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-AGRITitbits

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Agri Titbits is an effort to collect and preserve agricultural news, especially spices, appearing in newspapers and online media.

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Malayalam News

SPICES

This Is How Much Turmeric You Need to Reduce Inflammation

READER'S DIGEST-21-DEC-2018

Turmeric is a bright orange-yellow spice that's a staple ingredient in Asian cooking. Now, you can find it as an ingredient in everything from teas and lattes to protein bars and supplements. Its popularity has to do with research showing turmeric has potential anti-inflammatory benefits. Anywhere from 500 to 2,000 mg of turmeric per day might be an effective dose, especially in extract form, Healthline reports. Experts note that the best, safest amount to take depends on a few factors.



First, there are a few different ways to take turmeric. Common options include the root powder, a turmeric extract, or a curcumin supplement. Curcumin—the main active component which gives turmeric its anti-inflammatory and antioxidant properties—only makes up 3 percent of dry turmeric, according to Ali Webster PhD, RD, Associate Director of Nutrition Communications, International Food Information Council Foundation. “Turmeric extracts or isolated curcumin found in dietary supplements are much higher in curcumin, so they’re more likely to have an impact on inflammation than the dried spice,” she says. So a dash of turmeric in the occasional recipe may not have lasting anti-inflammatory effects—unless a person consumes turmeric or curcumin supplements on a regular basis, too. Here are 10 proven ways to fight inflammation.

Most research says that taking in at least one gram of curcumin per day is necessary for measurable anti-inflammatory effects, Webster says. The Arthritis Foundation recommends 400 to 600 milligrams (mg) of turmeric capsules, three times per day, or half to three grams of the root powder per day for inflammation relief. Other studies on arthritis patients show benefit from one gram of curcumin per day. Here are 9 more things that happen when you eat more turmeric.

It's also important to note that the body doesn't absorb the spice well by itself, according to Malina Linkas Malkani, MS, RDN, CDN, media spokesperson for the Academy of Nutrition and Dietetics. Malkani recommends combining turmeric with black pepper and a source of fat like olive oil or avocado for maximum absorption. Although the amount normally used for cooking is safe for humans and likely won't cause side effects, consuming extremely high amounts could cause gastrointestinal issues like an upset stomach, nausea, diarrhea, as well as dizziness, according to Malkani and Webster.

The main takeaway is that if you are considering taking turmeric, or any other supplementation for inflammation, you really need to let your doctor know—especially if you take other medications. All of them must be reviewed to determine if any potential drug interactions exist that would pose a health risk, says Nesochi Okeke-Igbokwe, MD, a physician and health expert. For instance, if one were taking certain blood thinner medications, taking turmeric as well may heighten the risk of bleeding.

More research is necessary to determine a specific dose of turmeric or curcumin guaranteeing health benefits, but it won't hurt to add some of the ground spice to your recipes or to speak with your doctor about possible supplementation and proper dosage. Next, check out 15 vitamins (and supplements) nutritionists don't take—so you shouldn't either.

International Pepper Community learns about Vietnamese market

International Pepper Community comprising nearly 40 representatives from pepper associations in the US, China, some European and African nations; together with foreign and domestic pepper businesses visited black pepper planting models in the southern province of Ba Ria-Vung Tau on December 5.

The visit aims at surveying black pepper area, productivity, quality as well as production method in the province and helping businesses to determine the crop's development potential in the province and the country also.



That provides a chance for Vietnamese firms to connect with foreign partners to learn about pepper standards and demand in the world market and have suitable direction in production and trading.

Turmeric may improve after Feb 2019

THE HINDU BUSINESSLINE-19-DEC-2018

“Certainly 2019 will be a good year for turmeric traders and farmers as the price may go up with good upcountry demand”, says VK Rajamanickam a trader. The assessment is based on possible drop in output in Nizamabad and some parts of Maharashtra. Meanwhile, at the Erode Turmeric Merchants Association finger turmeric was sold at ₹5,339–8,008 a quintal; and root variety at ₹4,980–7,074. At the Regulated Marketing Committee finger turmeric fetched ₹6,489–7,599 and root variety ₹5,896–6,899.

RESEARCH NEWS

New research on curcumin's health benefits

NATURAL PRODUCTS INSIDER-10-DEC-2018

The big question about turmeric and curcumin asks how long its explosive growth will last. Will this superstar spice ingredient sustain its popularity and reach omega-3 status

or fade into the background as a once-hot natural product trend? Thanks to the wide body of data generated in recent years, curcumin's benefits categories have broadened substantially.

Sports nutrition is an up-and-coming benefit sector for curcumin, especially in light of its potential to reduce inflammation and soreness caused by strenuous exercise. The antioxidant benefits of curcumin and its ability to modulate inflammatory pathways underscores its potential as an adjunct to recovery.¹



In a recent randomized, double-blind, placebo-controlled study, curcumin was shown to be an effective supplement for recovery after strenuous exercise.² An additional study also reported a reduction in 24-hour pain scores as well as increased muscle performance after a muscle-damaging exercise.³

Curcumin is also finding potential in heart health, where the effects of its anti-inflammatory properties are being researched. Recently, a highly bioavailable form of curcumin was studied in a healthy population to examine its role in endothelial function, which plays a critical role in cardiovascular health.⁴ Curcumin's direct impact on healthy circulation was measured using flow mediated dilation (FMD).

The randomized, double-blind, placebo-controlled study showed supplementing with 200 mg of curcumin had a clinically meaningful impact on potentially reducing cardiovascular disease by up to 50 percent in healthy individuals.

As the buzz around turmeric and its active component, curcumin, continues to spread, market opportunities for these popular ingredients are expanding.

New research on curcumin's role in sports nutrition and heart health proves companies are continuing to use a variety of innovative approaches to enhance curcumin's bioavailability and differentiate their products.

Research Looks at Natural Fertilizer for Greener Agriculture, Cleaner Water

VOICE OF AMERICA-16-DEC-2018

A project at the University of Michigan is aimed at making our water cleaner and our agriculture more sustainable by capturing a source of fertilizer, rather than flushing it down the toilet.

Fertilizer is made of nutrients like nitrogen and phosphorus. Chemical fertilizers require huge amounts of energy to produce. But there are other, natural and more readily available sources.

The University of Michigan, with support from the National Science Foundation, is working at making our water cleaner, and our agriculture more sustainable, by capturing one of those sources, rather than flushing it down the toilet.

On a hot summer afternoon near Brattleboro, Vermont, farmer Dean Hamilton has fired up his tractor and is fertilizing his hay field — with human urine.

It takes a bit of time to get used to, says environmental engineer Nancy Love.

“I’ve been surprised at how many people actually get beyond the giggle factor pretty quickly,” she said, “and are willing to listen.”

Fine-tuning the recycling

Rich Earth Institute, a nonprofit, is working with Love and her team. Abraham Noe-Hays says they are fine-tuning new methods to recycle urine into fertilizer.

“There’s a great quote by Buckminster Fuller about how pollution is nothing but the resources that we’re not harvesting, and that we allow them to disperse because we’ve been ignorant of their value,” he said.

Harvesting the resource of urine — which is, after all, full of the same nutrients as chemical fertilizer — will fix two problems at once: eliminate waste and create a natural fertilizer.

The Rich Earth Institute has been using urine as fertilizer since 2012. Kim Nace says they collect about 26,000 liters a year, thanks to a loyal group of dedicated donors.

“We now have people who have some source-separating toilets in their homes. We also have people who have 55 gallon (200-liter) barrels where they collect and then we transport to our farms, and we’ve also got a large urine depot,” Nace said.

They pasteurize the urine to kill any microbes, and then it is applied directly onto hay fields like Hamilton’s.

Next level of project

Now that they’ve partnered with the University of Michigan, Love says they’re looking to take their project to the next level.

“There are three things we really are trying to do with the urine in this kind of next phase. We’re trying to concentrate it. We’re trying to apply technologies to reduce odor, and we’re trying to deal with trace contaminants like the pharmaceuticals,” she said.

Dealing with pharmaceuticals is an important issue. Heat urine kills germs but has no effect on chemicals like drugs that pass through our bodies.

“We know pharmaceuticals are a problem for aquatic organisms and water systems,” Love said. “It’s debatable about the impact on human health at very, very low levels. Independent of that, I think most people would prefer that they not be in their food.”

21st century infrastructure

For Love, this is all about redesigning our wastewater infrastructure for the 21st century. Too many nutrients in the water leads to poor water quality by causing hazardous algal blooms.

“Our water emissions are going into very sensitive water bodies that are vulnerable to these nutrient loads,” she said. “We need to change that dynamic. And if we can capture them and put them to a beneficial use, that’s what we’re trying to do.”

Their efforts could make agriculture greener and our waterways cleaner.

IIT researchers show how plants can generate electricity to power LED light bulbs

In *Advanced Functional Materials*, the study shows that single plant leaves can generate more than 150 volts; a 'hybrid tree' made of natural and artificial leaves can act as an innovative 'green' electric generator

Sustainable energy sources, which are pollution free and environmentally friendly, are one of the key challenges of world's future society. The interdisciplinary team of roboticists and biologists at IIT-Istituto Italiano di Tecnologia in Pontedera (Pisa, Italy), found that living plants can help with electricity. Fabian Meder, Barbara Mazzolai and their coworkers at IIT discovered that living plants are literally "green" power source, which may become one of future's electricity supplies that perfectly integrates in natural environments and is accessible all over the world. Researchers discovered that plants can generate, by a single leaf, more than 150 Volts, enough to simultaneously power 100 LED light bulbs. Researchers also showed that an "hybrid tree" made of natural and artificial leaves can act as an innovative "green" electrical generator converting wind into electricity.

Results are published on *Advanced Functional Materials*.

The research team is based at Center for Micro-Bio Robotics (CMBR) of IIT in Pontedera (Pisa, Italy), coordinated by Barbara Mazzolai, and their goal is to perform advanced research and to develop innovative methodologies, robotic technologies and new materials, inspired by the natural world. Bio-inspired approaches can therefore help to develop robots and technologies that are more suitable for unstructured environments than today's solutions. In 2012 Barbara Mazzolai coordinated the EU funded project Plantoid, which brought to the realization of the first plant robot in the world. In this last study, the research team studied plants and showed that leaves can create electricity when they are touched by a distinct material or by the wind.

Certain leaf structures are capable to convert mechanical forces applied at the leaf surface into electrical energy, because of the specific composition that most plant leaves naturally provide. In detail, the leaf is able to gather electric charges on its surface due to a process called contact electrification. These charges are then immediately transmitted into the inner plant tissue. The plant tissue acts similar to a "cable" and transports the generated electricity to other parts of the plant. Hence, by simply connecting a "plug" to the plant stem, the electricity generated can be harvested and used to power electronic devices. IIT's researchers show that the voltage generated by a single leaf may reach to more than



IMAGE: The hybrid plant is made of natural and artificial leaves. When wind blows into the plant and moves the leaves, the 'hybrid tree' produces electricity

150 Volts, enough to simultaneously power 100 LED light bulbs each time the leaf is touched.

In the article, researchers additionally describe for the first time how this effect can be used to convert wind into electricity by plants. Therefore, researchers modified a Nerum oleander tree with artificial leaves that touch the natural *N. oleander* leaves. When wind blows into the plant and moves the leaves, the "hybrid tree" produces electricity. The electricity generated increases the more leaves are touched. Consequently, it can be easily up-scaled by exploiting the whole surface of the foliage of a tree or even a forest.

The study is a first essential step for a new project that Barbara Mazzolai will coordinate in 2019, the European-funded project Growbot whose aim is to realize bioinspired robots that implement plant-like growing motions. The new robots will be then partly powered by the new plant-derived energy source, showing that plants may become one of future's electricity supplies, accessible all over the world.

Findings reveal how neem cells produce useful chemicals

DOWN TO EARTH MAGAZINE-14-DEC-2018

The study of limonoid biosynthesis in neem tree is of potential significance as it produces agriculturally and pharmacologically important molecules

Neem has been known for its medicinal and insecticidal properties for centuries. Its chemicals, referred to as limonoids, give neem these properties. Indian scientists have now figured how limonoids are produced in neem.



Neem is a storehouse of useful chemicals, the most important being Azadirachtin A, which is a well known natural insecticide. It belongs to a class of chemicals known as tetranor-triterpenoids or limonoids. Over 150 limonoids have been isolated and characterised from different parts of neem tree so far, but the process of their production had so far remained unknown.

Limonoids possess very complex chemical structure in which isoprene units serve as building blocks. In higher plants, biosynthesis of isoprenes occurs through either of the two biosynthetic pathways—mevalonate pathway (MVA) or the methyl-erythritol phosphate pathway (MEP) or a combination of both.

A group of scientists from National Chemical Laboratory (NCL), Pune, Academy of Scientific and Innovative Research, and CSIR-Institute of Genomics and Integrative Biology, Delhi, have found that MVA pathway contributes to biosynthesis of limonoids in neem.

Researchers grew neem cells in an artificial growth medium supplemented with different glucose isotopes. The growing cells utilised these labelled glucose isotopes for synthesis of limonoid. For further confirmation, same studies were carried out in presence of MVA and MEP pathway specific chemical inhibitor. MVA pathway specific inhibitor—

mevinolin—drastically affected the growth and limonoid content, while MEP pathway inhibitor didn't interfere with biosynthesis of limonoids.

The group has also studied genes involved in the expression of key enzymes involved in MVA and MEP pathways. "Six genes were found to be active among which HMGR2 showed the highest expression. But its expression was found considerably reduced when the same analysis was performed with inhibitor treated cells. All these results confirmed that neem tree synthesizes limonoid by MVA pathway," says Dr H V Thulasiram, team leader, while speaking to India Science Wire.

"The study of limonoid biosynthesis in neem tree is of potential significance as it produces agriculturally and pharmacologically important molecules," says the study. It has been published in journal BMC Plant Biology. (India Science Wire)

Stem cell researchers develop promising technique to generate new muscle cells in lab

SCIENCE DAILY-12-DEC-2018

To help patients with muscle disorders, scientists at The University of Texas Health Science Center at Houston (UTHealth) have engineered a new stem cell line to study the conversion of stem cells into muscle. Findings appeared in Cell Reports.

"We have also developed a more efficient strategy to make muscles from human stem cells. Scientists can use these cells for disease modeling, gene correction, and potential cell therapy," said Radbod Darabi, MD, PhD, the study's senior author and an assistant professor in the Center for Stem Cells & Regenerative Medicine at McGovern Medical School at UTHealth.

Muscle disorders such as muscular dystrophy cause muscles to weaken and deteriorate, and they affect more than 50,000 people in the United States. Symptoms include difficulty walking and standing. In severe cases, the disorders might involve cardiac and respiratory muscles and lead to death. There is no cure.

Darabi's team engineered a novel human stem cell line for skeletal muscle. To ensure the purity of the muscle stem cells, they tagged muscle genes (PAX7, MYF5) with two fluorescent proteins. "In order to improve the formation of the muscle from stem cells, we screened several bioactive compounds. We were also able to observe muscle stem cell activity in great detail using color tags," he said.

In the lab housed in the Brown Foundation Institute of Molecular Medicine for the Prevention of Human Diseases at UTHealth, the team used a gene-editing method called CRISPR/Cas9 to add the fluorescent tags to the genes.

The stem cells were generated from a patient's skin cells and used to generate muscle. "Our current research provides a step-by-step roadmap to make muscle stem cells from these cells," Darabi said.

The team's "approach also allowed induction and purification of skeletal myogenic progenitors in a much shorter time course (2 weeks) with considerable in vitro and in

vivo myogenic potential (myofiber engraftment and satellite cell seeding)," the authors wrote.

The modified stem cells produced promising results in a culture of human tissue, as well as in a mouse model of Duchenne muscular dystrophy. "In a side-by-side comparison with previous strategies, our strategy allowed faster and more efficient generation of muscle stem cells with superior engraftment in mice," Darabi said.

Darabi believes these muscle stem cells will initially be used by researchers to study the pathophysiology of muscular dystrophies, create disease models that scientists can use to test promising drugs, or evaluate gene correction efficiency.

Human bodies are constantly replacing skeletal muscle cells but muscle disorders make it difficult to replenish muscle due to the failure and exhaustion of muscle stem cells. It is Darabi's hope that the cells can one day be used as a form of stem cell therapy.

Darabi's UTHealth coauthors are Jianbo Wu, PhD (lead author); Nadine Matthias, DVM; Jonathan Lo; Jose L. Ortiz-Vitali; and Sidney Wang, PhD. Also contributing to the paper's research is Annie Shieh, PhD, of State University of New York Medical School in Syracuse.

Darabi and Wang are on the faculty of The University of Texas MD Anderson Cancer Center UTHealth Graduate School of Biomedical Sciences. Ortiz-Vitali is a graduate student from the school.

Wang is an assistant professor at the Center for Human Genetics in the Institute of Molecular Medicine at UTHealth.

Wheat plants can switch chemical defenses to guard against pests

EARTH.COM-05-DEC-2018

Plants have built-in defense systems that help them cope with the pests and insects that feed on their leaves, fruit, stems, roots, and saps. Studying the underlying mechanisms of plant defenses is important for understanding plant biology.

When a plant is threatened, it can produce substances called benzoxazinoids that help with resistance to larvae or indirectly guards against aphids.

Maize plants have a switch that determines whether the plant releases a more toxic form of benzoxazinoids to guard against caterpillars or whether it produces less toxic benzoxazinoids that help induce the production of carbohydrates called callose that block cell walls so aphids can't feed on sap.

In a new study, researchers from the University of Bern in Switzerland and the Max Planck Institute set out to see if benzoxazinoids acted the same way in wheat as they do in maize.

The researchers were able to characterize the different functions of benzoxazinoids in wheat including the regulation of the toxic and less toxic forms of the substance.

The team identified that much like maize, a switch determined which defense method was used and found that the switch is an enzyme called methyltransferase enzyme.

Both maize and wheat contain the methyltransferase enzyme, but this enzyme evolved differently in the two cereal crops according to the results of the study.

The study was published in the journal Science Advances.

“Our approach was to introduce the maize switch into wheat and to permanently activate it. Together with our colleagues from the Leibniz Institute of Plant Genetics and Crop Plant Research, we made transgenic wheat plants which were no longer able to choose between toxin production and defense regulation, but constantly produced the toxic form of the benzoxazinoids. This enabled us to elucidate the functions of benzoxazinoids in wheat in detail,” said Tobias Köllner, a member of the research team.



After analyzing the different forms of toxin production, the researchers found that maize and wheat likely evolved the ability to produce benzoxazinoids independently of each other, which is called convergent evolution.

“Convergent evolution is widespread in nature and results from the fact that different species evolve a solution for the same problem independently from each other,” said Matthias Erb, a co-author of the study. “It is remarkable that two grasses which produce the same specialized defensive substances evolved the corresponding switch for their use independently of each other.”

Plants' defense against insects is a bouquet

SCIENCE DAILY-13-DEC-2018

Researchers have revealed how the mixture of chemical weapons deployed by plants keeps marauding insects off base better than a one-note defense. This insight goes beyond the ecological convention of studying a single chemical compound a plant is packing and offers new ways to approach agricultural pest management.

Michigan State University post-doctoral scholar Andrea Glassmire, an entomologist, checks out the leaves of the tropical shrub *Piper kelleyi*, nicknamed 'pink belly' because of the color of its young stems and leaves.



Michigan State University scholar Andrea Glassmire and her colleagues have revealed how the mixture of chemical weapons deployed by plants keeps marauding insects off base better than a one-note defense. This insight goes beyond the ecological convention of studying a single chemical compound a plant is packing and offers new ways to approach agricultural pest management. The research was published in today's Ecology Letters.

Glassmire, a post-doctoral scholar in MSU's Department of Entomology and colleagues from the University of Nevada, Reno, found important relationships between plant defensive chemistry in the neotropical shrub, *Piper kelleyi*, and its associated insect pests.

Since plants cannot move, they defend against pests that eat them using a bouquet of chemical compounds. Ecology, however, has been biased towards studying effects of single compounds even though a feeding insect would encounter a blend of plant compounds. It turns out that the type of defense bouquet matters, whether bouquets have the same compounds or a blend of different compounds.

"If we can figure out the specific type of defense bouquet that is most effective at reducing insect feeding, then we can extrapolate these findings to agricultural systems to cut down on pesticide use," said Glassmire.

Glassmire and colleagues manipulated plant chemical defenses in the Andes Mountains of Ecuador using a field experiment where plants were hung at different heights in the forest understory, exposing them to a range of light levels.

Their results suggest *P. kelleyi* plants consisting of defense bouquets having more kinds of defensive chemicals were more effective at reducing insect damage compared to defense bouquets having one kind of defensive chemical. The composition of defensive chemicals was dependent on the amount of light available. Subtle differences in light in the shaded forest understory induced changes in the defense bouquet. Remarkably, lower amounts of light increased the defense effectiveness of plants compared to higher amounts of light. Consequently, insect damage was reduced by up to 37% when *P. kelleyi* plants had bouquets of a blend of different compounds. Insects had difficulty consuming plants with different compound blends compared to plants with similar compound blends.

Understanding how plants' chemical defenses vary across the geographic landscape could have important implications for agriculture. Glassmire and colleagues' results suggest that feeding insects have difficulty adjusting to neighboring plants that are chemically different and that reduces damage. Agricultural systems comprising a single crop monoculture lack differences in their defense bouquet because they are all the same.

"I'm excited to see how future applications of this knowledge could help farmers," said Glassmire. "In the Wetzal lab, we are using a model crop system created by breeding commercial tomatoes with wild tomatoes to manipulate plant defense bouquets. This work will lead to new means of agricultural pest management in the future."

The paper was co-authored by Casey Philbin, Lora Richards, Christopher Jeffrey and Lee Dyer of the University of Nevada, Reno, along with MSU's Joshua Snook. The work was funded by the National Science Foundation, Earthwatch Institute, and a generous donation by the Hitchcock Fund for Chemical Ecology Research.

Plants as antifungal factories

EUREKALERT 10-DEC-2018

The results of this research published in the *Plant Biotechnology Journal* could impact the pharmaceutical and agri-food industries

Centre for Research in Agricultural Genomics (CRAG)

Researchers from the Spanish Research Council (CSIC) at the Centre for Research in Agricultural Genomics (CRAG) and the Institute for Plant Molecular and Cellular Biology (IBMCP), in collaboration with the IATA, have developed a biotechnological tool to produce, in a very efficient manner, antifungal proteins in plants. The results of this research, that could impact the agri-food and pharmaceutical sectors, have been published this week in the Plant Biotechnology Journal.



Disease-causing fungi that infect plants, animals and humans pose a serious threat to human and animal health, food security and ecosystem resilience. More people die every year from fungal infections than from malaria. Furthermore, fungal infections can have fatal consequences for at-risk immunocompromised patients with HIV/AIDS and organ transplantation, among others. In addition, fungi are a challenge to food security because they destroy major crops globally and contaminate food and feed with mycotoxins that are detrimental to animal and human health.

New antifungals

Maria Coca, researcher at CRAG and one of the senior authors of the study, explains that "only a few classes of antifungal agents are available today, and even these are not fully effective due to the development of resistance, host toxicity, and undesirable side effects. Many of these compounds do not even comply with the regulations, and therefore they cannot be used. Thus, there is an urgent need to develop novel antifungals, whose properties and mechanisms of action represent improvements on the existing ones, and which can be applied in diverse fields, including crop and postharvest protection, preservation in cosmetics, materials and food, and animal and human health." Coca's research group, in collaboration with the IATA's researcher Jose F. Marcos, aims to develop new antifungal compounds based on the antifungal proteins (AFPs) secreted by filamentous fungi. The problem is that the synthesis of these compounds is extremely complex; hence their exploitation requires efficient, sustainable and safe production systems.

A virus at the service of biotechnology

The CSIC researcher at the IBMCP José Antonio Daros is an expert in viruses that infect plants. Through genetic engineering, Daros and his team in Valencia managed to modify the tobacco mosaic virus (TMV) so that, instead of producing its own pathogenic proteins, it produced other proteins of interest. In Barcelona, the team led by Maria Coca implemented this tool to produce antifungal proteins in leaves of the *Nicotiana benthamiana* plant -a plant from the tobacco family widely used in research- discovering that these leaves produced large quantities of these new antifungals.

In addition, the researchers demonstrated that extracts recovered from the *N. benthamiana* plants are active against pathogenic fungi, being able to protect the tomato plant from the infection by the fungus *Botrytis cinerea*, better known as grey mould.

The work of the CRAG, IBMCP and IATA researchers shows that the plants can be used as biofactories of antifungal proteins for commercial purposes.

CLIMATE CHANGE

Climate change: Last four years are 'world's hottest'

BBC.COM | 29 NOVEMBER 2018

The year 2018 is on course to be the fourth warmest on record, according to the World Meteorological Organization.

It says that the global average temperature for the first 10 months of the year was nearly 1C above the levels between 1850-1900.

The State of the Climate report says that the 20 warmest years on record have been in the past 22 years, with the 2015-2018 making up the top four.

The WMO says that one of the factors that has slightly cooled 2018 compared to previous years was the La Niña weather phenomenon which is associated with lower than average sea surface temperatures.



Researchers say now that a weak El Niño is expected to form in early 2019 which might make next year warmer than this one.

Regardless of the impacts of these events, scientists say the long-term warming trend has continued in 2018 and they point to sea level rise, ocean acidification and glacier melt as examples of climate change.

"We are not on track to meet climate change targets and rein in temperature increases," said WMO Secretary-General Petteri Taalas.

"Greenhouse gas concentrations are once again at record levels and if the current trend continues we may see temperature increases 3-5C by the end of the century," he said.

Media caption UN Secretary General Antonio Guterres: "Climate change is a global issue, we are all failing".

"It is worth repeating once again that we are the first generation to fully understand climate change and the last generation to be able to do something about it," said Mr Taalas.



The WMO report says that for the most recent decade, 2009-2018, the average temperature increase was 0.93C above the pre-industrial baseline which is defined as being between 1850-1900. For the past five years, the average was 1.04C.

"These are more than just numbers," said WMO Deputy Secretary-General Elena Manaenkova.

"Every fraction of a degree of warming makes a difference to human health and access to food and fresh water, to the extinction of animals and plants, to the survival of coral reefs and marine life.

"It makes a difference to economic productivity, food security, and to the resilience of our infrastructure and cities. It makes a difference to the speed of glacier melt and water supplies, and the future of low-lying islands and coastal communities. Every extra bit matters."



The WMO report highlights some of the significant events of 2018. In the Indian state of Kerala more than five million people were affected by floods. Similarly in Japan, hundreds of people were killed by flooding.

There were also heat waves in large parts of Europe including the UK leading to wildfires in some places including Scandinavia.

In July and August there were numerous record high temperatures north of the Arctic Circle. Helsinki saw 25 consecutive days with temperatures above 25C.

There were major wildfires in the US with the Camp Fire in November claiming the most lives of any fire in over a century in the US.

Greece also had fatalities from fires, while British Columbia broke its record for the most land burned in a fire season.

Scientists involved in preparing the report say that the fingerprint of climate change can now be more clearly seen.

"The warming caused by these greenhouse gas emissions is already clear at the global scale," said Prof Tim Osborn from the University of East Anglia, who provided some of the data used in the WMO analysis.

"The knock-on effects for our regional climates and for severe weather events are beginning to emerge from the background variability of our weather."

The WMO State of the Climate report is one of a plethora of recent scientific studies that are designed to inform delegates to next week's UN climate talks in Poland. Negotiators will attempt to finalise the rule book of the Paris climate pact and to increase their commitments to cut carbon.

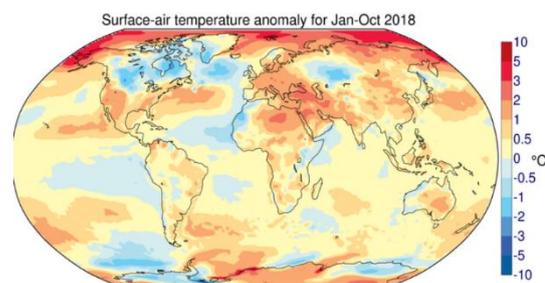


Image copyright WMO
Image caption This graphic shows the difference between recorded temperatures this year and the long term trend, with pronounced warming in the

BIODIVERSITY

Why biodiversity is key to our survival

DECEMBER 7, 2018 BY ERIC MURAILLE, THE CONVERSATION

Diversity, be it genetic, morphological, behavioural or ecological, is at the heart of many controversies. It fascinates us or worries us, depending on the context. But what is biological diversity? How useful is it, how is it generated and what are the foreseeable consequences of reducing it?

The incredible diversity of life

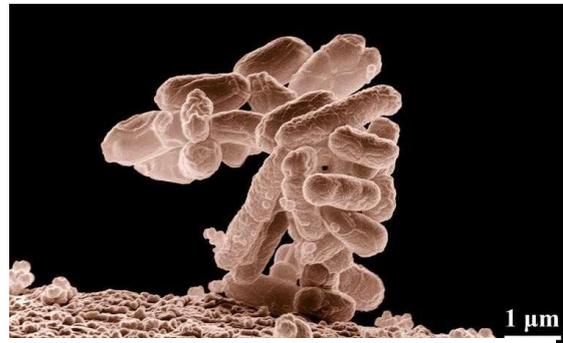
The life sciences have only recently begun to imagine the true extent of the diversity of life forms and the difficulty of quantifying it. Recent estimates of total eukaryotic diversity range from 1 to 5×10^7 species. Although only about ten thousand species of prokaryotes have been described, mainly because only a small number of bacteria can be grown in the laboratory, indirect molecular approaches (without culture) based on the analysis of DNA extracted from the environment suggest that there may be 10⁹ or more prokaryotic species. However, even these already astronomical figures do not reflect the real diversity of life forms.

First, genotypic diversity within the same prokaryote species can be incredibly high. Members of one bacterial species share parts of their genome encoding essential metabolic and informational functions (called the core genomes), but often carry unique, strain-specific sequences for adaptation to local environmental pressures. In the case of the bacterium *Escherichia coli*, the core genome represents only 6% of the genes present in 61 sequenced strains.

Secondly, the phenotypic diversity of living forms is greater than their genotypic diversity. Biological entities may exhibit complex life cycles with multiple states of differentiation and display phenotypic plasticity. This can confer the capacity to anticipate predictable seasonal changes or react to unpredictable changes by remodelling physiological processes to compensate for the potentially negative effects of changing conditions.

Third, genetically and morphologically identical individuals can also express considerable behavioural diversity. While behavioural variation among individuals in eusocial insect societies (queen and various workers) has been described since antiquity, the existence of individual behavioural specialization is now well documented throughout the animal kingdom.

Why such diversity?



E. coli bacteria. Credit: Eric Erbe, digital colorisation by Christopher Pooley, USDA

Darwin proposed that species diversity might increase the productivity of ecosystems due to the division of labour among species, suggesting that each species is unique in how it exploits its environment. It thus follows that species-rich systems can exploit resources more efficiently than species-poor systems (known as the complementarity effect).

Diversity is also thought to make ecosystems, species and populations more resilient to environmental stresses. A large number of species may imply a certain level of functional redundancy: the loss of one species has a smaller effect in a diverse system than in a species-poor one (known as the insurance effect). Genotypic or phenotypic diversity within one population of the same species may also improve resistance to environmental change. For example, it is well documented that the diversity of a population can increase its resistance to epidemics.

Diversity could also favour the emergence of complex collective behaviours, including in organisms without a nervous system, as demonstrated by the cooperative division of labour in certain species of bacteria. This allows groups of bacteria to assume mutually incompatible tasks and acquire new functions. In this way, multicellular cyanobacteria gain the ability to simultaneously perform photosynthesis and nitrogen fixation even though these two tasks are incompatible, as the oxygen produced during photosynthesis permanently damages the enzymes involved in nitrogen fixation.

How is diversity generated?

The neo-Darwinian theory of evolution proposes that biological diversity is the consequence of genetic accidents (mutations and recombinations of genes, for example) that occur spontaneously and randomly, without regard for their usefulness. However, the magnitude of adaptive gains from diversity suggests that partial control of its generation may be beneficial to the survival of biological systems. In support of this hypothesis, numerous examples of mechanisms generating individual genetic and phenotypic diversity, here called "diversity generators" (DG), have been described in systems ranging from prokaryotes to complex multicellular organisms.

While they may differ in their origin and components, these DGs share common functional properties. They contribute to the high unpredictability of the composition and behaviour of biological systems, promote robustness and cooperation among populations, and operate mainly by manipulating the systems that control the interaction of living entities with their environment.

The nature of DGs seems to depend on r/K reproductive strategies. Organisms with short generation time and large populations (r strategy) have reactive DGs, such as horizontal gene transfer and SOS systems. They generate diversity in response to environmental stresses and participate in the well-known Red Queen dynamic, where competitors must constantly evolve to survive: "Now here, you see, it takes all the running you can do to keep in the same place" (Through the Looking-Glass, Lewis Carroll, 1871).

The emergence of complex multicellular organisms, with a long reproductive life cycle and smaller populations (K strategy), has favoured the selection of a new class of DGs such as mandatory sexual reproduction and generation of a large adaptive immune repertoire, which act in anticipation of stress. Sexual reproduction, through the process of meiosis, allows for significant mixing of alleles between the parents and thus great genetic diversity for the offspring. Likewise, the adaptive immune repertoire is randomly generated by recombination of the genes encoding the antigen receptors within lymphocytes.

Its potential for diversity is such that an individual randomly expresses only a fraction, which ensures the maintenance of significant individual diversity of the immune response within populations. These DGs generate the distinct so-called White Queen dynamic in reference to the famous quote of the White Queen in *Through the Looking-Glass*: "Sometimes I've believed as many as six impossible things before breakfast." This metaphor seems particularly appropriate because the activity of these DGs is based on random phenotypic diversification, which is rarely adaptive at the individual level and favours the population (impossible things), and anticipates stress (before breakfast).

The existence of DGs leads us to consider evolution as a much more dynamic process and to give a new meaning to chance. If, as Einstein said, "God does not play dice," biological entities seem to do so frequently, which would partly explain their great adaptability and survival. The ubiquity of DGs in living organisms also confirms that diversity is essential for adapting to environmental stress and that regulated self-generation of diversity must be considered as a fundamental trait of biological systems.

What consequences?

It is urgent to reconsider the importance of diversity, which is more than just icing on the cake. It is both a property of living organisms and a necessary condition for their survival.

Education and fundamental research are both subject to an increasing number of evaluation criteria. While these controls were initially developed to optimise the outcomes, they also lead to standardisation. Yet, we should perhaps ask ourselves: is it wise to homogenise the intellectual formation of individuals and research activities, while diversity is a source of robustness, synergy and complexity in all living systems?

Global population growth will require sustained food production during the 21st century. However, the industrialisation of agriculture over the past 50 years has led to a dramatic fall in the diversity of agricultural products. Plants and animals have been intensively selected for strength and productivity. While this strategy led to good results over the short term, it is reasonable to doubt the ability of standardised populations to resist future climate changes that will likely lead to the emergence of new pathogens. Each particular genotype/phenotype is optimised for one given set of environmental conditions and only individual diversity can guarantee the adaptation of populations to unpredictable changes in their environment.

Finally, the importance of diversity in ensuring the robustness of biological systems suggests that decreasing the diversity of natural ecosystems could, in the near future, lead to their sudden disruption, which would further hamper our ability to maintain stable food production.

Bioenergy crops could be as bad for biodiversity as climate change

EUREKALERT (PRESS RELEASE)-10-DEC-2018

A large scale expansion in bioenergy crop production could be just as detrimental to biodiversity as climate change itself, according to new research.

The study, which involved expertise from Durham University's Department of Biosciences, investigated the potential impacts of future climate and land-use change on vertebrate biodiversity across the planet.

The authors argue there is an urgent need to carefully consider biodiversity when expanding bioenergy cropland, for example growing oil palm, maize and rapeseed.

Familiar species that would be predicted to decline substantially across their global range as a consequence of an expansion in bioenergy cropland combined with climate change include the hedgehog (44% potential loss), red squirrel (46% potential loss) and common starling (15% potential loss), say the researchers.

Globally, palm oil production is already known to be having a detrimental impact on orang-utan populations.

The study, which is published in the Proceedings of the National Academy of Sciences today, Monday 10 December 2018, was led by the Senckenberg Biodiversity and Climate Research Centre and the Technical University of Munich, Germany, in collaboration with Durham University.

Speaking about the research findings, Professor Stephen Willis, Durham University Department of Biosciences, said: "We found that the combination of climate change and large-scale expansion of bioenergy crops would together threaten about 36% of the habitats of all global vertebrate species, including many that are already the subject of significant conservation work.

"While bioenergy is clearly an important tool for climate change mitigation, the potential impacts on biodiversity must not be ignored.

"A strong reliance on bioenergy to combat climate change could result in outcomes for biodiversity that are little better than would occur if we didn't implement bioenergy strategies, despite the consequent climate change implications.

"Instead, we should be thinking about how to swiftly and significantly reduce energy consumption if biodiversity is to be protected."

In order to meet the Paris Agreement aims to keep the rise in global temperatures below two degrees Celsius above pre-industrial levels, many climate mitigation scenarios rely on increased bioenergy use, requiring large-scale production of crops such as corn, rape and oil palm.

As part of their study the team compared two scenarios. The first would result in global warming of approximately 1.5 degrees Celsius by the year 2100 and relies on a maximum use of bioenergy. Under the second scenario temperatures rise by approximately three degrees Celsius by the year 2100, with a very low use of bioenergy.

Dr Christian Hof, who conducted the study at the Senckenberg Biodiversity and Climate Research Centre and is now based at the Technical University of Munich, said: "In order to limit climate change in this way, we would need to cultivate bioenergy crops on



IMAGE: This is a hedgehog.

Credit: Professor Stephen Willis, Durham University

approximately 4.3 % of the global land area by 2100 - which corresponds to almost one-and-a-half times the area of all EU countries combined.

"This would severely affect the biodiversity currently found in these regions. The reduction of the negative effects of climate change achieved by the maximum use of bioenergy is not enough to offset this loss of biodiversity."

Limiting climate change has been central to discussions at the recent UN Climate Change Conference in Poland.

The impacts of an expansion in bioenergy cropland are already becoming apparent. In tropical regions, oil-palm plantations are having a detrimental impact on flora and fauna. In temperate areas, the replacement of other crops with maize has negatively affected populations of farmland birds and mammals.

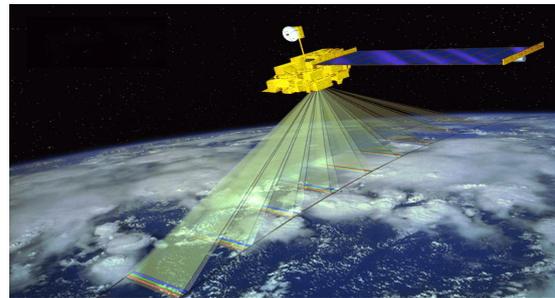
The study is part of the BioScen1point5 project in the programme "Support for an expanded and improved scientific basis for the IPCC special report regarding a global temperature increase by 1.5 °C (SR1.5)," sponsored by the German Federal Ministry of Education and Research.

Satellite remote sensing tools to monitor variations in plant biodiversity ...

GEOSPATIAL WORLD 03-DEC-2018

Satellite remote sensing tools to monitor variations in plant biodiversity in India

India: Dr. PS Roy, former Director of Indian Institute of Remote Sensing and senior scientist NASI explained the crucial role of satellites in monitoring changes in plant biodiversity in India. He apprised the Indian Ocean Rim Association (IORA) about the development of the latest resolution capacity enhancement tools for preparing species-specific remote sensing maps of plants biodiversity in India.



He further informed that topographic details of changing landscapes of plant populations can now be mapped on a real-time scale for taking proactive measures for controlling land and flora degradation in biodiversity-rich areas like Western Ghats.

"IBIN is encouraging all plant research institutes of the country to digitalize their research and development data using internationally approved geospace data languages for their better understanding and cross-talking with other GIS databases on plant bio-resource in the world." stated Dr. Roy

ORGANIC FARMING

"Export price of organic ginger is basically the same as last year"

FRESHPLAZA-04-DEC-2018

"This year, China's organic ginger export season is ongoing. The current export price of organic ginger to the European market is about 1,500 US dollars, basically the same as last year." Jason, sales manager at Tailai Foods Co., Ltd., said in an interview with the Freshplaza.

"The reason why the export price is so stable is mainly because the planting area of organic ginger in China is relatively stable compared with ordinary ginger. The management costs of organic ginger are higher, and compost must be used in the planting process instead of a general fertilizer. Also the average yield of organic ginger is lower than that of ordinary ginger, which is 5-6 tons per mu, only 3-4 tons."



organic ginger is lower than that

In recent years, China's organic ginger has been mainly exported to Europe and the US. In these markets, China's organic ginger has always occupied a solid market share, and only organic ginger from Peru can compete with it."

Organic food worse for the climate?

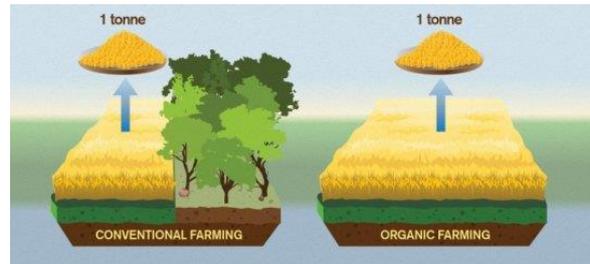
SCIENCE DAILY-13-DEC-2018

Organically farmed food has a bigger climate impact than conventionally farmed food, due to the greater areas of land required, a new study finds.

The crops per hectare are significantly lower in organic farming, which, according to the study, leads to much greater indirect carbon dioxide emissions from deforestation. Although direct emissions from organic agriculture are often lower -- due to less use of fossil energy, among other things -- the overall climate footprint is definitely greater than for conventional farmed foods.

Credit: Yen Strandqvist/Chalmers University of Technology

Organically farmed food has a bigger climate impact than conventionally farmed food, due to the greater areas of land required. This is the finding of a new international study involving Chalmers University of Technology, Sweden, published in the journal Nature.



The researchers developed a new method for assessing the climate impact from land-use, and used this, along with other methods, to compare organic and conventional food production. The results show that organic food can result in much greater emissions.

"Our study shows that organic peas, farmed in Sweden, have around a 50 percent bigger climate impact than conventionally farmed peas. For some foodstuffs, there is an even bigger difference -- for example, with organic Swedish winter wheat the difference is closer to 70 percent," says Stefan Wirsenius, an associate professor from Chalmers, and one of those responsible for the study.

The reason why organic food is so much worse for the climate is that the yields per hectare are much lower, primarily because fertilisers are not used. To produce the same amount of organic food, you therefore need a much bigger area of land.

The ground-breaking aspect of the new study is the conclusion that this difference in land usage results in organic food causing a much larger climate impact.

"The greater land-use in organic farming leads indirectly to higher carbon dioxide emissions, thanks to deforestation," explains Stefan Wirsenius. "The world's food production is governed by international trade, so how we farm in Sweden influences deforestation in the tropics. If we use more land for the same amount of food, we contribute indirectly to bigger deforestation elsewhere in the world."

Even organic meat and dairy products are -- from a climate point of view -- worse than their conventionally produced equivalents, claims Stefan Wirsenius.

"Because organic meat and milk production uses organic feed-stock, it also requires more land than conventional production. This means that the findings on organic wheat and peas in principle also apply to meat and milk products. We have not done any specific calculations on meat and milk, however, and have no concrete examples of this in the article," he explains.

A new metric: Carbon Opportunity Cost

The researchers used a new metric, which they call "Carbon Opportunity Cost," to evaluate the effect of greater land-use contributing to higher carbon dioxide emissions from deforestation. This metric takes into account the amount of carbon that is stored in forests, and thus released as carbon dioxide as an effect of deforestation. The study is among the first in the world to make use of this metric.

"The fact that more land use leads to greater climate impact has not often been taken into account in earlier comparisons between organic and conventional food," says Stefan Wirsenius. "This is a big oversight, because, as our study shows, this effect can be many times bigger than the greenhouse gas effects, which are normally included. It is also serious because today in Sweden, we have politicians whose goal is to increase production of organic food. If that goal is implemented, the climate influence from Swedish food production will probably increase a lot."

So why have earlier studies not taken into account land-use and its relationship to carbon dioxide emissions?

"There are surely many reasons. An important explanation, I think, is simply an earlier lack of good, easily applicable methods for measuring the effect. Our new method of measurement allows us to make broad environmental comparisons, with relative ease," says Stefan Wirsenius.

The results of the study are published in the article "Assessing the efficiency of changes in land use for mitigating climate change" in the journal *Nature*. The article is written by Timothy Searchinger, Princeton University, Stefan Wirsenius, Chalmers University of Technology, Tim Beringer, Humboldt Universität zu Berlin, and Patrice Dumas, Cired.

More on: The consumer perspective

Stefan Wirsenius notes that the findings do not mean that conscientious consumers should simply switch to buying non-organic food. "The type of food is often much more important. For example, eating organic beans or organic chicken is much better for the climate than to eat conventionally produced beef," he says. "Organic food does have several advantages compared with food produced by conventional methods," he continues. "For example, it is better for farm animal welfare. But when it comes to the climate impact, our study shows that organic food is a much worse alternative, in general."

For consumers who want to contribute to the positive aspects of organic food production, without increasing their climate impact, an effective way is to focus instead on the different impacts of different types of meat and vegetables in our diet. Replacing beef and lamb, as well as hard cheeses, with vegetable proteins such as beans, has the biggest effect. Pork, chicken, fish and eggs also have a substantially lower climate impact than beef and lamb.

More on: The conflict between different environmental goals

In organic farming, no fertilisers are used. The goal is to use resources like energy, land and water in a long-term, sustainable way. Crops are primarily nurtured through nutrients present in the soil. The main aims are greater biological diversity and a balance between animal and plant sustainability. Only naturally derived pesticides are used.

The arguments for organic food focus on consumers' health, animal welfare, and different aspects of environmental policy. There is good justification for these arguments, but at the same time, there is a lack of scientific evidence to show that organic food is in general healthier and more environmentally friendly than conventionally farmed food, according to the National Food Administration of Sweden and others. The variation between farms is big, with the interpretation differing depending on what environmental goals one prioritises. At the same time, current analysis methods are unable to fully capture all aspects.

The authors of the study now claim that organically farmed food is worse for the climate, due to bigger land use. For this argument they use statistics from the Swedish Board of Agriculture on the total production in Sweden, and the yields per hectare for organic versus conventional farming for the years 2013-2015.

More on biofuels: "The investment in biofuels increases carbon dioxide emissions"

Today's major investments in biofuels are also harmful to the climate because they require large areas of land suitable for crop cultivation, and thus -- according to the same logic -- increase deforestation globally, the researchers in the same study argue.

For all common biofuels (ethanol from wheat, sugar cane and corn, as well as biodiesel from palm oil, rapeseed and soya), the carbon dioxide cost is greater than the emissions from fossil fuel and diesel, the study shows. Biofuels from waste and by-products do not have this effect, but their potential is small, the researchers say.

All biofuels made from arable crops have such high emissions that they cannot be called climate-smart, according to the researchers, who present the results on biofuels in an op-ed in the Swedish Newspaper Dagens Nyheter: "The investment in biofuels increases carbon dioxide emissions."

ICAR IN PRINT

ICAR has contributed in increasing agriculture production

ECONOMIC TIMES-20-DEC-2018

NEW DELHI: Technologies developed by the Indian Council of Agriculture Research (ICAR) have significantly contributed in increasing agriculture production, said Agriculture minister Radha Mohan Singh.

He said that schemes like - Attracting and Retaining Youth in Agriculture (ARYA) scheme and the student READY (Rural Entrepreneurship Awareness Development Yojana) scheme were proving to be very effective in attracting rural educated youth to agriculture.

Further, the agri-business incubation (ABI) centers were also encouraging new startups, said the minister.

"The ICAR has setup a network of 25 ABI centers, keeping in view the spectrum of technologies available infrastructure and the core competency of the institutes. The efforts of these centers are resulting in new startups which are coming in the market," said Singh while addressing in-session meeting of consultative committee of the Ministry of Agriculture & Farmers' Welfare on agri-entrepreneurship and start-ups for enhancing farmer's income.

The minister said that the technologies developed by the ICAR have significantly contributed to an increase in foodgrain, horticultural crops, milk, fish and eggs production.

"The ICAR has added this dimension in the field of agriculture which will provide employment opportunities to the youth along with income enhancement of the farmers. In this direction, several steps have been taken at different levels including providing training to the farmers at Krishi Vigyan Kendras on various subjects related to agriculture under the Entrepreneurship Development Programs (EDPs) and support with technical resources," he said.



Singh said that the technologies developed by the ICAR have significantly contributed to an increase in foodgrain, horticultural crops, milk, fish and eggs production.

Big Change:
The end of Five-Year Plans: All you need to know

IISR IN PRINT

IISR releases new pest management solutions

THE HINDU-22-DEC-2018

Products to fight diseases affecting cardamom, ginger, black pepper

The Indian Institute of Spices Research (IISR) has come up with three new research products to fight various diseases affecting the production of cardamom, ginger and black pepper in Kerala.

The three products — Lecanicillin-G, Bacillich and Pochonin-L — were released by Trilochan Mohapatra, Secretary of the Department of Agricultural Research and Education and Director General of the Indian Council of Agricultural Research (ICAR), during his visit to the IISR campus on Saturday.



Lecanicillin-G will be available to farmers for the biological control of cardamom thrips.

The field application technology was developed using a naturally occurring entomopathogenic fungus isolated from cardamom thrips and identified as *Lecanicillium psalliotae*.

Scientists associated with the technology say the treatment with the fungus is on a par with synthetic chemical insecticides.

The second product, Bacillich, is useful in controlling bacterial wilt in ginger caused by *Ralstonia pseudosolanacearum*.

The bacteria was isolated from the apoplastic fluid of ginger and identified as *Bacillus licheniformis*. According to scientists, the use of this technology is eco-friendly and very effective in combating bacterial wilt pathogen.

Pochonin-L, a liquid formulation for biocontrol, is effective in preventing root knot which is prevalent in south India's pepper gardens.

Currently they are managed through the application of chemical nematicides.

Fungus attacks

The fungus attacks all stages of nematode egg, parasitizes the eggs and sedentary females.

Scientists with the IISR associated with the research say the development of liquid formulation technology is a huge success.

Provisional patent

The provisional patent application is with the patent office and the technology is ready for commercial application, they add.

IISR gets advanced post harvest processing facility

TNN | DEC 22, 2018, 02.31 PM IST

KOZHIKODE: The Indian Institute of Spices Research (IISR) gets an exclusive building for post-harvest processing of spices and for conducting other research activities. The building was opened by Trilochan Mohapatra, Director General of Indian Council of Agriculture Research (ICAR) at a function on IISR campus at Chelavoor, on Saturday.

The building has advanced facility for post-harvest technology. Though scientists at IISR have been carrying out various post-harvest studies and research activities, the inauguration of a new building will strengthen the activities.

According to scientists with IISR, the processing of harvested spices will be given thrust at the advanced facility. The most suitable method for drying, the time required for drying a particular spice to maintain the quality of the spices and other facts will be researched at the centre, the scientists said.

Quality control of various spices including pepper, turmeric, ginger, nutmeg cinnamon, clove and cardamom will also be studied at the facility. The storage facilities to be used to preserve the medicinal value of the spices and the methods to naturally preserve the dried spices for longer time will also be studied at the centre.

The centre also has the facilities for pesticide residue analysis. The facility will also help exporters and others to understand the content of pesticide in different samples of spices.

The research conducted at the centre will help the farmers improve the quality of their products by changing the method of processing and storage.

IISR sets up post-harvest processing unit in Kerala

THE HINDU BUSINESSLINE-31-DEC-2018

The Indian Institute of Spices Research (IISR) has set up an advanced facility for post-harvest technology at Kozhikode, which is expected to give a significant thrust to research on processing, food safety and value addition in spices.

Inaugurating the facility, Trilochan Mohapatra, Secretary, DARE and Director-General, ICAR, emphasised the need for meticulous crop planning to enhance farm business income from farming of spice crops.

Product development for niche markets, better application of mechanisation and innovative crop management can enhance the returns from spice farming, he said.

Later, addressing a seminar on Fair Agricultural Practices, he urged farmers to explore the potential of integrated farming with maximum diversification to meet the challenges in the sector. Climate change had emerged as a major concern for farmers where researchers can contribute more in the future, he added.

The facility also envisaged to encourage entrepreneurship in the sector by extending an incubation facility to young entrepreneurs and start-ups with the support of the Institute of Technology Management, Business Planning and Development (ITMBPD) at IISR. Besides, the Institute also launched three technologies to fight pest infestation in spice cultivation.

Integrated cultivation need of the hour, farmers told

THE HINDU-22-DEC-2018

Scientist calls for diversification to meet challenges in agriculture

Trilochan Mohapatra, Secretary of the Department of Agricultural Research and Education and Director General of the Indian Council of Agricultural Research (ICAR), has called upon farmers in the State to explore the potential of integrated farming with maximum diversification to meet challenges in the agriculture sector.

Opening a seminar on 'Fair agricultural practices' as part of the launch of the Advanced Facility for Post Harvest Technology at the Indian Institute of Spices Research (IISR) here on Saturday, Mr. Mohapatra, a prominent agricultural scientist, pointed out that the possibilities of combination crops should be tried at all possible fields, and that their export potential for more revenue should be explored.

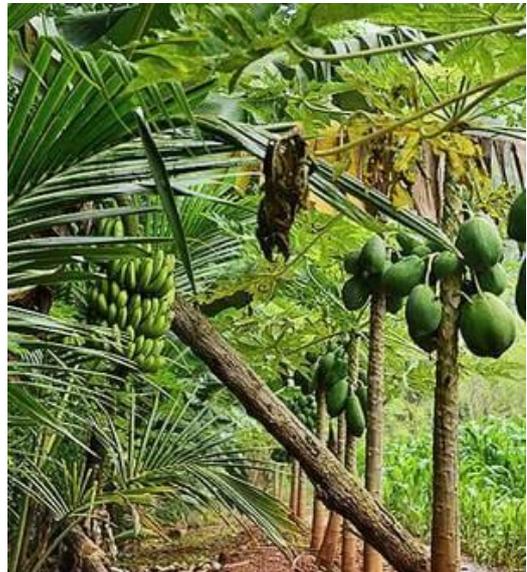
"The Indian agriculture sector has grown to unparalleled heights, and we are not just producers to meet our own demands now. For a majority of farmers, export is a source of steady revenue to flourish," said Mr. Mohapatra. He added that research and inventions by agricultural scientists were opening doors to such a coverable progress in the country in terms of increased agricultural production and marketing.

"The only challenge now is the yet-to-be proportionate growth in revenue for farmers despite a rise in production. It is a problem of plenty which we can survive with better planning and marketing strategies," he pointed out.

According to him, focus should be laid on efforts to make farming lucrative with newer marketing strategies.

Speaking on research activities taken up by ICAR, Mr. Mohapatra said climate change had emerged as a major concern for farmers where researchers can contribute more in the future.

"The development and supply of seed varieties with strong resistance to unexpected climate changes continue to be a major area of research, and we have plenty of such newly developed plant varieties to support farmers," he said.



Support for farmers

On the Centre's move to equip all research organisations better with the most effective tools for farmers, Mr. Mohapatra said one of the priority areas while facing unexpected challenges was the development of seed farms with public-private partnership. "In the case of Kerala where the floods hit farmers' livelihood, the department had made all possible efforts to supply them with the required quality seeds and plants to venture again with confidence. We also initiated an impact study in the State to offer suggestions on addressing farmers' concerns," he said.

ICAR Deputy Director General (Horticultural Science) Anand Kumar Singh, Assistant Director General T. Janakiram, and IISR Director Nirmal Babu were present at the function.

Three latest technologies developed by IISR to fight pest infestation in spice cultivation were launched on the occasion. This was in addition to the formal launch of four start-ups based on spice products with the support of the Institute of Technology Management, Business Planning and Development (ITM BPD) at IISR.

Kozhikode farmers attend two-day bee keeping training

TIMES OF INDIA-02-JAN-2019

The training session, which concluded on Wednesday, was organised to encourage young people to set up own ventures in bee keeping.

The training was organised under the supervision of Dr KK Aiswarya, subject matter specialist, KVK with theory class on kinds of bees, uses of honey and making of value-added products from it. Sethukumar of HORTICORP took practical sessions on bee identification, cells classification, super box maintenance and handling, honey extraction and processing.

The participants were also shown bee hives, honey extractor, mask and other small apparatus used in honey production.



KOZHICODE: A two-day bee keeping training class was organised by the Krishi Vigyan Kendra (KVK), Indian Institute of Spices Research (IISR).

GENERAL

Indian farmer 'remarkably adaptable' to innovation, says President Kovind

THE TRIBUNE-01-DEC-2018

President Ram Nath Kovind praised farmers on Saturday, saying they have proven to be "remarkably adaptable" to innovation and bold in taking risk, which has helped India become an exporter of key agricultural and allied products.

Speaking after inaugurating the 13th edition of CII Agro Tech India-2018 in Chandigarh, which was attended by 195 exhibitors, including 37 from outside India, Kovind said the Indian farmer has been courageous in converting risk into opportunity. He also called for boosting investments, including from private players, in agricultural research & development.

The President's remarks come a day after Opposition leaders rallied behind thousands of farmers from across the country who had gathered in the National Capital demanding remunerative prices for their produce and government relief from debt.

The farmers, battling severe agrarian distress, had started to converge in Delhi on Thursday, stayed at the historic Ramlila Maidan overnight and on Friday morning, they marched through streets shouting slogans to highlight their plight.

Kovind said the government is working towards greater efficiency in agricultural markets, which will give farmers access to a wider customer base and allow them to get better prices.

He outlined several government initiatives — such as Pradhan Mantri Krishi Sinchai Yojana and Pradhan Mantri Fasal Bima Yojana — to improve the condition of farmers.

The President said the irrigation scheme has covered about one million hectares and the crop insurance scheme has provided a safety net to nearly 25 million farmers.

"These are only a start. In the years to come, we have to cover more farmers and more farm land," he added.

Complementing farmers, Kovind said, "The Indian farmer has proven to be remarkably adaptable — unafraid of innovation, new techniques and scientific inputs." "As a result India has emerged as an exporter of key agricultural and allied products such as rice, marine products, fruits, vegetables and even flowers. Our farmers supply commercial



President Ram Nath Kovind inaugurates CII Agro Tech India 2018 exhibition, in Chandigarh on Saturday. Tribune photo: Manoj Mahajan

crops like cotton to the rest of the world." He, however, said the challenge now is to scale up.

"Indian agriculture needs a renewal of its marriage with contemporary technology, protection against climate change, price fluctuations and demand shocks; and sustained investment by and partnership with business.

"Together these will enhance agricultural value and competitiveness — as well as lead to better incomes," he said.

The National Agricultural Market or eNAM, an online platform for buying and selling agricultural commodities, has linked farmers, traders and buyers across India, he said.

The selfless efforts of farmers have contributed to national development and to the wellbeing of people, he said.

"Initiatives such as the Green Revolution — which was carried out with such determination in Punjab, Haryana and neighbouring states — have helped convert a country of chronic food shortages and imports to a food surplus economy. This was possible due to visionary policy makers, ingenious agricultural scientists — and above all, farmers who gave their sweat and toil," the president said.

He said public-private partnerships in agriculture have the potential to modernise the sector.

"PPPs can be instrumental in developing agricultural value chains, conducting joint research that focuses on innovation, building market infrastructure, and delivering business development services to farmers," Kovind said.

The President also touched upon stubble-burning by farmers, saying all stakeholders should come up with a solution.

"We are facing a problem related to disposal of crop residue and of safe and clean removal of husk or stubble. In an extreme form, the burning of such items is leading to pollution that affects even little children. "It is for all of us, including the state governments, the skilled and large-hearted farmers, and other stakeholders, to come up with a solution," he said.

Stubble-burning in some northern states pushes air pollution to dangerous levels. During winters, Delhi is covered under a thick blanket of toxic smog for several days.

On Saturday, however, the contribution of long-range dust or stubble biomass to air pollution in Delhi was negligible, the Centre-run System of Air Quality and Weather Forecasting said.

President Kovind also stressed that the link between agriculture and industry must be strengthened for a seamless value chain and minimal wastage.

"To this end, 42 mega food parks are being set up and 228 integrated cold chain projects are underway in different parts of India," he said.

Punjab Governor and Chandigarh Administrator V P Singh Badnore, Haryana Governor Satyadev Narayan Arya, Haryana Chief Minister M L Khattar, Union Agriculture Minister Radha Mohan Singh, Union Food Processing Minister Harsimrat Kaur Badal, CII president Rakesh Bharti Mittal were present at the event. PTI

How to Avoid Lead Exposure from Spices

HEALTHLINE-13-DEC-2018

A new study found lead was in more than 50 percent of spice samples.

Naturally occurring lead can impact the safety of spices. Spices are often hailed as a healthy way to prevent adding excessive salt or fats to flavor meals.

But a new report found some spices can potentially cause health problems through lead exposure.

The study, which was published in the Journal of Public Health Management and Practice, examined lead poisoning cases related to spices purchased abroad and sheds light on how to ensure your spices are safe to consume.

Paromita Hore, PhD, MPH, and colleagues at the New York City Department of Health and Mental Hygiene investigated consumer products with regard to lead exposure. They tested more than 3,000 products between 2008 and 2017.

The team found that spices purchased overseas were most at risk of leading to lead exposure.

The items were part of lead poisoning cases and local store surveys. Spices were most recently tested, with about 1,500 samples from 41 countries examined.

Lead was detected in more than half of the spice samples. More than 30 percent had lead concentrations greater than 2 parts per million (ppm), which is the allowable limit for lead in certain food additives.

Spices purchased overseas had higher lead content levels compared to those purchased in the United States.

When purchased domestically, turmeric and Georgian kharcho suneli bought in New York City had average lead concentrations below 2 ppm. But those same spices purchased overseas had average concentrations exceeding 50 ppm.

Spices bought in Georgia, Pakistan, Bangladesh, Nepal, and Morocco had the highest lead concentrations. Most of the contaminated spices were in unmarked containers that didn't show brand name information.

The highest lead levels were found in the Georgian spice kviteli kvavili, or yellow flower. Examples of other contaminated spices purchased abroad included turmeric, hot pepper, chili powder, and paprika.

The authors say public health professionals and medical providers should also be aware that spices could be a risk factor of lead exposure and screen populations at risk.

Get the lead out

The problem of lead exposure from spices is nothing new. Studies have been conducted in the past about contamination. A study out last year named turmeric a spice of concern, citing a 2011 recall of the spice.

In May of this year, the U.S Food and Drug Administration (FDA) issued an import alert stating ports could detain shipments from certain importers. They targeted turmeric from India and Bangladesh.

“Based on what the data are showing us so far, buying spices in the U.S. instead of online or when traveling overseas seems to be a good way to protect yourself, because the spices that have been legally imported into the U.S. at least have the chance of going through heavy metal screening upon import,” said Kim Gaetz, a public health epidemiologist based in North Carolina.

“Almost all spices are imported, but the lead levels seem to be highest in those that were actually purchased outside of the U.S.,” Gaetz added.

How black cardamom curbs sweetness to induce satiety (and guards ...

DAILY0-21-DEC-2018

Black cardamom’s smoke is a shadow to dim over-indulgence.

Strong spices have plural personalities. Clove’s structure is medicinal and antiseptic, though its top note is warmth. White pepper is sandalwood coal smoulder, dressed in herbaceous floral.

Black cardamom is amorphous sexy smoke — wrapped around integrity.

Two contrarian notes: Black cardamom is sexy smoke. And pure integrity.
(Photo: Miansari66/Wikimedia Commons)

I was born hungry. My dad repeatedly instructed me throughout my girlhood on the moral and spiritual value of nurturing life’s endeavours without thought to reward.

“Plant the seed, water the seed and nurture the seed without thinking of the fruit you might harvest from the tree,” was the general story.

I didn’t indulge his instruction for a minute. The aroma of success was an intoxicant and I breathed it in. And yet, even when the big wins did come, I was rarely satisfied for very long.



When I think of satiety, I think of pleasure, deeply felt and consciously realised. Last night, my husband cooked a simple Southern Hemisphere summer meal of pasta, pesto, corn and tuna for our two sons. Sweet and light.

Knowing my hunger went deeper than surface, I split a head of cauliflower onto a cooking tray and slid it into a hot oven. Once charred, I threw the lot into a pan hot with ghee, chilli, salt and nigella seed. Ground coriander for texture. Jaggery for sweetness. And last? Black cardamom.

Two wizened pods for rich and smoky depth.

When I hold a katori of black cardamom to my nose, I'm seduced by the olfactory intoxication of sweet char — an intense bonfire blaze of aroma. Try it. Hold the pods close and breathe in deeply. Then breathe in again. Harder. Smell the hot steel beneath the smoke.

This provision of substance in the experience of pleasure is what produces satiety. Black cardamom is a key element to creating a whole and satisfying flavour because of the structure behind its forward, charry warmth.

In my pans, black cardamom is the texture that gives heft and chew to lighter, sweeter spices, darkening and deepening the high-note moreish nature of acids and sugars with its shadow.

In my life, it's the morning kiss of my husband interrupted by our sons' waking, but whose love behind the interrupted act carries me joyously into the day anyway.

This spice was the star in Dad's salan-wale chawal, a contrast to sweet mutton and fragrant rice. Every time he made it, I'd be sure to bite down on one of those whole pods and — whoosh — instantly, my appetite would vanish.

I don't want my appetite for pleasure to vanish, but I do sometimes want to know how to curb it.

This is what black cardamom teaches.

I use black cardamom when I want to find a peaceful way to step back from the temptation of over-indulgence. Black cardamom and pistachio in a cake means a small piece is gratifying. A single pod in my Spaghetti Bolognese finds me satisfied with a less that feels on my palate as more.

Those two wizened pods in last night's gobi sabzi allowed a katori of food to fill a hole of need that a plateful of pesto and sweetcorn spaghetti would have failed to touch.

I have found the discipline of giving structure to pleasure both incredibly satisfying and occasionally painful. Sometimes, it doesn't make sense to me to throttle back and be in the moment when it feels like there is so much out there to grasp. Then I cook again with black cardamom and taste the reward of focus.



Black cardamom is dark, deep, pure wisdom. (Photo: Twitter)



Want to know how to not overeat this? Simple — just add a pod of black cardamom!

For those of us to whom food and spice matters, how we choose to use it is powerfully instructive.

And so I use black cardamom to remind myself the amorphous smoke of pleasure is only ever satisfying when it has integrity to wrap around.

Seduction falls short when unsupported. The spine of satiety is substance.

Suresh Prabhu distributes awards of Excellence in export of Spices ...

ALL INDIA RADIO-08-DEC-2018

Suresh Prabhu distributes awards of Excellence in export of Spices & Productivity of Cardamom instituted by Spices Board

NSD Logo

Union Minister Suresh Prabhu distributed awards of Excellence in export of Spices and Productivity of Cardamom instituted by Spices Board at Kochi today. He also laid foundation stone of Zero Liquid Discharge Plant and Solar Plant for Cochin Special Economic Zone at the same function.

Speaking on the occasion, Mr Prabhu said, the government will provide full support to farmers to enhance the exports in this sector and stressed the need to increase the production and ensure the quality of the products.

The Minister said, the government will ease the restrictions in the export of agricultural products and recently announced agricultural export policy has helped the country to increase the exports by twenty per cent.

He also announced that the government will take steps to help the affected farmers in this sector in recent floods in Kerala.

Meet 5 startups that are helping farmers with new-age and innovative

YOURSTORY.COM-20-DEC-2018

Be it reducing the use of fertilisers or using a nano nutrient to boost crop production, these startups are innovating to resolve problems faced by farmers.

The agriculture sector is the backbone of India's economy, but agrarian distress continues to haunt farmers across the country. Favourable government policies notwithstanding, farmers also need innovative solutions to age-old problems.



A two-day event, Innovate 2 Cultivate, was held in Coimbatore by Marico Innovation Foundation on December 4 and 5. As many as 23 entrepreneurs (present out of 37 cohort members) from across the country were present at the event, which focussed on startups bringing agri-innovations to scale.

Even as the convergence of mobile networks, broadband internet, cloud platforms, IoT, AI and open data is transforming agriculture in India, we focus on five startups that are innovating to address farmers' issues.

Distinct Horizons

Hyderabad-based Distinct Horizons has developed a machine that helps in reducing excess use of fertilisers by 30-40 percent. The machine, which uses the Urea Deep Placement (UDP) technique, claims to have increased productivity by 25 percent for over 450+ farmers.

Ayush Nigam with his product, Co-founder of Distinct Horizons

The UDP machine applicator is not directly sold to farmers; it is expensive - priced at Rs 1.5 lakhs - and is rented out. Ayush Nigam, Co-founder of Distinct Horizons, says,

We rent it for between Rs 800 and Rs 1,500 per acre, and mostly approach influential farmers of the region so others would also trust and use it.



Ayush explains that fertilisers mostly end up on weeds; only a fraction of the fertiliser is applied for the benefit of the plants. "With our machine, the fertilisers are channelled directly to the roots of the plants, minimising use."

The machine was launched in 2015 and has helped farmers across villages in Uttar Pradesh and Andhra Pradesh till now.

Impeccable Innovation

Arnab Guha, Founder of Impeccable Innovations

Bengaluru-based Impeccable Innovations uses a "nano nutrient" to enhance the efficiency of photosynthesis and boost crop production. Founder Arnab Guha says, the nano nutrient - Nualgi - comprises 12 nutrients and is applied to leaves to boost the photosynthesis process.

Arnab explains,

The product has nutrients such as iron, manganese, molybdenum, boron, cobalt, and zinc to name a few. All these nutrients disperse into nano form and can be easily absorbed by the stomata due to their small size. This package of nutrients, when delivered to chlorophyll, boosts photosynthesis.

Nualgi has been developed by Bengaluru-based Nualgi Nanobiotech, and Impeccable Innovations is the technical channel marketing partner. According to Arnab, it leads to 10-15 percent improvement in yield in cases of crops like wheat and rice, and 30 percent improvement in mustard.

The nano nutrient also helps reduce farmers' spending as it minimises the need of any fertilisers. Arnab says a farmer who used to spend Rs 10,000 on inputs can save up to Rs 3,000. The product has benefited 1,000 farmers in rural areas of Karnataka so far.

Occipital Tech

This Mumbai-based startup offers an AI-based vision system to grade and sort fruits and vegetables based on size, colour, shape and surface quality. Founded by Kshitij Thakur and Vinayak Ghosale with Nikhil Pandey as a team member, the startup aims to provide uniform and continuous quality checks for every product in real-time.

Kshitij Thakur, Chief Operating Officer with Vinayak Ghosale, Co-founder of Occipital Tech

Kshitij Thakur, Chief Operating Officer of Occipital Tech, says,

We aim to bring current costs down from the present price. With our technology, the accuracy is 98 percent, and it takes one-fifth of the time required in the manual process used now.



When asked on the market status, Kshitij explains, "We started by interviewing over 20 agribusinesses including exporters, FPOs and food processing companies to identify the problem statement of grading and sorting in fruits and vegetables."

Vise Organic

Gujarat-based Vise Organic aims to reduce chemical consumption in the agricultural sector to ensure a greener future. Most farmers desist from adopting organic farming techniques due to the initial costs involved. Vise Organic, founded by Prakash Vaghasiya in 2017, offers a range of products that can help reduce costs for farmers. The product lineup includes pesticides, growth promoters, and fertilisers.

It also offers MyLab, an innovative product that allows low-cost production of bio-fertilisers and bio-pesticides by farmers.

Prakash says,

With the help of the MyLab machine, a farmer can also start his own business in providing low-cost biofertilisers and sell them for Rs 80 per litre. If a farmer buys biofertiliser from the market, it costs around Rs 300 per litre, and can be used on an acre of land. The MyLab kit lets you produce it at Rs 50 per litre and can be used over 10 acres.



Prakash Vaghasiya, founder Vise Organic (right) and the MyLab product(left)

Vasumitra

To shift from agrochemical-based farming, farmers need a potential alternative that can enhance overall productivity at a minimal cost. Pune-based Vasumitra develops agriculture inputs suitable for organic agriculture.

We are helping farmers in sustainable organic farming and have reduced cultivation costs by 15-20 percent. Also, there has been an improvement in yield and product quality, and we can help weed out over 60-70 percent of agro-chemicals used by the farmers.

In six years, Vasumitra claims to have successfully impacted 21,000 acres of land spread across 16 districts in three states. With the help of its 28 products across four categories, including Carbon-Rich Fertilisers, Physiological Triggers, Crop Protection, and Ionic Fertilisers, farmers find it convenient and cost-effective to adopt organic agriculture.



Bhushan Jambhelkar (Right), CEO of Vasumitra and farming products (left)

'Kisan Suvidha' mobile app to alert farmers on critical parameters

KASHMIR READER-18-DEC-2018

NEW DELHI: Minister of State for Ministry of Agriculture & Farmers Welfare Parshottam Rupala on Wednesday said the Department of Agriculture, Cooperation and Farmers Welfare has developed Kisan Suvidha mobile application to facilitate dissemination of information to farmers on the critical parameters viz., weather, market prices, plant protection, agro-advisory, extreme weather alerts, dealers–seed, pesticide, fertiliser, farm machinery, soil health card, cold storages & godowns, veterinary centres and diagnostic labs.

“Farmers can download Kisan Suvidha app through Google Play Store and mkisan.gov.in, to access all the information free of cost. The Indian Council of Agricultural Research (ICAR) has also compiled more than 100 mobile apps developed by ICAR, State Agricultural Universities (SAUs) and Krishi Vigyan Kendras and uploaded on its website. These mobile apps have been developed in the areas of crops, horticulture, veterinary, dairy, poultry, fisheries, natural resource management and integrated subjects. These apps offers valuable information to the farmers, including package of practices, market prices of various commodities, weather related information, advisory services, etc.,” an official release read.

Farmers can get information on farm subsidies, dealers of seed, pesticide, fertilizer, farm machinery, crop insurance and subsidies under various schemes through main portal of the Department of Agriculture, Cooperation and Farmers Welfare i.e. agricoop.gov.in and Farmers’ portal i.e. <https://farmer.gov.in/>.

Farmers’ portal provides information on all agriculture related areas through a single umbrella. Farmers can also get scheme-wise information from the portals of the submission on agriculture mechanisation (<https://farmech.dac.gov.in/>), Mission for Integrated Development of Horticulture (<https://midh.gov.in/>), Pradhan Mantri Krishi Sinchayee Yojana (<https://pmksy.gov.in/>); Pradhan Mantri Fasal Bima Yojana

(<https://pmfby.gov.in/>); Soil Health Card Scheme (<https://soilhealth.dac.gov.in/>); National Mission on Oilseeds and Oil Palm (<https://nmoop.gov.in/>); National Bank for Agriculture and Rural Development; (<https://www.nabard.org/content.aspx?id=602>); National Mission For Sustainable Agriculture (<https://nmsa.dac.gov.in/>); etc. “No data about systems developed by the states for dissemination of information is maintained centrally. However, as per information provided by some states, Haryana, Rajasthan, Andhra Pradesh, Telangana, Tamil Nadu and Meghalaya have developed portals to disseminate information, inter-alia, about schemes relating to farmers,” he added.

'Bring smallholders to centre of agri research'

THE HINDU BUSINESSLINE-10-DEC-2018

Our Bureau Agriculture should not be seen as a cause, but as a solution to problems. The country should reorient its agricultural research to focus on the challenges of smallholder farmers, according to RS Paroda, Chairman of Trust for Advancement of Agricultural Sciences (TAAS) and a former Director-General of Indian Council of Agricultural Research.

Delivering the second convocation of Prof Jayashankar Telangana State Agricultural University (PJ TSAU) on Sunday, he said lack of access to new technologies, escalating costs, market volatility and the effects of climate change have led to the decline in yields and farm income.

“These factors are making agriculture both non-profitable and unattractive,” he said.

“We must make sure that smallholder farmers are at the heart of all our efforts. We need to develop food systems that produce more food but with fewer resources,” he said.

The university presented Paroda with a Doctor of Science degree in recognition of his contribution to agriculture and allied sectors.

Post-harvest losses

On average, post-harvest losses are reported to be 4-6 per cent in foodgrains and 12-15 per cent in fruits and vegetables. “The challenge is to minimise such losses and provide options to farmers for value addition for higher income,” he said.

This actually provided a good scope for employment generation in the agricultural processing sector. In the developed countries, it is estimated that up to 14 per cent of the total workforce is engaged in agro-processing sector directly or indirectly.

“But we have only 3 per cent of the workforce engaged in this sector now. This actually is a vast untapped potential for employment generation,” he said.

MS Swaminathan calls GM crops a failure; Centre's adviser faults paper

THE HINDU-07-DEC-2018

Genetically engineered Bt cotton has failed to provide livelihood security for farmers, says article.

A research paper co-authored by leading agriculture scientist M.S. Swaminathan, which describes Bt cotton as a 'failure,' was criticised by India's Principal Scientific Adviser (PSA), K. VijayRaghavan as 'deeply flawed'.

The paper, 'Modern Technologies for Sustainable Food and Nutrition Security', appears in the latest issue of the peer-reviewed journal Current Science. It is authored by P.C. Kesavan and Prof. Swaminathan, senior functionaries of the M.S. Swaminathan Research Foundation (MSSRF). The article is a review of crop development in India and transgenic crops — particularly Bt cotton, the stalled Bt brinjal as well as DMH-11, a transgenic mustard hybrid. The latter two have been cleared by scientific regulators but not by the Centre.

"There is no doubt that GE (genetically engineered) Bt cotton has failed in India. It has failed as a sustainable agriculture technology and has, therefore, also failed to provide livelihood security for cotton farmers who are mainly resource-poor, small and marginal farmers," according to the paper, "...The precautionary principle (PP) has been done away with and no science-based and rigorous biosafety protocols and evaluation of GM crops are in place."

'Flawed and full of errors'

The piece also raises questions on the genetic engineering technology itself on the grounds that it raises the cost of sowing. Also, the insertion of foreign genes (in the plant) could lead to "molecular and cellular events not precisely understood."

<h2>Not sustainable</h2> <p>Arguments raised by P.C. Kesavan and M. S. Swaminathan in their paper:</p>			<h2>THE CONTEXT</h2>
<ul style="list-style-type: none"> ▪ Mutations and natural selection are the predominant evolutionary mechanisms to induce variations in flowering plants ▪ In r-DNA technology (Genetic Engineering or GE) all the molecular and cellular events which are triggered with the insertion of 'exogenous DNA', are not precisely understood ▪ Since cost of GE seeds and inputs as in Bt Cotton are exorbitant, small farmers are unable to withstand crop losses ▪ The site of a gene's insertion is not controllable, and health concerns from unintended effects 	<p>have been raised</p> <ul style="list-style-type: none"> ▪ Precautionary principle has been done away with in India and no rigorous biosafety protocols and evaluation of GM crops are in place ▪ Bt cotton in India failed to live up to promises in 10 years, on high yields from 	<p>pest resistance and reduction in insecticide use</p> <ul style="list-style-type: none"> ▪ Huge socio-economic cost is borne by farmers from hybrids in Bt cotton ▪ Bt cotton farmers are asked to revert to traditional pest management, displaying failure of Bollgard II cotton 	<ul style="list-style-type: none"> ▪ Bt cotton occupies greater than 95% of India's cotton acreage ▪ Yields have stagnated at around 500 kg/ha (lower than yields in China and Egypt) ▪ Bt Brinjal was cleared by the Genetic Engineering Appraisal Committee but was put on a moratorium by the UPA government ▪ DMH-11, or GE mustard developed by Delhi University was cleared by the GEAC, but later it was withdrawn

"The Kesavan and Swaminathan 'Review' (sic) is deeply flawed and full of errors. Needs scientific rebuttal," Mr. VijayRaghavan tweeted from his personal account. Before being

appointed the PSA, Mr. VijayRaghavan, a biologist, was Secretary, Department of Biotechnology, which funds a variety of molecular biology projects. Mr. Kesavan, who is the lead author of the piece, told The Hindu that he was unaware of Mr. VijayRaghavan's comment but was expecting a "scientific, point-by-point response (of any flaws)."

"I'm not on Twitter but I believe a senior scientist shouldn't be making such irresponsible comments," he said.

The Hindu reached out to Prof. Swaminathan's office and was told that the paper had raked up "a lot of controversy."

"We'll likely soon be holding a press conference or a discussion on some of the points raised since the paper was published," a spokesperson for the MSSRF said.

Mr. VijayRaghavan said in a text message that he wouldn't be immediately elaborating on his criticism but would in a "few days."

'Last resort'

Prof. Swaminathan, credited with leading India's Green Revolution, has in recent years advocated 'sustainable agriculture' and said the government should only use genetic engineering as a last resort. "...Swaminathan emphasised that genetic engineering technology is supplementary and must be needbased. Only in very rare circumstance (less than 1%) may there arise a need for the use of this technology," according to the paper.

However, the MSSRF is also involved in GE research. It has a programme on developing drought-resistant GM rice by using genes from mangroves to potentially protect rice varieties grown along the coasts from being affected by higher saline content — a consequence of warming seas from climate change. "The programme is ongoing but isn't aimed for the present. Genes from salt-tolerant plants too aren't ideal...however, GE may be deployed to manage against abiotic stresses," said Mr. Kesavan. Abiotic stresses refer to environmental factors that could meddle with plant yield, as opposed to 'biotic' stressors such as insects. Conventional GE technology uses genes from soil bacterium to either protect them from specific pests, or — as in the case of GE mustard — facilitate hybridisation. This means making the plant more amenable to developing higher-yielding varieties.

Spices, seafood exports set to boost Kerala agri sector: Experts

THE HINDU BUSINESSLINE-18-DEC-2018

Kerala's agriculture sector is poised for a strong growth on the back of rising exports of spices and seafood, coupled with a new energy provided by start-ups in the sector, said experts at CII's Kerala Food Summit.



India's natural food processing and macro-economic advantage, coupled with other growth drivers such as urbanisation, a rapidly growing

middle-class population and rising digital influences on consumers will trigger strong growth in the food processing and food retail segments, they said.

Benefit for farmers

“We should deliberate on how the benefits of the growth in the industry can benefit farmers who are constantly witnessing a drop in commodity prices,” said Agriculture Minister VS Sunil Kumar in his inaugural address.

A holistic effort focussing on branding the indigenous varieties of agricultural produce found in the region and deriving more value-added items should be a top priority, he added.

“I am confident that Kerala can emerge as a strong force in the food processing and exports,” he said.

Bright prospects

The significance of the food industry is that it creates jobs, mobilises resources from the rural sector, promotes agricultural production, adds value to farm produce, tackles rural-urban migration and promotes industrialisation in an agricultural economy, said CII Kerala Chairman S Sajikumar.

According to Navas M Meeran, CII Southern Region Past Chairman, rising exports of spices and seafood underlined Kerala’s strengths in the food sector. The agriculture and allied sectors contributed more than 10 per cent of Kerala’s gross state domestic product (GSDP).

The food sector is already attracting start-ups, and there are immense opportunities for enterprising start-ups to fill the gaps in the existing food sector value chain and thereby transform the food processing economy of Kerala and India, he said.

Food processing

The food processing sector in the State is now taking the benefit of the infrastructure available and a series of processing clusters point to this trend.

Some of the major food processing clusters are rice processing in Preumbavoor, Idukki and Kollam; cashew processing in Kollam, Thiruvananthapuram and Ernakulam ; seafood processing in Alappuzha, and spices processing in Ernakulam, Thiurvananthapuram, Thrissur and Kollam.

MALAYALAM NEWS

മണ്ണില്ലാതെ കൃഷി ചെയ്യാം: മഞ്ഞള് പൂഴുങ്ങാം.. ഇതാ ഇവിടെ

ONEINDIA MALAYALAM-23-DEC-2018

കോഴിക്കോട്: അത്യുപരി സാങ്കേതിക വിദ്യയിലൂടെ ഉല്പാദിപ്പിച്ച സുഗന്ധവിളകളുടെ പ്രദർശനമൊരുക്കി കോഴിക്കോട് കേന്ദ്ര സുഗന്ധവിള ഗവേഷണ കേന്ദ്രം. ഇന്ത്യയുടെ വിവിധ ഭാഗങ്ങളില്നിന്നു കൊണ്ടുവന്ന മഞ്ഞള്, ഇഞ്ചി, കുരുമുളക്, ഏലം, ഉലുവ, മല്ലി, തുടങ്ങിയ സുഗന്ധവിളയുടെ വിശാലമായ പ്രദർശനമാണ് ഒരുക്കിയിരിക്കുന്നത്. മണ്ണില്ലാതെ കൃഷി ചെയ്യുന്ന അക്വപോണിക് വിദ്യയും മഞ്ഞള് പൂഴുങ്ങുന്നതിനുള്ള ബോയിലിംഗ് യൂണിറ്റ് പ്രവർത്തനവുമെല്ലാം പ്രദർശനത്തില് ഇടം നേടി. കാർഷിക ഉല്പങ്ങള് ഉപയോഗിച്ചുള്ള ഭക്ഷ്യവസ്തുക്കളും സുഗന്ധവസ്തുക്കളും കാണാൻ സന്ദർശകരുടെ തിരക്കാണ്. തികച്ചും



ജൈവരീതിയില് സാങ്കേതികവിദ്യയുടെ സഹായത്തോടെ ഉല്പാദിപ്പിക്കുന്ന മികച്ച ഉല്പന്നങ്ങളാണ് പ്രദർശനത്തിലുള്ളത്. മികച്ച ശാസ്ത്രജ്ഞരുടെ നിരീക്ഷണത്തില് വികസിപ്പിച്ചെടുത്ത സുഗന്ധവിളകളും അവ സംസ്കരിച്ചെടുത്ത മുല്യവർദ്ധിത ഉല്പങ്ങളുമാണ് പ്രദർശനത്തിന്റെ മറ്റൊരു പ്രത്യേകത. turmeric-1 സുഗന്ധവിള ഗവേഷണ കേന്ദ്രത്തില് പുതുതായി നിർമ്മിച്ച പോസ്റ്റ്-ഹാർവെസ്റ്റ് ടെക്നോളജി ഗുണനിലവാരമുള്ള സുഗന്ധവിളകള് വിപണനം ചെയ്യാനുള്ള കാല്വെപ്പാണ്. കെട്ടിടത്തിന്റെ ഉദ്ഘാടനം കൗൺസില് ഓഫ് അഗ്രികള്ച്ചറല് റിസർച്ചിന്റെയും ഇന്ത്യൻ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് അഗ്രികള്ച്ചറല് റിസർച്ചിന്റെയും ഡയറക്ടർ ജനറല് ഡോ. ത്രിലോചന് മഹാപത്ര നിർവഹിച്ചു. വിളവെടുപ്പിന് ശേഷമുള്ള ഗുണനിലവാര പരിശോധന, കീടനാശിനികളുടെ അംശം പരിശോധിക്കുക തുടങ്ങിയവയാണ് പ്രധാനമായും പുതിയ കെട്ടിടത്തിലെ ലാബില് നടക്കുക. കുരുമുളക്, ഇഞ്ചി, മഞ്ഞള്, ജാതിക്ക എന്നീ സുഗന്ധവിളകളുടെ പരിശോധന എന്നിവയും കീടനാശിനി പരിശോധന ലാബില് നടക്കും. വിളവെടുത്ത

സുഗന്ധവിളയിൽ അടങ്ങിയിരിക്കുന്ന ജലാംശം, എണ്ണയുടെ അംശം, ഫൈബർ, കൊഴുപ്പ്, തുടങ്ങിയ ഗുണങ്ങളെ പരിശോധിക്കാനും ശുചീകരണം, ഗ്രേഡിംഗ്, പൊടിക്കൽ തുടങ്ങിയ പ്രവർത്തനങ്ങളെ നടത്താനുമുള്ള സൗകര്യങ്ങളെ ഒരുക്കിയിട്ടുണ്ട്. കൂടാതെ വെള്ള കുരുമുളകിന്റെ ഉല്പാദനം, കനിമസാലകളുടെ ഉല്പാദനം , പുതിയ സംരഭങ്ങളെ തുടങ്ങാനുള്ള വിവിധ സഹായങ്ങളെ എന്നിവയും പോസ്റ്റ്-ഹാർവെസ്റ്റ് കേന്ദ്രത്തിൽ ഉണ്ട്. സുഗന്ധവിളകളുടെ മികച്ച വിപണി കണ്ടെത്താനും ഉല്പാദനം വർദ്ധിപ്പിക്കാനും പുത്തൻ കാൽവെപ്പ് സഹായകമാവുമെന്ന് പ്രിൻസിപ്പൽ സൈന്റിസ്റ്റ് ഡോ. ഇ. ജയശ്രീ പറഞ്ഞു. രണ്ട് കോടിയിലേറെ രൂപ ചെലവഴിച്ചാണ് കെട്ടിടവും മറ്റ് സൗകര്യങ്ങളും ഒരുക്കിയത്.

കുരുമുളകിന്റെ ശത്രു മീലിമുട്ട

മാതൃഭൂമി-26-DEC-2018

ദ്രുതവാദ്യവും നിമാവിര ബാധയുമെല്ലാം പിറകിലാക്കിക്കൊണ്ട് കുരുമുളകിന് ഒരു പുതിയ ശത്രു. അതാണ് മീലിമുട്ട. പോയ വർഷങ്ങളിൽ ചെറിയ തോതിൽ നീരുറ്റി കൂടിച്ച മീലിമുട്ട പ്രളയാന്തരമുണ്ടായ വേനലിൽ വൻതോതിൽ ആക്രമണം അഴിച്ചു വിട്ടിരിക്കുകയാണ്. വേരിൽ നിന്നും വള്ളിയുടെ മണ്ണിനോട് ചേർന്നു വരുന്ന ഭാഗത്തുനിന്നും നീരുറ്റി കൂടിക്കുന്നതാണ് മീലിമുട്ടയുടെ പ്രധാന തൊഴിൽ. കുരുമുളകു വള്ളിയുടെ മുകൾ ഭാഗത്തേ ഇലകൾ വിളർച്ച ബാധിച്ച് മഞ്ഞളിക്കുന്നു. ഈ മഞ്ഞളിപ്പ് ക്രമേണ വള്ളി മുഴുവൻ പടരും. ഒപ്പം വള്ളി വാടി ഉണങ്ങുന്നു.



വയനാട്, ഇടുക്കി, കണ്ണൂർ, കാസർഗോഡ് ജില്ലകളിലെ മലയോര പ്രദേശങ്ങളിലാണ് മീലിമുട്ടയുടെ ആക്രമണം കൂടുതലായി കാണുന്നത്. മീലിമുട്ടയുടെ അഞ്ച് പ്രധാന സ്പീഷിസുകളാണ് കുരുമുളകിലെ ആക്രമണകാരികൾ. പ്ലാനോ കോക്കസ് വിഭാഗത്തിൽ പെട്ടവരാണ് ഇതിലെ പ്രബലർ.

മണ്ണിനടിയിലും വള്ളി മണ്ണോട് ചേർന്ന ഭാഗത്തുമായതുകൊണ്ട് പലപ്പോഴും മീലിമുട്ട കർഷകരുടെ ശ്രദ്ധയിൽപെടാറില്ല എന്നതാണ് വാസ്തവം. കുരുമുളക് വള്ളിയുടെ

പ്രായമൊന്നും മീലിമുട്ടയ്ക്ക് പ്രശ്നമല്ല. എല്ലാ പ്രായക്കാരെയും ആക്രമിക്കാൻ ഇവന് പ്രത്യേക കഴിവുണ്ട്.

നല്ല ഗുണമുള്ള വേപ്പിൻ പിണ്ണാക്ക് 2 കിലോഗ്രാമെങ്കിലും കൊടിയുടെ ചുവട്ടിൽ നൽകുന്നത് നന്ന്. കേന്ദ്രകിഴങ്ങുവിള ഗവേഷണ കേന്ദ്രത്തിൽ നിന്നും പുറത്തിറക്കിയ 'ശ്രോയസ്' മീലിമുട്ട നിയന്ത്രണത്തിന് പ്രയോഗിക്കാം.

5 മില്ലി ശ്രോയസ്സ് 100 മില്ലി വെള്ളം എന്ന തോതിൽ കലർത്തി തടം കുതിർക്കണം. വേപ്പെണ്ണ എമൽഷനും ആദ്യഘട്ടത്തിലെ മീലിമുട്ട നിയന്ത്രണത്തിൽ പ്രധാന പങ്ക് വഹിക്കാനാകും. ജൈവാംശം കുറഞ്ഞ തോട്ടങ്ങളിൽ ട്രൈക്കോഡർമ്മ സമ്പുഷ്ടീകരിച്ച ജൈവവളം 10 കിലോഗ്രാമെങ്കിലും ചേർക്കണം. വെർട്ടിസീലിയം ലെക്കാനി 20 ഗ്രാം 1 ലിറ്റർ വെള്ളത്തിൽ കലക്കി തടം കുതിർക്കുന്നത് മീലിമുട്ടയ്ക്കുള്ള ജൈവകീടനിയന്ത്രണ മാർഗ്ഗം.

കുരുമുളകിന് പുതിയ കൃഷിരീതിയുമായി ആന്റണി വൈദ്യർ

Dec 6, 2018, 04:35 PM IST

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വ്യത്യസ്തമായ രീതിയിൽ കുരുമുളക് വളളികളെ പരിപാലിച്ച് പ്രളയത്തെ അതിജീവിച്ച ആന്റണി വൈദ്യരുടെ കൃഷിരീതികൾ അറിയാം

ഷാൻ ജോസഫ്



മണ്ണിന്റെ സ്വാഭാവിക ഘടനയെ തകർത്തറിഞ്ഞാണ് ഇക്കുറി കാലവർഷം പെയ്തൊഴിഞ്ഞത്. വേരുകൾ ദുർബലമായ കുരുമുളകും നെല്ലുമടക്കമുള്ള വിളകൾക്ക് കഷ്ടകാലമായിരുന്നു മഴക്കാലം. നിർത്താതെ പെയ്ത മഴ ഏറ്റവുമധികം ബാധിച്ചത് കുരുമുളക് വളളികളെയാണ്. ഇലകൾ പഴുത്തും വളളികൾ കരിഞ്ഞും കുരുമുളക് കൃഷി പാടേ നശിച്ചപ്പോൾ കർഷകർക്കുണ്ടായത് വലിയ നഷ്ടമാണ്. ഇടക്കാലത്തെ മാനുഷനിൽ നിന്ന് കരകയറിക്കൊണ്ടിരുന്ന കറുത്തപൊന്നിനെ വീണ്ടും നിലയില്ലാക്കയെത്തിലേക്ക് തള്ളിയിട്ടാണ് ഇടവപ്പാതി പിൻവാങ്ങിയത്. ജില്ലയിൽ കുരുമുളക് കൃഷിയിൽ 90 ശതമാനം കുറവുണ്ടായതായി വിവിധ ഏജൻസികൾ നടത്തിയ സർവ്വേയിൽ കണ്ടെത്തിയിരുന്നു. അവശേഷിച്ച പത്തുശതമാനം പേർ തങ്ങളുടേതായ രീതികൾ അവലംബിച്ചാണ് അതിവർഷത്തെ അതിജീവിച്ചത്.

ശക്തമായ മഴയിൽ വളളികൾ വ്യാപകമായി ചീഞ്ഞുപോയപ്പോൾ പിടിച്ചുനിൽക്കാനായത് വ്യത്യസ്തമായ രീതിയിൽ കുരുമുളക് വളളികളെ പരിപാലിച്ചവർക്കാണ്. അക്കൂട്ടത്തിലൊരാളാണ് വാഴവറ്റ ശ്രീധരീയം സൗഭദ്രയിലെ ആന്റണി വൈദ്യർ. വളളികൾക്ക് വളരാൻ പ്രത്യേക അറകൾ ഒരുക്കിയും ഇരുമ്പുവലകൊണ്ട് താങ്ങുകാലൊരുക്കിയുമാണ് പുതിയ കൃഷിരീതി ഇദ്ദേഹം രൂപകല്പന ചെയ്തത്. ജൈവരീതിയിൽ കൃഷിചെയ്ത ഇരുപതിനും കുരുമുളകാണ് അതിവർഷം അനുകൂലമാക്കി നല്ല വിളവ് നൽകിയിരിക്കുന്നത്.

ഒരോ ചുവടിനും പ്രത്യേകം അറകൾ

ശക്തമായ മഴയിൽ മേൽമണ്ണ് ഒലിച്ചുപോയതാണ് ഒട്ടുമിക്ക കൃഷിയിടങ്ങളും നാമാവശേഷമാകാൻ കാരണമെന്ന് ആന്റണി വൈദ്യർ പറയുന്നു. ഈ പ്രതിഭാസത്തിൽനിന്ന് രക്ഷനേടാനായത് പ്രത്യേകം അറകൾ നിർമ്മിച്ച് വളളികൾ അതിനുള്ളിൽ നട്ടതിനാലാണ്. രണ്ടടി ഉയരത്തിലും നാലടി വിസ്തൃതിയിലുമുള്ള അറകളാണ് ഇതിനായി തയ്യാറാക്കിയിരിക്കുന്നത്. ഉമിയും ചാണകവും മണ്ണും ചേർത്ത് അറകൾ നിറക്കുന്നു. താങ്ങുകാലായി ഇരുമ്പുവല സ്ഥാപിക്കുന്നു. ഇതിനു പുറത്താണ് കുരുമുളക് വളളികൾ നടുന്നത്. രണ്ടടിയോളം ഉയരത്തിൽ വളരുന്നതിനാൽ നീർവാർച്ച ഉറപ്പാക്കാൻ സാധിക്കുന്നു. രണ്ടാഴ്ച കൂടുമ്പോൾ കടലപ്പിണ്ണാക്കും ചാണകവും ചേർത്ത ലായനി ചുവട്ടിൽ ഒഴിച്ചുകൊടുക്കുന്നു. എത്ര തോതിൽ മഴപെയ്താലും വെള്ളം മണ്ണിന്റെ അടിത്തട്ടിലേക്ക് വലിച്ചെടുക്കുന്ന തരത്തിലാണ് അറകളുടെ നിർമ്മിതി.

താങ്ങുകാൽ ഇരുമ്പുവലകൊണ്ട്



താങ്ങുകാൽ ഒരുക്കുന്ന ആദ്യഘട്ടം

താങ്ങുകാലുകൾക്ക് രോഗം ബാധിച്ച് വള്ളികൾ നിലംപൊത്തുന്നത് വയനാട്ടിലെ സ്ഥിരം കാഴ്ചയാണ്. ഇതിന് പരിഹാരമായാണ് ഇരുമ്പുവലകൾ കൊണ്ട് താങ്ങുകാലൊരുക്കിയത്. മണ്ണൊരുക്കിയതിന് ശേഷം ഇരുമ്പുവല സ്ഥാപിച്ച് അതിനുള്ളിൽ അടയ്ക്കാ ചകിരി നിറയ്ക്കുന്നു. ശേഷമാണ് കുരുമുളക് വള്ളികൾ നടുന്നത്. വെള്ളത്തിന്റെ സാന്നിധ്യത്തിൽ ചീർത്തുവരുന്ന അടയ്ക്കാചകിരികൾ വള്ളികൾക്ക് കരുത്തുപകരും. ഈ ചകിരിയിലേക്ക് പറ്റിപ്പിടിച്ചാണ് വള്ളികൾ വളരുന്നത്. 10 അടി ഉയരത്തിൽ വളർത്തുന്നതിനാൽ പരിപാലിക്കാനും വിളവെടുക്കാനും എളുപ്പം. തോട്ടങ്ങളിൽ പരിപാലിക്കുന്നതിനേക്കാൾ എളുപ്പവും ഉത്പാദനം കൂട്ടാനും ഈ രീതി ഉപകരിക്കുമെന്ന് ആന്റണി വൈദ്യൻ അവകാശപ്പെടുന്നു.

സ്ഥലപരിമിതിയിലും കൂടുതൽ വിളവ്

മലബാർ, ശക്തി, തെക്കൻ തൂടങ്ങി ഇരുപതിനും കുരുമുളകാണ് ആന്റണി വൈദ്യൻ പരിപാലിക്കുന്നത്. രണ്ടുവർഷം മുൻപ് നട്ട 37 വള്ളികളിൽനിന്ന് ഇക്കൂറി രണ്ടു ക്വിന്റൽ കുരുമുളക് പ്രതീക്ഷിക്കുന്നു. നാലാംവർഷത്തിൽ നാലു ക്വിന്റൽ വരെ വിളവ് ലഭിക്കും. വാഴവറ്റയിലെ ഇദ്ദേഹത്തിന്റെ വീടിനോട് ചേർന്ന 34 സെന്റിലാണ് ഇത്രയും വള്ളികൾ പരിപാലിക്കുന്നത്.



ടാർവീപ്പയും ടയറും പാഴാക്കണ്ട

കോൺക്രീറ്റ് കൊണ്ട് അറകൾ നിർമ്മിക്കാൻ ചെലവ് കൂടുതലാണെന്ന് തോന്നുന്നെങ്കിൽ അതിനും പോംവഴിയുണ്ട്. ചെറിയ വിലക്ക് കിട്ടുന്ന ടാർവീപ്പയും ടയറും ഉപയോഗിച്ച്

കുരുമുളക് വളർത്താം. കാലിയായ ടാർ വീപ്പയുടെ അടിവശം തുറന്നശേഷം വള്ളികൾ നടാം. ഇരുമ്പുപൈപ്പിൽ നൈലോൺ വല ചുറ്റി താങ്ങുകാലുകൾ ക്രമീകരിക്കാം. ഉപയോഗശൂന്യമായ ടയറുകൾ നാലെണ്ണം അടുക്കായി വെച്ച് അതിനുള്ളിലും വള്ളികൾ നടാം. ടയറിന്



ഉപയോഗശൂന്യമായ ടയറിനുള്ളിൽ വളരുന്ന കുരുമുളക് വള്ളി

ഉൾവശത്ത് സംഭരിച്ചുവെക്കുന്ന വെള്ളം വളർച്ചയ്ക്ക് സഹായിക്കും. ഈ രണ്ട് മാതൃകകളും ഇവിടെ വിജയകരമായി പരീക്ഷിച്ചിരിക്കുന്നു. രാസവളവും കീടനാശിനിയും ഉപയോഗിക്കാത്ത കൃഷിയിടമാണിത്. തുമ്പകൊണ്ട് ചുവടിക്കാതിരിക്കുകയും കീടനാശിനി പ്രയോഗിക്കാതിരിക്കുകയും ചെയ്താൽ കുരുമുളക് കർഷകർക്ക് ഇനിയും മടങ്ങിവരവ് സാധ്യമാണെന്ന് അദ്ദേഹം പറയുന്നു.

വിപണിയില്ല,വിലയും : മനംനൊന്ന് കർഷകനും കച്ചവടക്കാരനും

മാതൃഭൂമി-20-DEC-2018

വിളവുകുറഞ്ഞാൽ വിലകൂടുമെന്നായിരുന്നു ധാരണ. എന്നാൽ, മലഞ്ചരക്ക് മേഖലയിൽ കർഷകരും ചെറുകിട കച്ചവടക്കാരും വിളവും വിലയുമില്ലാതെ നട്ടംതിരിയുകയാണ്.

കുരുമുളക്

പ്രളയത്തെത്തുടർന്ന് കുരുമുളക് ഉത്പാദനം 25 ശതമാനം കുറഞ്ഞത് ഇന്ത്യൻ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് സ്പൈസസ് റിസർച്ച് പറയുന്നു. 10,700 ടണ്ണാണ് നഷ്ടം. പ്രളയശേഷം കുരുമുളകുവള്ളികൾ വ്യാപകമായി ഉണങ്ങുന്നു. ദ്രുതവാട്ടം ഉൾപ്പെടെ രോഗങ്ങളാൽ നേരത്തേതന്നെ കൃഷി പ്രതിസന്ധിയിലാണ്. പുതിയ ഇനങ്ങൾക്ക് കാലാവസ്ഥാവ്യതിയാനത്തിൽ പിടിച്ചുനിൽക്കാനായില്ലെന്ന് കർഷകർ പറയുന്നു.

കൂലി കുത്തനെ ഉയർന്നതാണ് മറ്റൊരു പ്രതിസന്ധി. വിളവെടുക്കാൻ ആളെയും കിട്ടാനില്ല. വയനാട്ടിൽ 40,000 ഹെക്ടർ വരെയുണ്ടായിരുന്ന കൃഷി ഇപ്പോൾ 10,000 ഹെക്ടറിൽ താഴെയായി. 20,000 ടണ്ണിനുമേലെ ഉത്പാദനമുണ്ടായിരുന്നത് 4000 ടണ്ണിൽ താഴെയായി. വിലയിടിവിനെത്തുടർന്ന് പലരും കൃഷിയുപേക്ഷിച്ചു. മറ്റുജില്ലകളിലും സ്ഥിതി വ്യത്യസ്തമല്ല.

2016-17ൽ കിലോയ്ക്ക് 700 രൂപ വരെ കിട്ടിയിരുന്നു. ഇപ്പോൾ 350 രൂപയാണ് വില. ഇത് കർഷകരെപ്പോലെത്തന്നെ കച്ചവടക്കാരെയും പ്രതിസന്ധിയിലാക്കുന്നു. ശേഖരിച്ചുവെച്ച കുരുമുളക് വിൽക്കാനാകുന്നില്ല. അതിനാൽ, കർഷകരിൽനിന്ന് മുളകെടുക്കാൻ ഇവർ മടിക്കുന്നു.

വിയറ്റ്നാമിൽനിന്ന് ഇറക്കുമതികൂടിയാണ് കുരുമുളകുവില കുത്തനെ കുറയാനിടയാക്കിയത്. അവിടെ ഉത്പാദനം മൂന്നിരട്ടിവരെ കൂടി. കേന്ദ്രസർക്കാർ നിയന്ത്രണങ്ങൾ കൊണ്ടുവന്നിട്ടും ഇറക്കുമതി നിയന്ത്രിക്കാനാകുന്നില്ല. ശ്രീലങ്കയ്ക്കുള്ള ഇളവുമുതലാക്കി, ആ പേരിൽ വിയറ്റ്നാം മുളക് എത്തുന്നുമുണ്ട്.

മുൻവർഷങ്ങളിലെ വില

2014-15 686.64

2015-16 655.22

2016-17 694.77

2017-18 473.73

2018-19* 382.25

*ഒക്ടോബർ വരെ

ജാതി

ഹൈറേഞ്ചിലും തൃശ്ശൂർ, എറണാകുളം ജില്ലകളിലും പ്രളയം തകർത്ത വിളയാണ് ജാതി. കൃഷി വ്യാപകമായി നശിച്ചു. കർഷകർക്ക് വൻ നഷ്ടമുണ്ടായി. കൃഷി ഇതുവരെ പഴയ നിലയിലേക്കെത്തിയിട്ടില്ല.

വേനൽ കടുക്കുന്നത് കൃഷിയെ ബാധിക്കും. കാലാവസ്ഥാവ്യതിയാനവും ജാതിക്കാ ഉത്പാദനം കുറച്ചു. മുൻവർഷങ്ങളെ അപേക്ഷിച്ച് ഉത്പാദനത്തിൽ 40 ശതമാനം കുറവുണ്ട്. വിലയും കുറഞ്ഞു. മുൻവർഷങ്ങളിൽ ജാതിപത്രി കിലോയ്ക്ക് 1800 രൂപ വരെ ലഭിച്ചിരുന്നു. ഇത് പകുതിയിൽതാഴെ മാത്രമാണിപ്പോൾ.

ഏലം

ഉത്പാദനം കുറഞ്ഞെങ്കിലും വില കുറഞ്ഞില്ലെന്നത് തെല്ലാശ്വാസമാണ്. അതേസമയം, വിലയുള്ളപ്പോൾ വിളവില്ലെന്ന പ്രതിസന്ധിയുമുണ്ട്. വിപണിയിൽ ഏലം വരവ് പകുതിയായി കുറഞ്ഞു.

പ്രളയക്കെടുതി ഏലംകൃഷിയെയും ബാധിച്ചു. ഇടുക്കിയിലും വയനാട്ടിലുമാണ് കൃഷി കൂടുതൽ. മേൽമണ്ണിലെ ജൈവാംശം കുറഞ്ഞത് വേരിന് കേടുവരുന്ന രോഗങ്ങളാൽ വലിയ കൃഷിനാശമുണ്ടായി. കിലോയ്ക്ക് 2000 രൂപ വരെ കിട്ടുന്നുണ്ട്. 2010-11നുശേഷം ലഭിക്കുന്ന ഉയർന്ന വിലയാണിത്.

അടയ്ക്ക

ആവശ്യം കുറഞ്ഞതാണ് അടയ്ക്ക വിലയിടിവിന് കാരണം. ഓരോ മാസവും വില താഴേക്കാണ്. ക്വിന്റലിന് 5,000 രൂപ വരെ കുറഞ്ഞു. പഴയ അടയ്ക്ക ക്വിന്റലിന് 30,000 രൂപയുണ്ടായിരുന്നത് 25,000-ത്തിലെത്തി. പുതിയതിന് 25,000 രൂപയിൽനിന്ന് 20,000-ത്തിലേക്കും. പ്രധാന വിപണിയായ ഉത്തരേന്ത്യയിൽ ആവശ്യം കുറഞ്ഞതും വിലയിടിവിന് കാരണമായിട്ടുണ്ട്