, sustains us in the present, and promises a future brimming with possibilities. However, the challenges that loom large over our agricultural landscape cannot be ignored. Climate change, resource depletion, and the growing global population cast a long shadow on the very foundation of our food security. It is imperative that we shift our focus towards sustainable practices to ensure the continuity of this vital sector.

Sustainability is not merely a buzzword; it's a moral imperative. It's about nurturing the land while ensuring it remains productive for future generations. It's about optimizing resource utilization without compromising the environment. It's about building resilient agricultural systems that can withstand the vagaries of climate change. And most importantly, it's about empowering our farmers with the knowledge and tools to thrive in this new era of agriculture.

Technology, once a distant dream for many of our farmers, is now a powerful ally. It's transforming the way we cultivate, harvest, and market our produce. Precision agriculture, with its ability to optimize resource use through data-driven insights, is revolutionizing the industry. Drones monitor crop health, soil sensors provide real-time feedback, and weather forecasting helps farmers make informed decisions. These advancements not only boost productivity but also minimize our environmental footprint.

I applaud the government's efforts to foster a conducive environment for technological adoption in agriculture. Initiatives aimed at digital literacy, infrastructure development, and research funding are steps in the right direction. However, we need to do more. There is a pressing need for targeted programs that address the specific challenges faced by small and marginal farmers. Digital divide remains a significant hurdle, and bridging this gap is crucial for inclusive growth.

Moreover, the government must play a proactive role in promoting sustainable practices. Incentivizing organic farming, supporting agroforestry, and investing in research on climate-resilient crops are essential steps. Additionally, policies that promote sustainable consumption patterns and reduce food wastage can have a profound impact.

But sustainability is not solely the responsibility of the government or large corporations. It's a collective endeavor that requires the active participation of every stakeholder, from farmers to consumers. We must embrace sustainable practices at every level, from adopting eco-friendly farming methods to reducing food waste in our homes.

As farmers, we have a unique opportunity to lead the charge towards a sustainable future. By adopting innovative technologies, embracing sustainable practices, and sharing our knowledge with the next generation, we can ensure the long-term health of our farms and the well-being of our communities.

The path ahead is undoubtedly challenging, but it is also filled with immense promise. By working together, we can build an agricultural system that is not only productive and profitable but also environmentally responsible and socially equitable. Let us harness the power of technology, the wisdom of our ancestors, and the spirit of innovation to create a sustainable future for generations to come.

The fate of our planet, and the well-being of billions, rests on our ability to cultivate a harmonious relationship with the land. Let us rise to the challenge and become stewards of a sustainable agricultural future.

2024

We Should Be Taught About Sustainable Practices in School

New EU Rules Seen to Restrict Exports of Textiles, Footwear

Sustainability Sector to Boost Job Creation

India Encounters Substantial Challenges in the Agriculture Sector

Understanding the Components of Soil: An Overview of Soil Profile

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ICAR CTCRI Celebrates 61st Foundation Day in the Presence of the Hon'ble Governor of Kerala

Warming Is Getting Worse. So, They Just Tested a Way to Deflect the Sun

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We Should Be Taught About Sustainable Practices in School



The scorching heat is a prominent reminder that climate change is drastically altering our planet as global temperatures reach all-time highs. Amidst this, people worldwide are questioning why they were not educated about the impact of greenhouse gases and the importance of sustainable practices. Children today are inheriting a world burdened by overindulgent and ignorant decisions that have led to our current, worrying conditions. This article explores the actions necessary to educate the coming generation about sustainability, the implications of this education, and how we can act to ensure a brighter future.

Why We Need to Educate About Sustainability

Education plays a pivotal role in shaping the mindset of future generations as we strive to manage technological advancements and their environmental impacts. Had we understood the adverse effects of mishandling our relationship with the environment, we would have emphasized the importance of educating young people about sustainability. Proper knowledge from an early age would instill environmental sensitivity and awareness that human actions must be regulated to avoid dire consequences.

The Importance of Education for Sustainable Development (ESD)

Education for Sustainable Development (ESD) aims to equip everyone with the knowledge, skills, attitudes, and values needed for a sustainable future. ESD integrates crucial topics like climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption into teaching and learning.

Interactive Teaching Methods

ESD uses interactive teaching methods that inspire and empower learners to change their behavior and take action for sustainability. envisioning future scenarios, and collaborative decision-making.

Implementing ESD in Traditional Education

Implementing ESD requires significant changes in traditional educational practices. It must be included at all levels of formal education and training, as well as in non-formal and informal learning settings. ESD focuses on the learning needed to sustain and enhance our quality of life and that of future generations.

Benefits of ESD

ESD helps people gain the knowledge, values, and skills necessary to make decisions that improve our quality of life both locally and globally, without harming the planet for future generations. It encourages sustainable lifestyles and promotes understanding of the impact of individual and collective actions on the environment.

How Schools Can Integrate Sustainability Education Curriculum Integration

Integrating sustainability into the curriculum is essential. Subjects such as science, geography, and social studies can incorporate lessons on environmental issues and sustainable practices. Developing interdisciplinary projects can help students see the connections between different areas of study and sustainability.

Experiential Learning

Experiential learning through field trips, outdoor classrooms, and community projects can provide hands-on experience with sustainability concepts. These experiences help students understand the real-world applications of their learning and develop a deeper connection to the environment.

School-Wide Sustainability Initiatives

Schools can implement sustainability initiatives such as recycling programs, energy conservation measures, and sustainable gardening projects. Involving students in these initiatives can teach them practical skills and the importance of collective action.

Partnerships with Local Organizations

Collaborating with local environmental organizations and businesses can provide additional resources and expertise for sustainability education. These partnerships can offer students opportunities for internships, volunteer work, and real-world problem-solving.



By Swpanil Tiwari

How Schools Can Integrate Sustainability Education

Curriculum Integration

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The Role of Teachers and Administrators

Professional Development

Teachers and administrators need ongoing professional development to stay informed about the latest sustainability practices and educational strategies. Training programs and workshops can help educators integrate sustainability into their teaching effectively.

Creating a Supportive Environment

A supportive school environment is crucial for successful sustainability education. This includes providing necessary resources, fostering a culture of environmental awareness, and encouraging student-led initiatives.

The Long-Term Impact of Sustainability

Educating students about sustainability has long-term benefits that extend beyond the classroom. These benefits include:

Environmental Stewardship

Students who learn about sustainability are more likely to become environmentally conscious adults who advocate for and practice sustainable living. This shift in behavior can lead to significant environmental benefits over time.

Informed Decision-Making

Sustainability education equips students with the critical thinking skills needed to make informed decisions about their personal and professional lives. This knowledge helps them consider the environmental impact of their choices and promotes responsible behavior.

Community Engagement

Students who understand the importance of sustainability are more likely to engage with their communities to address environmental issues. This engagement can lead to stronger, more resilient communities that prioritize sustainability.



CIRCULAR ECONOMY

"CIRCULAR ECONOMY REFERS TO MODELS OF PRODUCTION AND CONSUMPTION THAT MINIMIZE WASTE AND REDUCE POLLUTION, PROMOTE SUSTAINABLE USES OF NATURAL RESOURCES, AND HELP REGENERATE NATURE."

New EU Rules Seen to Restrict Exports of Textiles, Footwear

The European Union has recently introduced new eco-design regulations aimed at enhancing the sustainability of products within the bloc. These stringent guidelines are expected to have significant repercussions for Indian exporters, especially smaller businesses. One of the pivotal aspects of this regulation is the ban on the destruction of unsold textiles and footwear, a move that could potentially limit orders and reshape the export landscape.



Comprehensive Sustainability Requirements

Durability, Reusability, and Energy Efficiency

The recently issued guidelines mandate several critical requirements for products, focusing on durability, reusability, and energy efficiency. These regulations align with broader EU initiatives, such as the carbon border adjustment mechanism (CBAM) and deforestation regulations. CBAM, in particular, is viewed as a unilateral move that may face challenges at the World Trade Organization (WTO). The new eco-design regulations will become effective 24 months after their publication in the official journal.

Eco-design Requirements for Energy Efficiency

Certain products will need to meet minimum energy efficiency standards. These eco-design requirements aim to reduce the environmental impact throughout a product's lifecycle. This comprehensive approach reflects the EU's commitment to environmental sustainability and positions it as a global leader in green policy.

Impact on Indian Exporters

Challenges for Small and Medium Enterprises (SMEs)

The new regulations pose significant challenges for Indian exporters, particularly small and medium enterprises (SMEs). Mithleshwar Thakur, Secretary General at the Apparel Export Promotion Council, emphasized the sudden impact these changes have on smaller players. Thakur advocates for government

Non-Tariff Barriers

Industry experts also describe the new regulations as a form of non-tariff barrier. They argue that the Indian government should highlight these concerns during free trade negotiations, as the new norms could negate the benefits of any tariff reductions being pursued. Despite temporary exclusions for SMEs, the measures are not deemed sufficient to mitigate the overall impact.

Broadened Scope of the Eco-design Regulation



Inclusion of a Wide Range of Products

Certain products will need to meet minimum energy efficiency standards. These eco-design requirements aim to reduce the environmental impact throughout a product's lifecycle. This comprehensive approach reflects the EU's commitment to environmental sustainability and positions it as a global leader in green policy.



Public Procurement and Digital Services

The eco-design criteria will also be applied in public procurement to promote the purchase of green products. Additionally, the regulation will align with the Digital Services Act, ensuring that products sold online meet these rigorous standards.

Specific Requirements Under the New Regulation

Product Durability and Reusability

The regulation introduces new requirements focusing on product durability, reusability, upgradability, and reparability. These standards are designed to extend the lifecycle of products, thus reducing environmental impact and promoting sustainability.

Energy and Resource Efficiency

Energy and resource efficiency are central to the new guidelines. Products will need to demonstrate efficient use of resources, minimizing waste and optimizing energy consumption. This approach is aimed at reducing the overall environmental footprint of products sold within the EU.



By Rita Fredericks

Circular Economy and Recycling

The regulation also includes norms regarding substances that restrict circularity, as well as requirements for recycled content, remanufacturing, recycling, and environmental footprints. These measures are intended to foster a circular economy, where products and materials are reused and recycled to the maximum extent possible.

Strategic Implications for Exporters

Adapting to New Market Conditions

Exporters, particularly those from India, will need to adapt to these new market conditions swiftly. This includes investing in sustainable practices and ensuring compliance with the EU's rigorous standards. Failure to do so could result in significant barriers to market entry and competitiveness.

Government and Industry Collaboration

There is a clear need for enhanced collaboration between the government and industry bodies to address these challenges. By working together, they can develop strategies to address the impact of the new regulations and ensure that Indian exporters remain competitive in the EU market.

The European Union's new eco-design regulations represent a significant shift towards sustainability, with far-reaching implications for exporters worldwide. For Indian businesses, particularly SMEs, these regulations present both challenges and opportunities. By embracing sustainable practices and ensuring compliance, exporters can not only meet the new standards but also enhance their competitiveness in the global market.





DECARBONIZATION

"DECARBONIZATION MEANS REDUCING THE AMOUNT OF GREENHOUSE GAS EMISSIONS THAT A SOCIETY PRODUCES, AS WELL AS INCREASING THE AMOUNT THAT IS BEING ABSORBED."

Sustainability Sector to Boost Job Creation



In recent years, the term “sustainability” has surged in popularity, driven by the urgent need to address the worsening effects of climate change. Both corporate sectors and government bodies have recognized that incorporating sustainability into their operations is essential for maintaining our way of life. As a result, an increasing number of jobs are being created to support the transition to a functional entity that balances environmental stability with economic growth, paving the way for a healthier and more sustainable future.

Resource Management and Responsible Consumption

Managing resources well is crucial for sustainability because it ensures that resources will be available for future generations. With the growing problems of climate change, resource depletion, and social inequality, it's essential to change how we educate people. Teaching sustainability isn't just an extra topic; it's a key step in preparing the next generation to tackle these complex issues.

In areas like architecture that significantly impact the environment, sustainable practices are especially important. Teaching students about sustainability helps them think critically, solve problems, and make informed decisions. This education promotes long-term thinking and a comprehensive approach, which are essential for addressing today's challenges.

Cultivating Innovation Through Sustainability Education

Teaching about sustainability encourages people to use resources wisely and make positive changes. When students learn how their actions affect the environment, they are more likely to adopt eco-friendly habits. This education also sparks new ideas.

By learning about sustainable design, we encourage creative solutions to environmental problems. This is especially important in architecture, where new designs can reduce environmental impact and build a more sustainable world. India's rich cultural diversity is perfect for promoting sustainable ways of living. Many traditional methods in farming, building, and resource management are already sustainable. Keeping these practices alive helps preserve cultural heritage and teaches future generations the importance of sustainability.

Job Creation in Renewable Energy Sectors

The renewable energy sector is a big source of job creation in sustainability. The solar energy industry alone is expected to create up to 3.26 million jobs by 2050, and the wind energy sector could add 180,000 jobs by 2030. Additionally, the bioenergy and green hydrogen sectors are predicted to generate 270,000 and 600,000 green jobs by 2030, respectively. These numbers show a huge potential for job growth in renewable energy, thanks to increasing investments and supportive policies. For example, India's Ministry of New and Renewable Energy reports that the country is the fourth-largest contributor to renewable energy worldwide, ranking fourth in wind power capacity and fifth in solar capacity.

Growth of Electric Vehicles and Sustainable Transportation

The rise of electric vehicles (EVs) is expected to create a lot of jobs. By 2030, the EV industry could provide 10 million direct jobs and 50 million indirect jobs. This growth is due to the switch from traditional gas engines to electric ones, which needs new skills and infrastructure to support the expanding EV market. Additionally, the textile industry is becoming more sustainable, potentially creating 45 million eco-friendly jobs. This change is driven by adopting green practices and technologies to lessen the environmental impact of making textiles.

Recycling and Waste Management Initiatives

Waste management is a key area for creating green jobs. By the middle of the 21st century, half of India's population will live in urban areas, producing a lot of waste. To handle this, many skilled waste workers will be needed to manage various types of waste from cities and towns.

Though there's no official data on waste pickers in India, the George Institute for Global Health estimates there are 1.5 million waste pickers in the country, making up about 10% of the global waste sector workforce. The biggest areas in waste management are e-waste and wastewater management. According to the Skills Council for Green Jobs and Sattva Consulting, e-waste management currently employs over one million people informally and could create an additional 500,000 jobs.

Promoting Green Initiatives in Traditional Industries

More than 138 Indian companies have pledged to achieve net-zero emissions by 2050. Leading this green transition are the automotive, construction, and textile industries. A study by EY highlights the potential for creating green jobs through the adoption of sustainable practices in these traditional sectors. The sustainability sector offers huge opportunities for job creation in various fields. Renewable energy, electric vehicles, waste management, and sustainable textiles are all driving economic growth while protecting the environment. By incorporating sustainability into education and training, encouraging innovation, and promoting green initiatives in traditional industries, we can create a sustainable future that benefits both our economy and the planet.



The renewable energy industry is growing 12% faster than the US economy, opening up a range of lucrative jobs on all levels



By Narendra Nor

India Encounters Substantial Challenges in the Agriculture Sector



By Rajni Dhankanthi

India is dealing with rising food prices due to problems with the supply. To manage this, the government has taken steps to stabilize prices and ensure there's enough food available. These steps include stopping rice exports and allowing free imports of pulses and oilseeds until March 2025. Additionally, they have stopped exporting onions and certain oilseed products. While these measures provide quick relief, long-term solutions are needed to fix deeper issues. Working together with farmers, agribusinesses, and policymakers is crucial to making these efforts more effective.



Rural Distress

Rural India is struggling because there are fewer job opportunities and the non-farm sector isn't growing fast enough. Farmers are getting low prices for their crops, which has caused political problems in rural areas. To help, the government is trying to create more non-farm jobs and increase farmers' incomes by giving them better access to markets and support. Improving rural infrastructure, like roads, electricity, and irrigation, is also important to ease these problems.

Comprehensive development programs that address both economic and social needs are necessary to enhance the quality of life in rural areas.

Climate Change and Weather Extremes

Climate change is causing unpredictable weather, which is making farming much harder. There are more droughts, floods, and out-of-season rains, all of which hurt crop production. To help farmers deal with this, we need to invest in crops that can withstand extreme weather and teach adaptive farming techniques. Providing weather insurance can also give farmers financial protection against bad weather. Improving irrigation systems and using sustainable water management can lessen some of the negative effects. Long-term, we need to focus on strong research and development in sustainable farming to tackle climate change.

Soil Health and Degradation

Soil health is getting worse because of too many chemical fertilizers and pesticides. To make the soil healthy again, farmers need to use sustainable farming methods like crop rotation and organic farming. The government should help by promoting soil testing and giving subsidies for organic materials to encourage these practices. Teaching farmers about soil conservation is key for long-term soil health. More research and support services can help by giving farmers the knowledge and tools they need to farm sustainably.

Water Management

Water is being used inefficiently, and groundwater levels are dropping, which are big problems for Indian farming. Using micro-irrigation systems like drip and sprinkler irrigation can help save water. The government should focus on collecting rainwater and restoring traditional water sources to improve water availability. Policies should encourage the use of crops and farming methods that use less water. Improving irrigation systems and promoting sustainable water management practices are essential for the long-term success of agriculture.

Agricultural Reforms and Policy Environment

The drive for agricultural reforms slowed down after the three farm Bills were withdrawn in 2021. Moving forward, the government plans to introduce reforms to make approval processes easier and ensure high standards. Better management of fertilizer subsidies and reducing waste are crucial. Creating a supportive policy environment for agrochemicals can help increase exports and attract investments. These reforms aim to modernize agriculture and boost productivity. Keeping everyone involved, including farmers, agribusinesses, and policymakers, is vital for these reforms to succeed. Building agreement among these groups is key to fostering agricultural growth. Despite the challenges, there are hopeful signs for Indian agriculture. The Modi 3.0 government has a strong plan to address these issues, and a good monsoon in 2024 is expected to boost production and help control prices. Even with a poor monsoon in 2023, the sector still managed to grow by 1.4%. The government's 100-day plan for reforms looks promising and aims to improve agricultural stability and growth. Effective implementation and monitoring of these policies are essential for success. Overall, the future looks positive for agricultural stability and growth, which will benefit the wider economy.



REGENERATIVE AGRICULTURE

REGENERATIVE AGRICULTURE REDUCES GREENHOUSE GASES AND CONSERVES WATER, UNLIKE INTENSIVE FARMING, WHICH WORSENS EMISSIONS AND BIODIVERSITY LOSS.

Understanding the Components of Soil: An Overview of Soil Profile

As we know, soil is the ground beneath our feet, and it is also considered a well-known topic in Biology. Soil acts as a reservoir for nutrients and supports various ecosystems. It comes in various types like sandy soil, clay soil, and loamy soil. Different plants grow better in different types of soil. Soil is essential for plants to grow and provide them with nutrients and support. It's like a home for plants, helping them stay healthy and strong. Here, we briefly describe the soil, soil profile, soil profile diagram, and layers of soil.



By Kirti Rawal

pH CONTROL

pH

TEMPERATURE



BALANCE



What is Soil?

Soil is a natural resource that forms the Earth's surface layer through the interaction of organic matter, minerals, water, air, and living organisms. It provides a medium for plants to grow, supports various ecosystems, and plays a crucial role in the Earth's biogeochemical cycles. Soil composition varies, but typically includes minerals, organic matter, water, and air. Different types of soil have varying levels of fertility, influencing their ability to sustain plant and animal life. Now, let us discuss some more about soil:

Soil Horizons:

Soils are often organized into layers or horizons. The top layer, known as the topsoil, is rich in organic matter and is where most plant roots grow. Below this, there are subsoil layers that contain minerals leached down from the above layer.

Soil Types:

Fertile soil contains a balance of essential nutrients like nitrogen, phosphorus, potassium, and micronutrients. Plants rely on these nutrients for growth. Soil fertility can be natural or enhanced through agricultural practices like fertilization and crop rotation.

Soil Erosion and Conservation

Soil erosion occurs when wind, water, or human activity removes the topsoil. This process can lead to land degradation. Conservation methods like contour plowing, cover cropping, and terracing are used to prevent erosion and maintain soil health.

Soil and Ecosystem:

Soil is vital for various ecosystems, supporting plant life and, consequently, a diverse range of animals. Healthy soil promotes biodiversity and contributes to ecosystem services like water filtration and carbon storage.

What is a Soil Profile?

A soil profile is a vertical cross-section of the soil that displays all of its horizons (layers) from the surface down to the bedrock. It provides a detailed view of the soil's composition, structure, and other properties at a specific location. Soil profiles are typically studied for soil fertility, drainage capabilities, and suitability for various agricultural or construction purposes. Soil profiles help scientists and farmers comprehend the soil's characteristics, including its texture, color, nutrient content, and depth of the different layers. By analyzing the soil profile, experts can make informed decisions about land use, crop selection, irrigation practices, and soil management techniques.

Soil Profile Diagram

A soil profile diagram is a visual representation of the layers (horizons) of soil from the surface down to the bedrock. In the soil profile diagram mentioned below, there is a brief description of almost all the layers of the soil such as Topsoil (A Horizon), Subsoil (B Horizon), Parent Material (C Horizon), and Bedrock. These layers are depicted vertically, showing their relative thickness and characteristics.

Soil profile diagrams are essential tools for understanding the composition and quality of soil in a specific area, aiding in agricultural, ecological, and engineering assessments.

Components of Soil

Soil is a complex system with several important components and functions. Understanding soil composition and health is essential for sustainable agriculture, environmental conservation, and overall ecosystem well-being.



Different Components of Soil

| Components | Description |
|----------------|---|
| Minerals | Weathered rock particles, including sand, silt, and clay. |
| Organic Matter | Decomposed plant and animal material, enriching soil fertility. |
| Water | Provides moisture for plants; soil acts as a water reservoir. |
| Air | Space between soil particles allows for gas exchange (oxygen, etc.) |

Soil Horizons:

Soil is made up of mineral particles derived from weathered rocks. These particles include sand, silt, and clay, and their proportions determine the soil's texture.

Organic Matter:

Dead plants and animal material decompose in the soil, forming organic matter. This organic matter provides nutrients to plants and enhances soil structure.

Water:

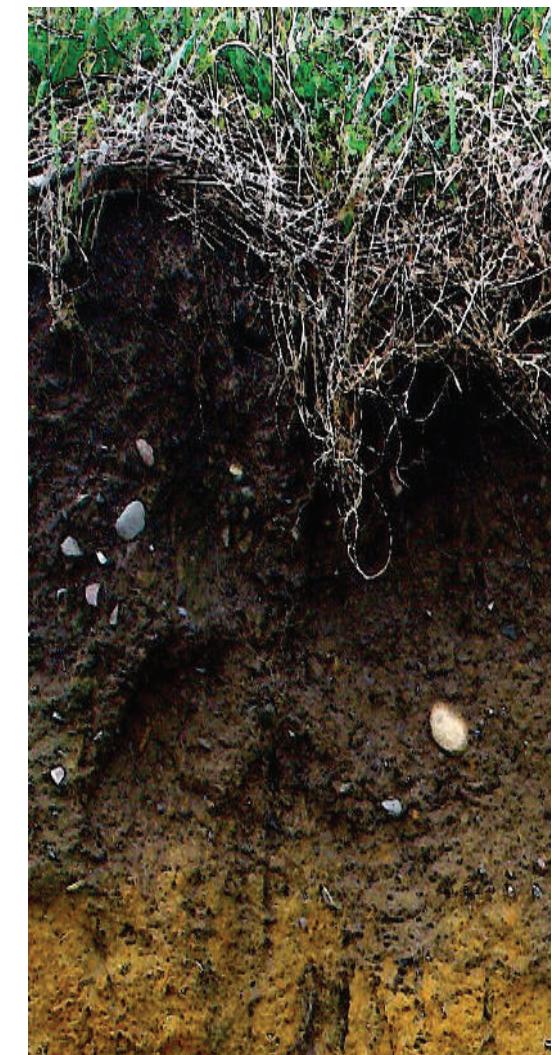
Soil acts as a reservoir for water, crucial for plant growth. Different soils have varying water-retaining capacities.

Air:

Spaces between soil particles allow for the exchange of gases between the soil and the atmosphere. Plants and soil organisms require oxygen for respiration.

Layers of Soil

Soil is typically composed of several layers, known as soil horizons. Each layer has its unique characteristics, and the composition can vary widely depending on factors like climate, vegetation, and geological processes. The main layers are:



| Soil Layers | Description |
|--------------------|---|
| O Horizon | It is the topmost layer of the soil, rich in organic material. |
| A Horizon | The A horizon is also known as topsoil, which is rich in minerals and organic material. |
| E Horizon | Leached layer, light in color and nutrient-poor. |
| B Horizon | Subsoil accumulates minerals and nutrients. |
| C Horizon | Partially disintegrated rock, lacks organic material. |
| Bedrock | The solid rock beneath the soil layers. |

O Horizon:

This is the topmost layer of the soil, composed mainly of organic material like decomposed leaves and plant matter.

A Horizon

This layer is rich in minerals and organic material. It's where most plant roots grow and where many biological and chemical activities occur. The germination of seeds takes place in the Topsoil.

E Horizon

This layer is light in color and leached of minerals and nutrients. It's often found in forest ecosystems.

B Horizon

This layer accumulates minerals and nutrients leached down from the topsoil. It contains minerals like iron, aluminum, and clay.

C Horizon:

This layer accumulates minerals and nutrients leached down from the topsoil. It contains minerals like iron, aluminum, and clay.

Bedrock:

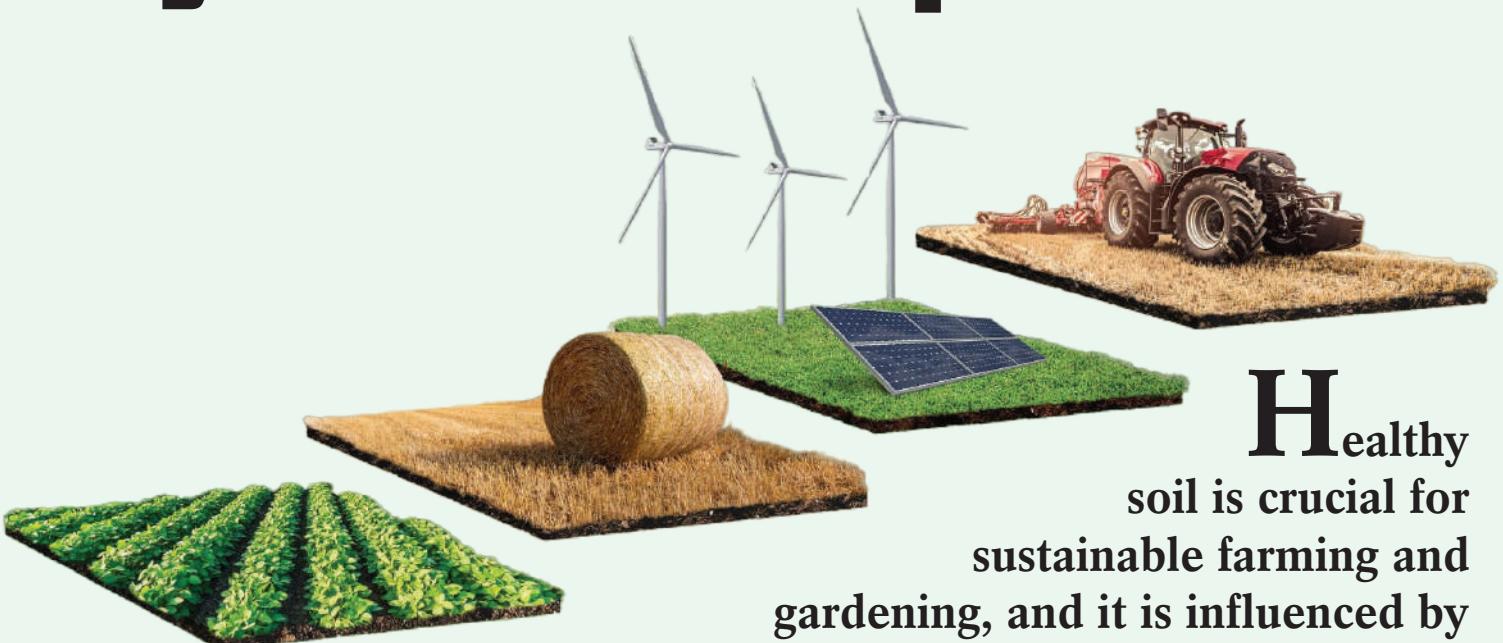
This is the solid rock beneath the soil layers. Roots do not penetrate this layer, and it is not considered part of the soil profile in terms of plant growth.



INDIGENOUS KNOWLEDGE

"INDIGENOUS PEOPLES' WAYS OF LIFE ARE INHERENTLY LOW-CARBON AND FOSTER SELF-SUSTAINING ECOSYSTEMS."

Understanding Natural Cycles that Impact Soil



Healthy soil is crucial for sustainable farming and gardening, and it is influenced by several natural cycles. Here, we explore three essential cycles that play a significant role in maintaining soil health: the Carbon Cycle, the Nitrogen Cycle, and the Hydrologic Cycle.

The Carbon Cycle

Soil contains a vast amount of carbon—more than all the plants, animals, and the atmosphere combined. According to the USDA, soil organic matter holds about four times more carbon than living plants. When this organic matter is depleted, it releases carbon dioxide into the atmosphere. To keep carbon compounds in the soil, it's vital to practice minimal soil disturbance, maintain vegetation cover year-round, and limit the use of synthetic materials.

The combination of “living, dead, and very dead” organic matter is essential for retaining soil carbon.

The Nitrogen Cycle

Nitrogen is a critical nutrient for plants, and its availability in soil is closely linked to organic matter levels. Each percentage point of organic matter in the top six inches of soil contains about 1,000 pounds of nitrogen. Microorganisms in the soil convert this nitrogen into forms that plants can absorb.

Synthetic nitrogen fertilizers, although commonly used, are produced through an energy-intensive process that emits a significant amount of CO₂. In contrast, planting cover crops like legumes naturally fixes nitrogen from the air, offering a more sustainable and less polluting alternative.



By Krishna Kanu

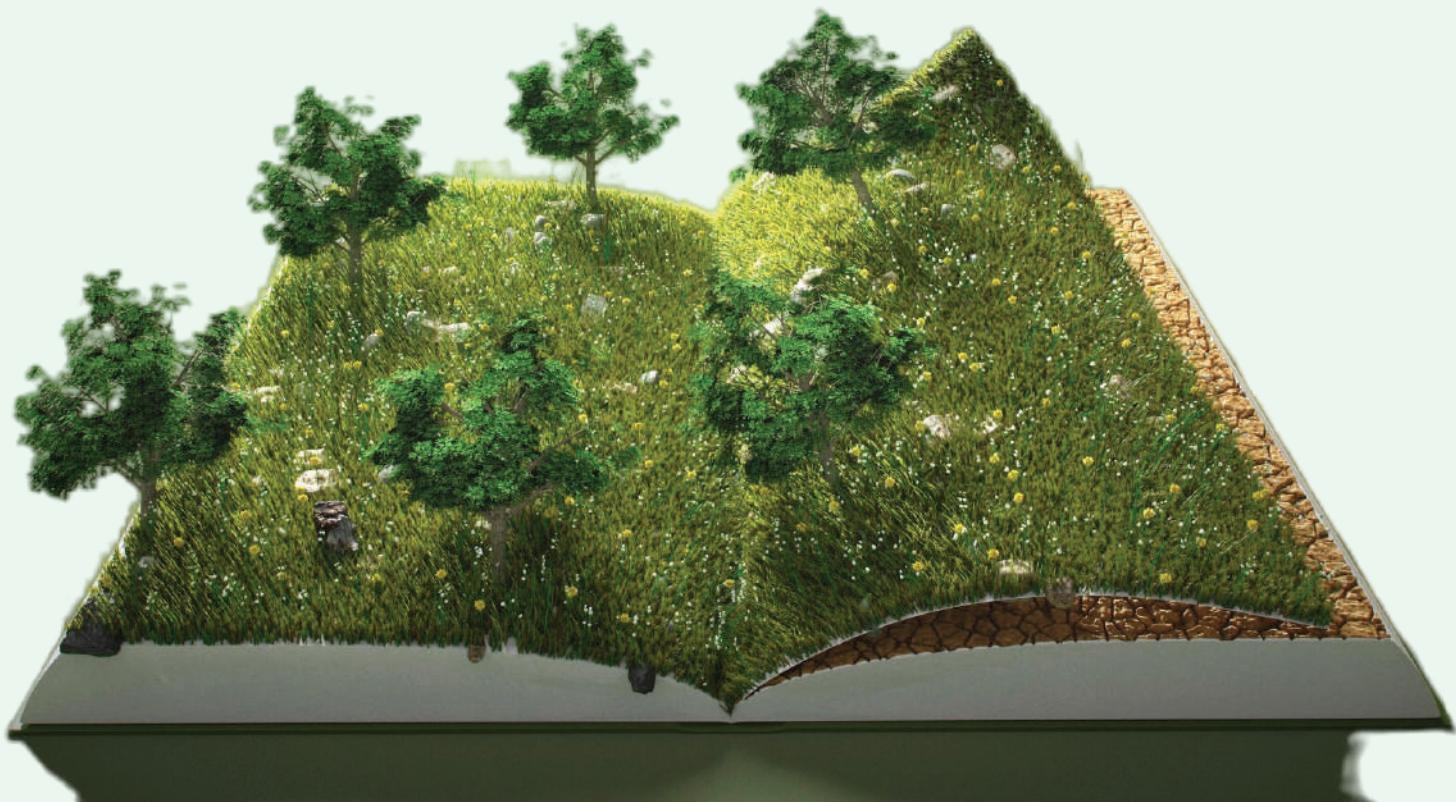
The Hydrologic Cycle

The rate at which water infiltrates soil affects not only your field but also nearby water bodies and the ocean. Soils rich in organic matter and minimally disturbed improve water infiltration through clay and reduce rapid water flow through sand. Water that seeps deep into the subsoil may recharge aquifers, but it can also carry harmful chemicals, impacting the local water supply. Soil erosion, driven by rainfall, can take various forms, including splash, sheet, and rill erosion. Healthy organic matter, comprising “living, dead, and very dead” components, helps mitigate erosion and supports plant resilience.

Conclusion

Enhancing soil health is fundamental to sustainable agriculture and environmental stewardship. By implementing practices such as cover cropping, crop rotation, reduced tillage, organic amendments, and integrated pest management, farmers can significantly improve soil health. These practices not only boost agricultural productivity and profitability but also contribute to environmental conservation and resilience against climate change. Ensuring soil health is maintained and improved is essential for the long-term viability of farming systems and the well-being of our planet.

The carbon cycle is nature's blueprint for life and climate stability.







Carbon Footprint: How Our Actions Today Impact the Planet Tomorrow

Every time you charge your phone, start your bike, use a paper to write, or various innumerable activities that you do daily results in the emission of various greenhouse gases into the atmosphere which is the major cause for the pressing issue of global warming and the unforeseen climatic changes that are happening all over the world. The United Nations has warned that if we do not neutralize the emissions through decarbonizing the economy, a very inhospitable future for humanity might just be around the corner. In this article, we will explore the role of Carbon in Climate change and how it impacts our lives and the earth as a whole.

What is Carbon Footprint?

Footprint simply means the reminiscence of our actions or in the context of environmental issues, our collective human movement. Carbon Footprint is the overall trace of Carbon released into the environment in the form of greenhouse gas emissions. This environmental measure tracks both direct and indirect emissions of gases such as methane, nitrogen oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and especially carbon dioxide, which has been the most significant contributor to global warming since 1990.

The World Meteorological Organization stated that the rate of greenhouse gas emissions peaked in 2019 at its all-time high and today's levels of atmospheric CO₂ are at comparable levels as it was three million years ago when the temperature of the earth was warmer than 3°C and sea levels were 10 to 20 meters higher than current levels. So far, Carbon footprint has not stopped and it has kept on increasing since 1961 and now accounts for 60% of man's total impact on nature.

Footprint by an Individual

The amount of carbon emissions released by an individual's moving acting eating and utilizing resources is measured as a personal Carbon Footprint. Environmental NGO The Nature Conservancy estimates that each inhabitant on the planet



produces an average of almost four tons of CO₂ every year, and in the United States, each emits four times more than the average of the rest of the world. The experts suggest that if we don't want the global temperature to touch the threshold of 2 °C we all have to reduce our Carbon footprint to less than 2 tons by 2050.

The Carbon Footprint of Companies

Large Corporations also produce greenhouse gases during their manufacturing, transport, and energy consumption. The amount of Carbon emitted is on a much larger scale in comparison to the Individual. Companies usually have the option to reduce their carbon footprints by implementing better policies and actions such as improving their energy efficiency, consuming renewable energy, running awareness campaigns and following ESG(Environment Social & Governance) compliances as well as paying green taxes and buying tons of Carbon Credits on the international market.



By Dipti Chavan

The Carbon Footprint of a Product

Consumer products and services contribute to greenhouse gas emissions at every stage, from getting raw materials, through manufacturing and distribution, to their use and disposal. This pollution starts with extracting and processing raw materials, making the products, and getting them to consumers, continuing as they are used and eventually become waste, which might be reused, recycled, or sent to a landfill. Events like concerts, shows, and sports games also have a significant carbon footprint because of factors like transportation, energy use, and the waste they produce.

How to Reduce Your Carbon Footprint

The next few years are crucial in our fight against climate change, and our success will depend on how well we can reduce our carbon footprint. Here are some simple tips to help you do that:

Shop Smart and Local:

Buy local products and support sustainable production. Consider starting your garden, even if it's a small one in your urban space.

Travel Green:

Use public transportation, ride a bike, walk, or choose eco-friendly vehicles.

Use Renewable Energy:

Opt for 100% renewable energy sources, buy energy-efficient appliances, and be mindful of your heating and cooling to save energy.

Spread Awareness:

Educate yourself and others about the importance of reducing our carbon footprint.

Reduce Waste:

Reuse and recycle packaging, and if you can't, make sure to dispose of it properly.

Reducing our carbon footprint is something we all need to work on together. Every small action we take, like choosing local products, using green transportation, and saving energy, can add up to make a big difference. If we all do our part, we can have a positive impact on the environment now and for future generations. Our collective efforts today will help create a healthier, more sustainable planet for everyone.

**Our planet
does not
belong
to us, we
belong to
our planet**



The Importance of R&D in Addressing Agricultural



By Vandana Prajapati



Every time you charge your phone, start your bike, use a paper to write, or various innumerable activities that you do daily results in the emission of various greenhouse gases into the atmosphere which is the major cause for the pressing issue of global warming and the unforeseen climatic changes that are happening all over the world. The United Nations has warned that if we do not neutralize the emissions through decarbonizing the economy, a very inhospitable future for humanity might just be around the corner. In this article, we will explore the role of Carbon in Climate change and how it impacts our lives and the earth as a whole.

Varietal Enhancements

Consider the transformative impact of technological breakthroughs on crops like cotton and maize. Bt cotton, for instance, has substantially reduced pesticide usage, safeguarding both farmer health and environmental integrity. Similarly, in maize cultivation, hybrid varieties and improved crop management practices have led to enhanced yields, rendering India self-sufficient in this vital food source. Innovations such as Direct Seeded Rice (DSR) further exemplify the power of precision agriculture, conserving water and reducing greenhouse gas emissions, all while boosting farmer productivity.

while boosting farmer productivity. Embracing

While genetically modified (GM) crops remain a subject of contention, evidence underscores their potential benefits. Bt cotton, for example, has significantly reduced insecticide dependency, resulting in higher yields and increased farmer incomes. Golden Rice, fortified with Vitamin A, holds promise in combating childhood blindness. These instances highlight the significant contributions of GM technology, subject to rigorous testing and regulation, in enhancing food security and nutritional well-being.

Addressing Persistent Challenges

Despite significant strides, challenges persist in the realm of agricultural R&D. Public investment in research and development necessitates a substantial boost to bridge the gap between scientific innovation and on-farm application. Strengthening extension services and farmer education is imperative to ensure the widespread adoption of new technologies.

Prioritizing Environmental Sustainability

Environmental sustainability must remain a top priority in agricultural endeavors. Climate-smart agriculture practices, including conservation agriculture and agroforestry, play a pivotal role in mitigating the impacts of climate change while promoting biodiversity and soil health. Agroecological approaches, which emphasize natural processes and ecosystem services, offer viable alternatives to conventional farming methods reliant on synthetic inputs.

Embracing sustainable practices, deploying genetic engineering responsibly, and fostering collaborative R&D endeavors are imperative for safeguarding food security and nutrition. By prioritizing innovation and sustainability, India can navigate the challenges ahead and emerge as a global leader in agricultural resilience and food security. With concerted efforts from policymakers, researchers, farmers, and stakeholders across the agricultural value chain, India can build a resilient and sustainable food system that meets the needs of present and future generations.

Collaboration for Accelerated Progress

Policy support is indispensable in propelling the transition towards sustainable agriculture. Incentives for eco-friendly practices, subsidies for renewable energy adoption, and regulations to curb agrochemical misuse are essential components of this framework. Moreover, investment in rural infrastructure, such as irrigation systems and storage facilities, is imperative to enhance agricultural productivity and market access.

Leveraging International Collaborations

International collaboration catalyzes accelerated progress towards sustainable agriculture. Platforms like the United Nations' Sustainable Development Goals and initiatives such as the Climate Smart Agriculture Alliance facilitate knowledge sharing, technology transfer, and joint research initiatives. By leveraging global partnerships, countries can learn from each other's experiences and innovations, fostering collective action and knowledge exchange.



CARBON SINK

"A CARBON SINK ABSORBS MORE CARBON DIOXIDE FROM THE ATMOSPHERE THAN IT RELEASES, WITH FORESTS, OCEANS, AND SOIL BEING THE LARGEST NATURAL CARBON SINKS."

ICAR CTCRI Celebrates 61st Foundation Day in the Presence of the Hon'ble Governor of Kerala

On July 9th, 2024, the ICAR-Central Tuber Crops Research Institute (ICAR-CTCRI) celebrated its 61st Foundation Day, graced by the esteemed presence of the Hon'ble Governor of Kerala, Mr. Arif Mohammed Khan.



ICAR-CTCRI is the world's sole research organization dedicated entirely to tropical tuber crops and is a vital constituent of the Indian Council of Agricultural Research (ICAR). The institute has recently made significant strides in tuber crop research, greatly contributing to agricultural innovation and food security. These achievements underscore ICAR-CTCRI's commitment to pioneering agricultural research and innovation, ensuring a brighter and more secure future for farmers and the broader farming community. In his address on the occasion, Governor Khan highlighted the evolution of tuber crops from being considered the "poor man's food" to becoming an integral

part of Indian cuisine, now featured even on five-star hotel menus. He commended ICAR-CTCRI for its relentless efforts in advancing tuber crop research and empowering farming communities across the country. Governor Khan also recognized the exceptional contributions of ICAR-CTCRI's scientists, staff, and research scholars by presenting awards to the best performers. His acknowledgment of their dedication and hard work further emphasized the institute's role in pioneering agricultural innovation.

The event saw the presence of notable figures, including Dr. G Byju, Director of ICAR-CTCRI, and Prof. Chandrabhas Narayana, Director of the

Rajiv Gandhi Centre for Biotechnology. Their attendance highlighted the collaborative efforts and shared vision for advancing agricultural research. On this occasion, Dr. Santhosh Mithra was awarded the Best Scientist Award for Technology Transfer of the E-Crop device for Smart Farming, licensed to M/s Tech Visit IT Pvt Ltd, Mumbai.

The celebration showcased ongoing advancements in tuber crop research, reiterating ICAR-CTCRI's commitment to agricultural innovation. Root and tuber crops, which include starchy roots, tubers, rhizomes, corms, and stems, are primarily used for human consumption, animal feed, and the production of starch, alcohol, and fermented

beverages such as beer. The institute's research has played a crucial role in enhancing the productivity and utility of these crops, significantly contributing to food security and agricultural sustainability.

ICAR-CTCRI's achievements reflect its unwavering dedication to improving the agricultural sector and supporting farmers. As the only research organization in the world solely dedicated to tropical tuber crops, ICAR-CTCRI continues to lead the way in agricultural research and innovation, ensuring a brighter and more secure future for the farming community and the nation as a whole.





CLIMATE OVERSHOOT

"CLIMATE OVERSHOOT REFERS TO THE PERIOD WHEN GLOBAL WARMING EXCEEDS 1.5°C BEFORE POTENTIALLY FALLING BACK DOWN."

Warming Is Getting Worse. So, They Just Tested a Way to Deflect the Sun



In the face of increasing global temperatures and unprecedented climate change, innovative solutions are urgently needed. One such cutting-edge approach being explored involves deflecting a portion of the sun's rays to cool the Earth temporarily. This experimental technology was recently tested on a decommissioned aircraft carrier in San Francisco Bay, where scientists embarked on the first outdoor trial in the United States. This groundbreaking initiative could pave the way for new methods to combat global warming effectively.

The First Outdoor Test: A Glimpse into the Future

On a crisp Tuesday morning, engineer Matthew Gallelli stood on the deck of the decommissioned aircraft carrier, pulling on ear protectors before flipping a switch. The machine, resembling a snow maker, began to rumble, producing a deafening hiss as a fine mist of tiny aerosol particles shot hundreds of feet into the air. This marked the first outdoor test of technology aimed at brightening clouds to reflect some of the sun's rays back into space. The objective was to see if the machine could consistently spray the right size of salt aerosols into the open air, a crucial step towards potentially altering cloud compositions above the Earth's oceans.

The Growing Need for Climate Intervention

With the relentless burning of fossil fuels and the resultant increase in atmospheric carbon dioxide, the goal of keeping global warming within 1.5 degrees Celsius above preindustrial levels is becoming increasingly elusive. This has propelled the idea of deliberate climate intervention from theoretical discourse into practical consideration. Various stakeholders, including universities, private investors, and the federal government, are funding efforts ranging from carbon dioxide removal to ocean iron fertilization.

As Robert Wood from the University of Washington, the lead scientist on the marine cloud brightening project, notes, the urgency of climate change is driving the field to explore even once-extreme options.

Scientific Endeavors and Historical

What is Marine Cloud Brightening?

Marine cloud brightening, a form of solar radiation modification or solar geoengineering, aims to push solar energy back into space by brightening clouds. Unlike injecting aerosols into the stratosphere, this method is localized and uses relatively harmless sea salt aerosols. The concept is based on the Twomey effect, which posits that a larger number of smaller droplets can reflect more sunlight than fewer, larger ones. By spraying vast quantities of tiny aerosols, scientists hope to enhance cloud reflectivity and mitigate global warming.

Challenges and Controversies

Despite its potential, marine cloud brightening is fraught with challenges and controversies. Critics argue that such interventions could have unpredictable consequences, altering climatic patterns not just over the sea but also over land. David Santillo of Greenpeace International warns that large-scale deployment could have hard-to-predict outcomes. Karen Orenstein from Friends of the Earth U.S. labels solar radiation modification

The idea of brightening clouds to combat global warming is not new. It dates back to 1990 when British physicist John Latham proposed injecting tiny particles into clouds to offset rising temperatures. This concept, although once considered bizarre, has gained renewed interest as climate change accelerates. Dr. Latham's vision involved a fleet of unmanned, sail-powered vessels continuously spraying seawater droplets to reflect solar heat. This pioneering idea laid the groundwork for today's marine cloud brightening experiments.

Technological Innovations: The Role of the Old Salts

The journey from theoretical concept to practical application involved significant technological innovation. In 2006, Bill Gates funded research by David Keith and Ken Caldeira, leading climate scientists. They enlisted Armand Neukermans, a seasoned Silicon Valley engineer, to develop a nozzle capable of spraying sea salt aerosols. The team, known as the Old Salts, worked for years, eventually creating a device that could produce particles of the ideal size for cloud brightening.

Testing on the Hornet: A Critical Milestone

The culmination of this research was the test aboard the USS Hornet. The sprayer, named CARI (Cloud Aerosol Research Instrument), and its associated equipment were carefully calibrated to expel a fine mist of aerosols into the air. The test aimed to determine whether the aerosols maintained their size and properties under varying wind and humidity conditions. The data gathered will be crucial for understanding the feasibility and potential impact of marine cloud brightening on a larger scale.

Future Prospects and Global Interest

The successful testing of CARI marks a significant step forward, but there is still much to learn. Researchers estimate that another decade of tests will be needed before marine cloud brightening could be deployed at a scale sufficient to cool the Earth. Meanwhile, interest in this technology is growing worldwide. Australian researchers have conducted similar experiments, and private funding for climate intervention projects is increasing. Organizations like Silver Lining are spearheading efforts to advance research and prepare for potential large-scale implementation.

As global temperatures continue to rise, innovative solutions like marine cloud brightening are becoming increasingly vital. While there are significant challenges and uncertainties associated with such technologies, ongoing research and testing are essential to determine their viability. The recent test aboard the USS Hornet represents a crucial milestone in the journey towards potentially groundbreaking climate intervention strategies. As we continue to explore these options, the ultimate goal remains clear: to mitigate the devastating impacts of climate change and secure a sustainable future for our planet.



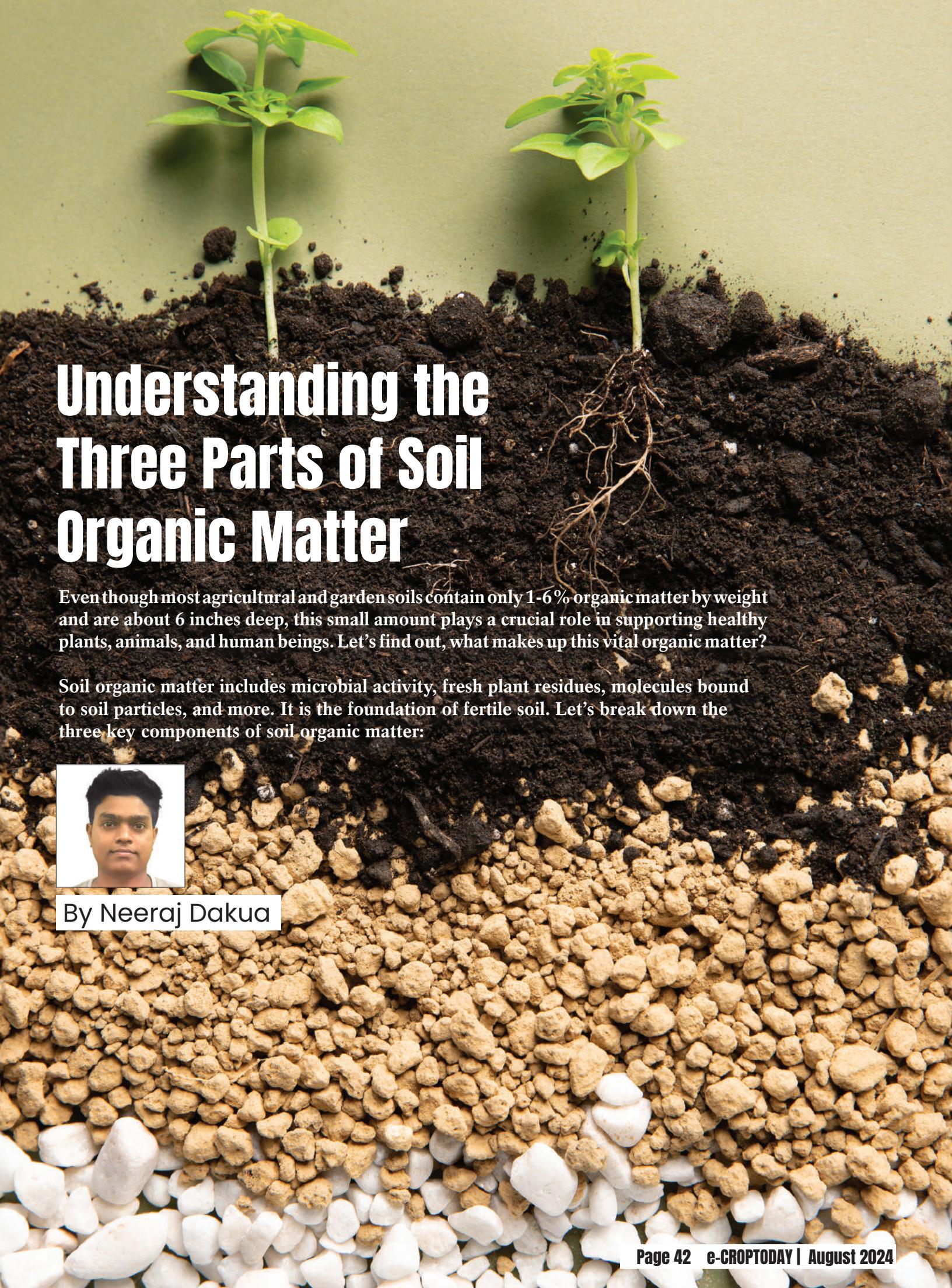
By Pooja Bhise





GLOBAL WARMING VS. CLIMATE CHANGE

"GLOBAL WARMING IS THE INCREASE IN EARTH'S AVERAGE TEMPERATURE DUE TO HIGHER CONCENTRATIONS OF GREENHOUSE GASES FROM HUMAN ACTIVITIES."



Understanding the Three Parts of Soil Organic Matter

Even though most agricultural and garden soils contain only 1-6% organic matter by weight and are about 6 inches deep, this small amount plays a crucial role in supporting healthy plants, animals, and human beings. Let's find out, what makes up this vital organic matter?

Soil organic matter includes microbial activity, fresh plant residues, molecules bound to soil particles, and more. It is the foundation of fertile soil. Let's break down the three key components of soil organic matter:



By Neeraj Dakua

The Living Part of Soil Organic Matter

The living portion of soil organic matter makes up about 15% of the total. This diverse range of organisms represents roughly 25% of the world's total biodiversity. These live organisms, including microbes, insects, and earthworms, play a major role in soil fertility by decomposing organic matter and converting it into nutrients available for plants. Microbes can reduce a compost pile by 70-80% when given the right conditions. Earthworms, by burrowing, create channels for root growth and water infiltration, leaving behind substances that support soil structure. Larger organisms like moles, voles, and birds also contribute by breaking down organic material and mixing it into the soil.

The Dead Organic Matter

When microorganisms die, they become part of the “dead” organic matter. This includes crop residues and compost in various stages of decomposition. Dead organic matter is continually broken down by soil microbes, providing nutrients for themselves and for plants. While this decomposition process is crucial, it can also lead to rapid changes in the soil, impacting its health and fertility. Farming and gardening practices like tilling and crop rotations can affect this process. For instance, tilling increases the speed of decomposition,

releasing CO₂ but also providing a short-term nutrient burst for plants. Practices like crop rotations and cover cropping improve the quantity and diversity of soil microbes, enhancing soil health over time.

The Very Dead Organic Matter

The very dead organic matter, often called humus, is the stable part of soil organic matter that decomposes slowly. Humus can remain in the soil for hundreds or even thousands of years. It plays a crucial role in improving soil structure, tilth, and cation exchange capacity (CEC). Humus contains fulvic and humic acids, which transport nutrients from the soil to plant roots. Humus benefits your soil for generations, contributing to its dark color, which helps the soil warm up faster in spring. This stability makes humus essential for long-term soil health and fertility.

How To Incorporate More Organic Matter for Healthy Soil

Incorporating organic matter into your soil can be challenging, but it's essential for maintaining soil health. Leaving plant residue on the soil surface may look untidy, but it's beneficial for the microbial community and overall soil health. Using soil amendments and adopting regenerative practices can greatly improve soil quality over time.

Potential for Your Crop

Cover crops and crop rotation can retain moisture, prevent erosion, and increase biological activity in the soil, leading to greater fertility. This combination supports the microbial community and improves soil health, directly and indirectly boosting crop productivity.

Direct Benefits:

Nutrients are converted into ● plant-available forms.

Soil retains more essential ● nutrients like calcium, potassium, and magnesium.

Micronutrients become ● available to plants.

Microbes and plants form ● beneficial relationships for nitrogen fixation.

Certain microbes make ● phosphorus available to plants.

Indirect Benefits:

Microorganisms promote ● better root growth.

Plants develop stronger root ● systems, taking up more nutrients and water.

Improved soil structure. ●

Better water infiltration and ● CEC in clay soils.

Increased water retention in ● sandy soils.

Reduced problems with ● pests and diseases.



NET ZERO

"REACHING NET ZERO REQUIRES BALANCING CARBON DIOXIDE EMISSIONS FROM HUMAN ACTIVITY WITH EFFORTS TO REMOVE CARBON DIOXIDE, STOPPING FURTHER INCREASES IN GREENHOUSE GASES."



Save our Soil: Innovative Approaches to Combat Soil Erosion

Soil erosion is considered one of the leading problems of the environment these days. In recent times soil erosion has taken a major toll on the farming and forestation sector. Soil erosion in recent times has been taken into consideration by various organizations globally as a challenge.

Prioritizing the Save Soil initiative is one of the major goals internationally.

Soil erosion is a major reason for the degradation of soil and the wearing away of soil. This leads to a reduction in the productivity of soil for farming and other uses. One of the trending challenges that is being considered on priority by environmentalists is soil erosion and its effects on the environment.

In this article, we are going to thoroughly discuss soil erosion and its effect on various sectors globally.

But first, let us understand

What is soil erosion?

Soil erosion is the deterioration in the quality of soil due to wind, water, glaciers, and other factors of the environment. Soil erosion is one of the priority conditions that create the need for organizations like Precision Grow to operate on a global level. With the use of equipment and advanced technology Precision Grow can prove to be a boon for global tracking of soil erosion and help in reducing the same after studying the causes of the same.

We can help evaluate the conditions and places where soil erosion is a major cause of reduced productivity.

Effects of soil erosion

Loss of topsoil:

The main effect which is important is the loss of topsoil. Degradation of farms by a reduction in topsoil is one of the ill effects on land which can lead to infertile soil from the point of view of farming. Apart from this, it can eventually also affect the rest of the land by turning it into barren land and can also lead to the destruction of forests.

Degradation of water quality:

Soil erosion has a major effect on the quality of water which can in turn lead to reduced productivity in agriculture and forest. Degraded water can degrade productive farms and natural vegetation due to a lack of nourishment.

Increased risk of flood:

Soil erosion can be very dangerous as it loses the capacity to withstand natural calamities and in turn, leads to conditions like floods. This can also lead to loss of land and productivity.

Loss of biodiversity:

Loss of vegetation can have a major impact on land, forest, and natural vegetation. This is because every life requires favorable conditions for growth and development and erosion of soil can make a favorable environment unfavorable for some or the other living being. Apart from this, several other effects lead to a major impact on the environment which are caused due to soil erosion.

Save Soil Initiative:

Nowadays many organizations are taking the initiative to help in the improvement of soil quality to restore the forests and fields creating major change in productivity.

In recent times organizations like Isha Foundation have prioritized soil saving with Sadguru founder of Isha Foundation leading the initiative. This initiative has been acknowledged by the United Nations, Geneva, and WHO.

In this initiative, the Isha Foundation has launched campaigns where they have taken over the testing and maintenance of soil at the national level and have successfully carried the same at the global level.

At Precision Grow, we provide technologically advanced equipment and strategies that can go hand in hand with organizations who are actively looking to carry forward such initiatives that can help reduce soil erosion by mapping and restoring soil quality. It is one of the aims that we try to achieve i.e. to make the environment and conditions favorable for agriculture to help the growth of the agriculture industry by restoration of crops and trees to the maximum level of its capacity.

Based on this blog we would like to conclude that with technological advancements and with the help of globally recognized organizations like Precision Grow and Isha Foundation's collaborative efforts we can easily tackle such conditions of the environment on a higher scale and make the earth an environmentally favorable planet for living and vegetation.

Soil is the earth's skin; when it erodes, the planet's health is compromised.



By Snehal Nagwekar

Farmers Benefiting from High-Yielding Varieties of Chinese Potato, Elephant Foot Yam, and Cassava



By Vivek Yadav



A recent stakeholders' interface programme on 'Improved technologies of tuber crops for sustainable income' was organised at Ambasamudram by the Indian Council of Agricultural Research - Central Tuber Crop Research Institute (ICAR-CTCRI), Thiruvananthapuram. The programme aimed to benefit horticultural farmers, particularly those involved in the cultivation of Chinese potato, elephant foot yam, taro, and cassava in the Tirunelveli and Tenkasi districts.

Introduction to Improved Tuber Crop Varieties

Deputy Director of Horticulture, Elangovan, inaugurated the interface, explaining the technological interventions by ICAR-CTCRI for the development of major tuber crops. The primary focus was on high-yielding varieties that have significantly increased farmers' income and encouraged the expansion of cultivated areas under these improved varieties.

High-Yielding Varieties: A Boon for Farmers

Elangovan highlighted the yield improvements with CTCRI's varieties:

Chinese Potato: Sree Dhara

Elephant Foot Yam: Sree Padma and Gajendra

Cassava: Sree Jaya, Sree Vijaya, Sree Pavithra, and Sree Reksha

These improved varieties have doubled farmers' income, showcasing the potential for economic growth and sustainability in the horticultural sector.

Tuber crops are crucial for agricultural biodiversity and play a significant role in food security and nutrition world wide.

Technological Interventions and Innovations

ICAR-CTCRI has developed various technological solutions and critical inputs to support farmers in Tirunelveli and Tenkasi districts. One notable innovation is the Micronol formulation, designed to enhance the growth and yield of tuber crops. Additionally, specialized equipment like the Chinese potato grader has been introduced to improve efficiency and productivity in tuber crop farming.

Contributions to Tuber Crop Development

Director of ICAR-CTCRI, G. Byju, presided over the event, emphasizing the institute's contributions through seed villages and demonstration plots. These initiatives have played a crucial role in disseminating knowledge about improved varieties, technologies, and machinery to farmers across Tamil Nadu.

Micronol for Taro: This formulation is currently being validated on-farm in twelve taro fields in Tirunelveli and Tenkasi

Engagement with Farmers

Principal Scientist, Muthuraj, Senior Scientist, D. Jaganathan, and Senior Technician, D. T. Rejin, along with other experts, addressed the 30 progressive farmers who participated in the interface. They discussed the prospects and challenges in tuber crop farming, aiming to formulate future action plans that would further benefit the farmers.

Formulating Future Action Plans

The interface programme also served as a platform for stakeholders to discuss and address various challenges faced by farmers in tuber crop cultivation. This collaborative approach aims to develop effective strategies that ensure sustainable income and long-term growth for farmers in the region.

The Impact of High-Yielding Varieties

The introduction of high-yielding varieties of Chinese potato, elephant foot yam, and cassava has had a transformative impact on the farming community. By adopting these improved varieties, farmers have experienced a significant increase in yield and income, contributing to their overall well-being and economic stability.

Economic Benefits

Increased Income: The improved varieties have doubled the income of farmers, providing them with better financial security.

Area Expansion: The success of these varieties has encouraged farmers to expand their cultivated areas, leading to increased production and supply of tuber crops.

Sustainable Farming Practices

Efficient Use of Resources: The technological interventions and innovations by ICAR-CTCRI have enabled farmers to use resources more efficiently, reducing wastage and improving productivity.

Enhanced Crop Management: The development and distribution of critical inputs like Micronol have improved crop management practices, leading to better growth and yield of tuber crops.

Future Prospects and Challenges

While the introduction of high-yielding varieties and technological innovations has brought numerous benefits, there are still challenges that need to be addressed. The stakeholders' interface programme provided a platform to discuss these issues and develop actionable plans for the future.

Future Prospects and Challenges

While the introduction of high-yielding varieties and technological innovations has brought numerous benefits, there are still challenges that need to be addressed. The stakeholders' interface programme provided a platform to discuss these issues and develop actionable plans for the future.

Looking Ahead

The future of tuber crop farming looks promising with the ongoing efforts by ICAR-CTCRI and other stakeholders. By addressing the challenges and leveraging the benefits of high-yielding varieties and technological innovations, farmers can achieve sustainable income and long-term growth.

Addressing Challenges

Pest and Disease Management: Farmers need support in managing pests and diseases that affect tuber crops. Research and development of resistant varieties and effective pest control measures are essential.

Market Access: Ensuring that farmers have access to markets where they can sell their produce at fair prices is crucial for their economic sustainability.

Training and Education: Continuous training and education programmes for farmers on the latest technologies and best practices are necessary to ensure the successful adoption of improved varieties and techniques.





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