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AGRI Titbits

Monthly bulletin of Agricultural News

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

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Spices

Kashmir saffron set to bloom in Maharashtra

The Hindu-16-Dec-2020

In a unique experiment, a few farmers in the Mahabaleshwar hill station area of Maharashtra have planted Himalayan saffron for the first time. The saffron flowers have started blooming in Mahabaleshwar which has low temperature, suitable soil and is at 4,500 ft above mean sea level location.The spice derived from the saffron flowers stigma is the most costliest in the world and in the domestic market, it fetches ₹3-3.5 lakh per kg.

The farmers are keeping their fingers crossed and are waiting for the full bloom in January hoping the temperature does not rise beyond a certain threshold due to global warming. The local agriculture officers have sourced the planting material in the form of bulbs from the Kishtwar region of Jammu and Kashmir.

Mahabaleshwar is already well known for its strawberries extensively cultivated here for the last three decades. Ganesh Jambhle, a farmer from Mahabaleshwar, said that the cultivation cost of he fruit has been rising over the years, while the income doesn't go beyong ₹3.5 lakh per acre. Therefore, he was looking for alternative crops and realised that the saffron bulb can yield the flowers for 10 years. On the other hand, strawberry requires replanting every year from the nurseries to the fields.

If the experiment is successful, then one acre could yield over 2-3 kg of saffron, which will provide much better revenue than the strawberries. Jambhle's efforts are supported by the District Superintendent of Agriculture, Vijay Raut, who told *BusinessLine* that the spice plant requires 10 degrees centigrade of temperature, which is present in Mahabaleshwar from November to January. This year, due to extended rains, the planting could not happen in August, but it was carried out in October and the farmers are waiting for the January harvest.

Ganesh Borde, Agriculture Assistant of Mahabaleshwar, said the cultivation of saffron is very difficult because obtaining a kg of saffron spice requires processing and removing stigma from 1.5 lakh flowers.

Covid-19 impact: Lack of bulk demand pounds spices

https://www.thehindubusinessline.com/18-december-2020

Prices of key spice commodities fell in the range of 8% to 56% this year.The year 2020 has turned out to be a bad one for spices. The price data of top four exchanged-traded spices including cumin seed (jeera), coriander (dhaniya), turmeric and cardamom indicate a sharp fall in the range 8 per cent to as high as 56 per cent during the year making the complex the worst performing agri-commodity segment this year.

Data revealcardamom futures suffered the steepest fall at 56 per cent, followed by coriander and jeera at 16 per cent and 15 per cent, respectively, while turmeric futures fell by about 8.5 per cent during the year.

The reasons for the spice crops losing their flavour are many — changed trade dynamics hurt spices. The bulk investors or stockists kept their inventories low due to uncertainties caused by the pandemic.Sailesh Shah, Director, Jabs International — one of India's largest spices exporters — informed that prices of spices took a hit because of poor demand.

"The market was well-supplied all through this year as the previous monsoon was also good. But as the Covid-19 hit the world, demand took a beating. Because of the economic and business uncertainty, investors and financial players were absent from the market. No buyer was willing to hold the stock, and as a result demand took a hit and impacted prices," Shah said.

Losing aroma*

NCDEX Contracts	LTP (₹)	1 week (%)	1 month (%)	YTD (%)	1 Year (%)	3 Years (%)
Turmeric	5,654	0.53	-0.88	-13.84	-8.45	-21.30
Jeera	13,480	-1.79	-4.16	-17.02	-15.14	-37.42
Coriander	5,800	-3.04	-11.56	-15.45	-15.91	6.70
Cardamom	1,500	0.00	0.00	-60.44	-55.71	38.25

Source: Kedia Commodities *As on Dec 17, 2020

Turmeric turned pale

India grows about 95 lakh bags (of 60 kg each) of turmeric annually, of which 70 lakh bags are consumed locally and about 20 lakh bags are exported. However, in 2020, both domestic and export demand were weak.

Market watchers informed that Covid-19 did bring some optimism for turmeric consumption as an immunity booster, but that didn't last long and help lift the prices from the lows of around ₹5,500/quintal. Even as Unlock has started in India and other parts of the world, turmeric prices are less likely to see any immediate revival, say experts.NCDEX Turmeric December futures quoted at ₹5,698/quintal on December 17.

Coriander, the saviour

Ajay Kedia, Director of Mumbai-based Kedia Commodities, informed that most of the 15 per cent fall in coriander prices happened only over the past one month or so, and was triggered by higher sowing data in Gujarat indicating a bumper crop in upcoming season. "The prices were hovering around ₹6,800/quintal till last month. In the international market, crop arrivals in Romania and Bulgaria kept a lid on prices in all markets. In the domestic market, demand is less but at the same time, the carryover stock is also less, which will limit any further fall," Kedia said. NCDEX coriander December futures were at ₹5,846/quintal on December 17. Coriander traders see consumer sentiment improving on the prospects of Covid-19 vaccine availability. "The sentiment is not as bad as it was six months ago. So we see optimism in prices," said Kedia.

Jeera & Cardamom

Jeera, according to trader sources, faced a fall primarily due to lockdown and demand destruction from the institutional buyers. "There was thin buying even during Diwali. Most traders were asking for cash payments which led to smaller orders as against what used to be large orders on credit. This put additional pressure on the prices," said an Ahmedabad-based trader. Meanwhile, brightened sowing prospects this year has also further weakened the prices. NCDEX Jeera January futures quoted at ₹13,105/quintal on Thursday.

For cardamom, a sharp correction of about 56 per cent in the past one year is primarily attributed to exceptional price condition last year, which was triggered due to widespread crop damage in 2019 owing to floods in Kerala, the key growing State. As a result, prices hit through the roof to ₹4,465/kg on August 2019, as against ₹1,470 in the same month the previous year. Cardamom futures are in the range of ₹1,500/kg, which, according to analysts, is a return to normal price levels.

Demand for immunity boosting spices on the rise amid Covid constraints

Fnbnews.com-22-Dec-2020

The demand for immunity boosting spices has increased, despite constraints of the pandemic-related lockdown. The volume and value of Indian spices has increased in exports.

While talking to FnB News, BN Jha, Deputy Director, Marketing, Spices Board of India, Mumbai, said, "Achievement can be seen for 2010-11, 2014-15, and 2019-20 compared to last year exports in volume have increased by 8 per cent in volume and 10 per cent in value rupees. Turmeric is showing very good business scope in exports of 1,36,000 mt value of 1216.40 cr which contribute 11 per cent in volume and 6 per cent in value out of total exports. We have not noticed any downward trend in spices consumption even during Covid-19.Also, the adulteration of spices has come down this year."

Focussing on exports, he said, “The exports of turmeric, chilly, cumin have been increasingly high this year compared to previous year. We also export herbal spices. India exports 50 per cent value-added spices.”The Board has also conducted seven online Buyer-Seller Meets (BSMs), speaking about the same, he added, “The BSM is organised with a focus on different state's spices production potential. Accordingly, interaction with the buyers and sellers are organised to facilitate the business.”Talking about the consumption of spices, Paras Budhiraja, MD of Paras Spices Private Limited, said, “The consumption of spices in India post-Covid has increased.

Turmeric consumption is increasing, the sowing of these crops has also increased. In some areas in India, because of the floods, some crops like chilli were affected mainly in places like Tamil Nadu, Telangana and Andhra Pradesh. This kind of factor led to crop shortage in certain regions so the prices have gone up. But then the consumption of spices has gone up. Other spices like coriander or others which grow in Gujarat and Rajasthan mainly, the Western part of India, these crops have come down. There are pricing related challenges post covid. Kerala is home of spices, the more consumption of spices is in Kerala. Some ingredients are bought internationally, nowadays, it takes more time to reach India. Around 20 per cent of our market has gone up compared to last year.”

Vijay Prasad, executive director, Annapoorna Masalas and Spices, Coimbatore, said, “In India, spices were not only used for its distinct flavours and colour but also for medicinal properties. Over the years, this property of spices slowly started losing its importance. This pandemic has brought in a major shift in consumer behaviour. This has led to increase in consumption of certain spices namely turmeric, ginger and pepper among others.”

Explaining about the challenges post-Covid, he added, “Considering the market size and potential of this category, a lot of new players have ventured into this space. The main challenge after this lockdown was to connect the broken supply chain and procurement of raw materials which is being worked upon. We are trying to bring process efficiency through cost control on consumables, reducing process waste, implementing automation wherever possible.”

Spices export gets a boost amid Covid pandemic, crosses 7 lakh tonne in India

Kochi: Amid the COVID-19 spread around the globe, India’s spices export crossed 7 lakh tonne during April-September. Compared to 2019, the export of spices has increased by 19 percent in this year. The annual income from spices export also rose by 16 percent.

In 2020, India exported 7,00,150 tonne spices worth Rs 12,273.81 crore during April-September 2020. However, 5.86 lakh tonne spices worth Rs 10,588.9 8 crore was exported

during the same period in 2019. Chilli, cumin seed, turmeric, coriander and ginger topped the list of most exported spices.

Chilli tops in exports Chilli has topped in the list as the largest exported spice with the shipment of 2.6 lakh tonne worth Rs 3,605 cr in April-September 2020.

Demand for immunity-boosting spices props up overall prices

The Hindu-25-Dec-2020

It was a roller coaster ride for agri commodities, especially spices, in 2020. Prices of spices which were shooting through the roof for last three months, have seen a correction in the last fortnight and are now virtually at the same level as in last year.

However, the immunity-boosting properties of certain spices such as pepper, cardamom and tea during the Covid-19 pandemic have turned out to be a blessing for better price realisation, that too in the later part of the year, for farmers.

Prashant Bhansali, President of UPASI (United Planters' Association of Southern India), said that the plantation sector is facing many structural issues such as high cost of production due to increase in wages, input costs, acute shortage of workers, climate change etc, and that there is a need for a focussed research that delivers technological advances in production, productivity, agronomical practices and post-harvest technology.

Cardamom – gains flavour

The average price of cardamom that farmers received in the August-October period was ₹1,573.96/kg (down from about ₹3,800-4,000/kg in the beginning of the year).

This rallied to ₹1,820.76/ per kg by mid-December. Traders are bullish on the current rising trend as the sector has reached the fag end of the harvest season. Besides, crop failure in Guatemala — the largest producer of cardamom — due to tropical storms and floods has caused Indian prices to surge. This may lead to supply pressure in the market, which would aid domestic prices.

Similarly, there has been a good upcountry demand after opening up of the markets in the last couple of months. Despite the recent rally, prices have plunged over the last year – when they ruled at ₹3,100-3,400/kg.

Pepper – not so hot

The latest price as on December 14 at Kochi market was ₹354/kg for garbled and ₹334/kg for ungarbled pepper, which is slightly higher than the price realised a couple of months ago. Beginning of the year, prices were around ₹344-349/kg. Nishant R Gujrer, Chairman,

UPASI Spices Committee, said that pepper prices in the short-term would-be range bound at the current levels as there is an increase in demand for pepper, given its immunity boosting properties.

In the medium- to long-term, there could be gains in pepper prices as new planting and replanting activity were subdued in the last few years due to low prices. This should exert supply pressure and, in turn, aid price stability.

Global pepper production in 2019-20 was 5,91,946 tonnes, while domestic production was at 61,000 tonnes. The global production would be lower in the current year due to unfavourable weather, while domestic production is expected to be around last year's levels.

Research News

The aroma of distant worlds

New evidence that spices, fruits from Asia had reached the Mediterranean earlier than thought

sciencedaily.com **December 21, 2020**

Asian spices such as turmeric and fruits like the banana had already reached the Mediterranean more than 3000 years ago, much earlier than previously thought. A team of researchers working alongside archaeologist Philipp Stockhammer at Ludwig-Maximilians-Universität in Munich (LMU) has shown that even in the Bronze Age, long-distance trade in food was already connecting distant societies.

A market in the city of Megiddo in the Levant 3700 years ago: The market traders are hawking not only wheat, millet or dates, which grow throughout the region, but also carafes of sesame oil and bowls of a bright yellow spice that has recently appeared among their wares. This is how Philipp Stockhammer imagines the bustle of the Bronze Age market in the eastern Mediterranean. Working with an international team to analyze food residues in tooth tartar, the LMU archaeologist has found evidence that people in the Levant were already eating turmeric, bananas and even soy in the Bronze and Early Iron Ages. "Exotic spices, fruits and oils from Asia had thus reached the Mediterranean several centuries, in some cases even millennia, earlier than had been previously thought," says Stockhammer. "This is the earliest direct evidence to date of turmeric, banana and soy outside of South and East Asia." It is also direct evidence that as early as the second

millennium BCE there was already a flourishing long-distance trade in exotic fruits, spices and oils, which is believed to have connected South Asia and the Levant via Mesopotamia or Egypt. While substantial trade across these regions is amply documented later on, tracing the roots of this nascent globalization has proved to be a stubborn problem. The findings of this study confirm that long-distance trade in culinary goods has connected these distant societies since at least the Bronze Age. People obviously had a great interest in exotic foods from very early on.

For their analyses, Stockhammer's international team examined 16 individuals from the Megiddo and Tel Erani excavations, which are located in present-day Israel. The region in the southern Levant served as an important bridge between the Mediterranean, Asia and Egypt in the 2nd millennium BCE. The aim of the research was to investigate the cuisines of Bronze Age Levantine populations by analyzing traces of food remnants, including ancient proteins and plant microfossils, that have remained preserved in human dental calculus over thousands of years.

The human mouth is full of bacteria, which continually petrify and form calculus. Tiny food particles become entrapped and preserved in the growing calculus, and it is these minute remnants that can now be accessed for scientific research thanks to cutting-edge methods. For the purposes of their analysis, the researchers took samples from a variety of individuals at the Bronze Age site of Megiddo and the Early Iron Age site of Tel Erani. They analyzed which food proteins and plant residues were preserved in the calculus on their teeth. "This enables us to find traces of what a person ate," says Stockhammer. "Anyone who does not practice good dental hygiene will still be telling us archaeologists what they have been eating thousands of years from now!"

Palaeoproteomics is the name of this growing new field of research. The method could develop into a standard procedure in archaeology, or so the researchers hope. "Our high-resolution study of ancient proteins and plant residues from human dental calculus is the first of its kind to study the cuisines of the ancient Near East," says Christina Warinner, a molecular archaeologist at Harvard University and the Max Planck Institute for the Science of Human History and co-senior author of the article. "Our research demonstrates the great potential of these methods to detect foods that otherwise leave few archaeological traces. Dental calculus is such a valuable source of information about the lives of ancient peoples."

"Our approach breaks new scientific ground," explains LMU biochemist and lead author Ashley Scott. That is because assigning individual protein remnants to specific foodstuffs is no small task. Beyond the painstaking work of identification, the protein itself must also survive for thousands of years. "Interestingly, we find that allergy-associated proteins appear to be the most stable in human calculus," says Scott, a finding she believes may be due to the known thermostability of many allergens. For instance, the researchers were able to detect wheat via wheat gluten proteins, says Stockhammer. The team was then able to independently confirm the presence of wheat using a type of plant microfossil known as phytoliths. Phytoliths were also used to identify millet and date palm in the Levant during the Bronze and Iron Ages, but phytoliths are not abundant or even present in many foods, which is why the new protein findings are so groundbreaking -- paleoproteomics enables the identification of foods that have left few other traces, such as sesame. Sesame proteins were identified in dental calculus from both Megiddo and Tel Erani. "This suggests that

sesame had become a staple food in the Levant by the 2nd millennium BCE," says Stockhammer.

Two additional protein findings are particularly remarkable, explains Stockhammer. In one individual's dental calculus from Megiddo, turmeric and soy proteins were found, while in another individual from Tel Erani banana proteins were identified. All three foods are likely to have reached the Levant via South Asia. Bananas were originally domesticated in Southeast Asia, where they had been used since the 5th millennium BCE, and they arrived in West Africa 4000 years later, but little is known about their intervening trade or use. "Our analyses thus provide crucial information on the spread of the banana around the world. No archaeological or written evidence had previously suggested such an early spread into the Mediterranean region," says Stockhammer, although the sudden appearance of banana in West Africa just a few centuries later has hinted that such a trade might have existed. "I find it spectacular that food was exchanged over long distances at such an early point in history."

Stockhammer notes that they cannot rule out the possibility, of course, that one of the individuals spent part of their life in South Asia and consumed the corresponding food only while they were there. Even if the extent to which spices, oils and fruits were imported is not yet known, there is much to indicate that trade was indeed taking place, since there is also other evidence of exotic spices in the Eastern Mediterranean -- Pharaoh Ramses II was buried with peppercorns from India in 1213 BCE. They were found in his nose.

The results of the study have been published in the journal PNAS. The work is part of Stockhammer's project "FoodTransforms -- Transformations of Food in the Eastern Mediterranean Late Bronze Age," which is funded by the European Research Council. The international team that produced the study encompasses scientists from LMU Munich, Harvard University and the Max Planck Institute for the Science of Human History in Jena. The fundamental question behind his project -- and thus the starting point for the current study -- was to clarify whether the early globalization of trade networks in the Bronze Age also concerned food. "In fact, we can now grasp the impact of globalization during the 2nd millennium BCE on East Mediterranean cuisine," says Stockhammer. "Mediterranean cuisine was characterized by intercultural exchange from an early stage."

Long-Distance Trade Existed 3,000 Years Ago Find Researchers From Traces of Turmeric

news18.com DECEMBER 22, 2020

Ateam of scientists have found that the Mediterranean region was already engaged in long distance trading of exotic spices and fruits from Asia in the Bronze Age. Archaeologists from the German university of Ludwig-Maximilians-Universität (LMU) in Munich have revealed in recent research that Asian spices like turmeric, and fruits like bananas had reached the Mediterranean more than

3000 years ago, which is much earlier than previously thought.

Published in the journal, Proceedings of the National Academy of Sciences of the United States of America (PNAS), the research was done by an international team of archaeologists.

The results were derived by an international team of archaeologists from LMU who analysed the food residues in tooth tartar in the people of Levant. The researchers traced the transformation of Eastern Mediterranean cuisines during the Bronze Age and Early Iron Age by analysing micro remains and proteins preserved in the dental calculus of individuals who lived during the second millennium BCE in the Southern Levant region.

The team found residues of turmeric, bananas, and even soy in the skeletons of humans that dated back to the Bronze Age and early Iron Ages. Apart from this, archaeologists also found evidence of cereals, dates, and sesame.

Lead author and LMU bio-archaeologist Ashley Scott said that their approach marks new scientific territory. She said that once a protein has survived for thousands of years, identifying it becomes a major challenge. Scott mentioned that allergy-causing proteins were most stable in tartar. With their research method, the researchers found sesame proteins in samples from Megiddo and Tel Erani.

The international team studied 16 individuals from the Megiddo and Tel Erani excavations. The region is located in present-day Israel. Reason why archaeologists chose this region was because Southern Levant was an important bridge between the Mediterranean, Asia and Egypt in the second millennium BCE.

Speaking about the significance of this research, archaeologist Philipp Stockhammer from LMU said that this is the earliest direct evidence to date of use of turmeric, banana and soy outside of South and East Asia. The research also proves that there was already a well-developed long-distance trade in exotic fruits, spices and oils, which they believe, connected South Asia and the Levant via Mesopotamia or Egypt in the second millennium BCE.

Before this research, there was a well-documented report on substantial trade across these regions that traced the roots of early globalization. The findings of this study confirm that people always had an interest in exotic foods and long-distance trade in culinary goods connected these distant societies since at least the Bronze Age.

Biodiversity

Evolution of tropical biodiversity hotspots: Look to harsh species-poor areas

Science Daily December 11, 2020

For decades, scientists have worked to understand the intricacies of biological diversity -- from genetic and species diversity to ecological diversity.

As they began to comprehend the depths of diversity across the planet, they noticed an interesting pattern. The number of species increases drastically from the poles to the equator. This phenomenon, known as the latitudinal gradient of species diversity, has helped define the tropics as home to most of the world's biodiversity. Scientists estimate that tropical forests contain more than half the species on earth, from plants and insects to birds, amphibians, and mammals.

These biologically rich areas are known as biodiversity hotspots. To qualify as a hotspot, a region must have at least 1,500 vascular plants species occurring nowhere else and have 30 percent or less of its original natural vegetation. In other words, it must be both irreplaceable and threatened.

While scientists agree that most biological diversity originated in the tropics, the jury is still out on how tropical species diversity formed and how it is maintained. A new study published in *Science* addresses these long-standing questions.

In "The evolution of tropical biodiversity hotspots," researchers argue that tropical species form faster in harsh species-poor areas but accumulate in climatically moderate areas to form hotspots of species diversity. Drawing on decades of expeditions and research in the tropics and the scientists' own knowledge and sampling of tropical bird diversity, the research team assembled a large and complete phylogenomic dataset for a detailed investigation of tropical diversification.

"This is our magnum opus," said Elizabeth Derryberry, associate professor in the University of Tennessee, Knoxville's Department of Ecology and Evolutionary Biology (EEB) and a senior author of the study. "This research is the product of a decades-long international collaboration to produce a completely sampled evolutionary history of a massive tropical radiation -- the 1,306 species of suboscine passerine birds."

Roughly one in three Neotropical bird species is a suboscine, making it the predominant avian group in the Neotropic terrestrial habitat -- which ranges from the Andes snow line to the Amazon lowlands -- and a perfect group to shed light on the origins of tropical biodiversity.

"The tropics are a natural laboratory for speciation research," said Michael Harvey, a recent EEB postdoctoral student and lead author of the study. "Many high-profile studies over the years sought answers to fundamental questions concerning species formation and maintenance." These earlier projects, he added, sampled only a minority of the existing species within the group being studied. In addition, said Derryberry, data analysis limitations in nearly all of the previous studies left them open to estimation errors.

For this study, Derryberry, Harvey, EEB Professor Brian O'Meara, and fellow researchers used a time-calibrated phylogenomic tree to provide information needed for estimating the dynamics of suboscine diversification across time, lineages, and geography. They also used the tree to test links between the dynamics and potential drivers of tropical diversity.

"We took no shortcuts in this study," Derryberry said. "We leveraged this unparalleled sampling of tropical diversity to illustrate the tempo and geography of evolution in the tropics. It is the first study to demonstrate conclusively that tropical biodiversity hotspots are linked to climates that are both moderate and stable."

The team discovered that species-rich regions in the tropics contain diversity accumulated during a protracted evolutionary period. A key result of their study is that the best predictor of elevated speciation rates in North and South American suboscines is low species diversity. In other words, new species form at higher rates in areas containing relatively few species.

"The qualities that nurture diversity, lower extinction, and promote the gradual accumulation of species are, paradoxically, not the ones that support biodiversity hotspots," Harvey said. "The hotspots are seeded by species born outside the hotspot in areas characterized by more extreme and less climatically stable climates."

The team discovered that, overall, extreme environments limit species diversity but increase opportunities for populations to evolve to become distinct species. Moderate climates, on the other hand, limit speciation but provide more opportunities for species diversity to accumulate.

"Our study will pave the way for future investigations of evolution in the world's diversity hotspots," Derryberry said. "This paper marks not only a change in our understanding of evolution in the tropics, but also in acknowledgement and valuation of the diversity of culture, expertise, and perspective in the field of ornithology."

International collaboration for the study included researchers from Colombia, Brazil, Uruguay, and Venezuela as well as ornithologists from groups underrepresented in the sciences, include Latino and women researchers.

Plant diversity rapidly declining in Germany.

https://www.downtoearth.org.in/ 17 Dec 2020

Germany's plant diversity decreased by over 15 per cent in over 70 per cent of the 2,000 species examined in the last 60 years. These declines were not limited only to already rare or particularly endangered species.These are the findings of the most comprehensive analysis of plant data from Germany, published in *Global Change Biology* on December 14, 2020.

The study involved researchers from the German Centre for Integrative Biodiversity Research (iDiv), the universities of Jena, Halle and Rostock, the Helmholtz Centre for Environmental Research (UFZ) as well as the Federal Agency for Nature Conservation (BfN).

The average decline in species was around two per cent a decade. This was when every grid field of approximately five by five kilometres across the entire Germany was analysed.

Especially vulnerable were the archaeophytes; species brought to Germany by humans but before the discovery of America. Among others, the species in decline included a large proportion of accompanying field flora, such as the corn marigold and the large Venus's looking glass.

Several neophytes — the species that reached Germany after 1492 — grew in number, including the Himalayan balsam and the narrow-leaved ragwort. The increase, however, could not compensate for the loss in the number of species per unit of area.

BfN President Beate Jessel said:

“This clearly shows, once again, that we have to rethink our approach to nature and landscape; after all, the population declines proven by the study extend over the whole of Germany. We need a broad-based approach to agriculture and forestry, which together occupy 80 per cent of the area in Germany. This demonstrates that there’s an urgent need for more nature-compatible forms of land use.”

Researchers used data from 2,136 of the over 4,300 plant species in Germany to make their calculations. The FlorKart database, in which the Federal Agency for Nature Conservation collated data on the distribution of flora in Germany, was used for the purpose.The data was further supplemented by sets from universities and other scientific institutions, but also by information on the presence of plants from private individuals.

Chorus grows to protect biodiversity

Times of India-02 Dec 2020

Nagpur: The public movement against the inter-model station coming up at Ajni is not just a fight to save thousands of historic trees but also to protect a thriving biodiversity habit which is home to a varities of species of birds,insects and butterflies.

TOI has been regularly reporting about the severe environment damage that will occur if the proposed transport hub and an intermodel station come up at Ajni.Recently different environment experts surveyed the area and found it to be a rich biodiversity hotspot.

A team of entomologists visited the area and recorded over 2 2 different species of insects particularly butterfly.”we spotted some butterfly paired too of tailed jay, angled castor and few others.The fact that they are found in pairis an indication that the habitat is quite healthy.we also spotted honeybees”said ntamologists subham chhapaker and Mamta bhadade.

Not just insects ,the lush green area is also home to over 25 species birds reveal a survey done by ecologist Chetan Pandey and birder Ojaswara Pathak.From the state bird yellow footed green pigeon bird of nagapur oriental honey buzzard to white throated kingfisher,coppersmith barbet,purple sunbird and various others,the area has dynamic bird activity.”Chopping down the tree will lead to habitat degradiation which will cause immense biodiversity losses “said pandey.

Adding that bees and birds are significant ecological servants he said.They act as a pollinators and help in seed dispersal and pest control.To ensure that we get their ecological services,we need to protect their habitat.

The tree that face axe from the project also hold immense ecological value.Most of the trees are native species.There is a wide variety –Climbers,herbs,shrubs and small and big trees.”The most important part is that a great canopy which makes them ideal habit for birds.Right in the middle of the city it is refreshing to find so many birds that too in winter season” said pranchi Mahurker,partner at Punarnava ecological services and eco design solution.

Climate Change

Kashmir's 'Red Gold' Saffron Crop Has Halved and Climate Change Maybe the Reason

https://www.news18.com/23-december-2020

on sweeping fields once blanketed in lush purple, a thin and bedraggled crop of flowers is all farmers in Indian-administered Kashmir's saffron-growing region Pampore have to show for this year's harvest.

Dry conditions blamed on climate change have seen yields of the world's most expensive spice halved in the past two decades, threatening the future of a cash crop that has brought wealth to the region for 2,500 years.

"These fields used to be like goldmines," said Abdul Ahad Mir in Pampore, just south of Indian-administered Kashmir's main city Srinagar.Saffron has long thrived there, and Mir's family was reared in the delicate work of plucking the lucrative but tiny crimson threads from purple crocus flowers.

Warming temperatures caused by climate change have made rainfall erratic, depleting the thirsty saffron fields of water. Shrinking glaciers across the Himalayan region have also cut water flows to the foothills downstream.It takes around 160,000 flowers to yield one kilogram of the precious spice, which will sell for around $1,350 in local markets.But official figures show that harvests of the so-called "red gold" were just 1.4 kilograms per hectare in 2018 -- half the figure recorded in 1998.Mohammad Ramzan Rather says his acreage in Pampore only produced around 30 grams of the crop this year, down from two kilograms 12 years ago.

The harvest season -- which lasts for just two weeks at the end of autumn -- has also been devastated by the coronavirus pandemic, as well as recent security lockdowns in response

to a long-running insurgency in the disputed territory, claimed by both India and arch-rival Pakistan.

Historians say saffron has been cultivated in Kashmir since at least 500 BC.Locally the spice is added to traditional dishes and used as an ingredient in Kehwa, a sweet drink served during special occasions such as marriages.

Elsewhere in the world, it is prized for its use in cooking and cosmetics and can fetch prices of more than $10,000 per kilogram on the international market.

Nearly 90 percent of the world's saffron is grown in Iran, but experts consider Kashmir's crop to be superior for its deep red colour and distinct aroma.

In 2010, Indian authorities sought to halt the impact of climate change by launching a $54 million fund to introduce modern agricultural technology to farmers.Authorities have touted it as a success, claiming it has rejuvenated Kashmir's 3,700 acres of saffron fields.But farmers disagree. They have ripped up plastic irrigation pipes that are now strewn across fields, saying they bring little water and make it harder to till the land.

Others say high-yield seed varieties introduced under the scheme have ruined their crops.Jalal-ud-Din Wani said some farmers were turning their land into orchards because apples need less water.Though he said the government's intervention had failed, Wani believes that the luck of some farmers may improve.If they stick to traditional methods of farming the crop, he said, "there is still a sliver of chance to revive it."

Climate change: Threshold for dangerous warming will likely be crossed between 2027-2042

https://www.sciencedaily.com/ December 21, 2020

. The threshold for dangerous global warming will likely be crossed between 2027 and 2042 -- a much narrower window than the Intergovernmental Panel on Climate Change's estimate of between now and 2052. In a study published in Climate Dynamics, researchers from McGill University introduce a new and more precise way to project the Earth's temperature. Based on historical data, it considerably reduces uncertainties compared to previous approaches.

Climate models are mathematical simulations of different factors that interact to affect Earth's climate, such as the atmosphere, ocean, ice, land surface and the sun. While they are based on the best understanding of the Earth's systems available, when it comes to forecasting the future, uncertainties remain.

"Climate skeptics have argued that global warming projections are unreliable because they depend on faulty supercomputer models. While these criticisms are unwarranted, they underscore the need for independent and different approaches to predicting future warming," says co-author Bruno Tremblay, a professor in the Department of Atmospheric and Oceanic Sciences at McGill University. Until now, wide ranges in overall temperature

projections have made it difficult to pinpoint outcomes in different mitigation scenarios. For instance, if atmospheric CO2 concentrations are doubled, the General Circulation Models (GCMs) used by the Intergovernmental Panel on Climate Change (IPCC), predict a very likely global average temperature increase between 1.9 and 4.5C -- a vast range covering moderate climate changes on the lower end, and catastrophic ones on the other.

"Our new approach to projecting the Earth's temperature is based on historical climate data, rather than the theoretical relationships that are imperfectly captured by the GCMs. Our approach allows climate sensitivity and its uncertainty to be estimated from direct observations with few assumptions," says co-author Raphael Hebert, a former graduate researcher at McGill University, now working at the Alfred-Wegener-Institut in Potsdam, Germany.

In a study for Climate Dynamics, the researchers introduced the new Scaling Climate Response Function (SCRF) model to project the Earth's temperature to 2100. Grounded on historical data, it reduces prediction uncertainties by about half, compared to the approach currently used by the IPCC. In analyzing the results, the researchers found that the threshold for dangerous warming (+1.5C) will likely be crossed between 2027 and 2042. This is a much narrower window than GCMs estimates of between now and 2052. On average, the researchers also found that expected warming was a little lower, by about 10 to 15 percent. They also found, however, that the "very likely warming ranges" of the SCRF were within those of the GCMs, giving the latter support.

"Now that governments have finally decided to act on climate change, we must avoid situations where leaders can claim that even the weakest policies can avert dangerous consequences," says co-author Shaun Lovejoy, a professor in the Physics Department at McGill University. "With our new climate model and its next generation improvements, there's less wiggle room."

Symbiotic relationship between California oaks and mutualist fungi as a buffer for climate change

https://www.sciencedaily.org/ 09 December 2020

"Happy families are all alike; each unhappy family is unhappy in its own way." So goes the first line of Leo Tolstoy's "Anna Karenina." Little did the Russian novelist know his famous opening line would one day be used to describe microbial communities, their health and their relationships to their hosts.

It's this idea that an unhealthy or stressed host to a microbiome has a more diverse microbiome than its healthy counterpart," said UC Santa Barbara ecologist An Bui, a graduate student researcher in the lab of theoretical ecologist Holly Moeller. The diversity, she said, is a response to variable conditions that may in turn indicate an unstable or

stressed environment. "Healthy hosts are probably going to have very similar microbiomes," she said, "while unhealthy hosts are different in their own ways."

Bui and colleagues recently put the Anna Karenina hypothesis to the test in California's Tehachapi mountains as they sought to understand how climate change might affect fungal communities in woodland soil in a future California.

"Fungi are really important for woodland systems," said Bui, the lead author of a study that appears in the journal FEMS Microbiology Ecology. "But we don't necessarily know how they will change with climate change."

As the global average temperature rises, forests and woodlands around the world are under increasing threat, she explained.

"It's not just about temperature and rainfall, but also the organisms the trees and plants associate with," she said. Soil fungi have a variety of relationships with woodland plants. Saprotrophic fungi, for instance, decompose dead organic matter, while pathotrophs eat live organic matter.

And then there are the symbiotrophs, which engage in mutually beneficial relationships with their plant hosts via their roots. Attaching to roots and extending threadlike hyphae in every direction underground -- the so-called "Wood Wide Web" -- mycorrhizae give the woodland tree and plant community access to nutrients from faraway places.

"They get all of their energy in an exchange for carbon from trees and other plants," Bui said. "And then they give their hosts nitrogen and phosphorus from the soil." These fungi provide almost half of a tree's organic nitrogen budget, according to the study, and contribute the bulk of new carbon into the soil.

To get a sense of how warming could affect California's woodland soil fungal community, the team sampled soils at sites along an arid (dry) to mesic (moderately moist) climactic gradient at the Tejon Ranch in the Tehachapi mountains."The sites we worked at were a proxy for what we think California would look like with future climate change," Bui said. As one ascends from the warmer, drier base of the mountains into the cooler, moister elevations, the landscape changes with the temperature and relative humidity, giving the researchers a glimpse of what California woodlands might look like as climate change forces them to retract.Of particular interest to the team were the soils around the oak trees that dot the landscape, where, in addition to the decomposers and pathogenic fungi in the soil, tree-mutualist mycorrhizae create their vast networks. The researchers were interested in how the number of species and their abundance might change between sites.

"As it turns out, the fungal communities are completely different," Bui said. "And the hottest, driest sites have the highest number and the greatest diversity in fungal species." True to the Anna Karenina hypothesis, the trees under the more arid, stressful conditions had the most diverse and dispersed fungal communities.

But, while the larger fungal communities varied from site to site, Bui said, the communities of mutualists within them tended to remain the same, save for small shifts within the mutualist populations to select for traits that could be more useful under the the circumstances.

"When we looked at ectomycorrhizae and arbuscular mycorrhizae, those communities were more similar across climactic conditions than the whole fungal community," she said. "So there's a possibility that host association for mutualists at least buffers that shift in community structure the whole fungal community experiences."If so, the benefit could be reciprocal, according to the researchers. Buffering the fungi from climate change preserves their function, which could, in turn, conserve their host trees' function in the face of a changing California woodland ecosystem.

More work would need to be done to understand how far this buffering effect would extend, but the results are a positive bit of news for the future of California woodlands. Further studies could broaden the scope to include how these relationships and other adaptations might affect tree health, according to Bui."I think this gives us a little bit of hope that the players in this ecosystem that are crucial for the survival of the habitat for many species -- like the oaks -- might be able to keep doing what they're doing," she said. "Even though we do need to do a lot of work in terms of conservation and mitigation, there's a possibility for them to persist. And I think that's hopeful and exciting."

Contribution of life in soil 'remains largely underestimated', says UN agriculture agency

https://news.un.org/ 04 Dec 2020

Ahead of World Soil Day, marked on 5 December, FAO launched its first ever report on "The State of Knowledge of Soil Biodiversity". The report examines the potential of soil organisms in ensuring sustainable agri-food systems and mitigating climate change.

"Soil biodiversity and sustainable soil management is a prerequisite for the achievement of many of the Sustainable Development Goals", said FAO Deputy Director-General Maria Helena Semedo. "Therefore, data and information on soil biodiversity, from the national to the global level, are necessary in order to efficiently plan management strategies on a subject that is still poorly known", she added.

Biodiversity

According to the report, despite the fact biodiversity loss is at the forefront of global concerns, biodiversity below ground is not being given the prominence it deserves and needs to be fully considered when planning how best to boost sustainable development. "We hope that the knowledge contained in this report will facilitate the assessment of the state of soil biodiversity as an integral part of national- and regional-level biodiversity reporting and any soil surveys", Ms. Semedo advanced.

Being one of the main 'global reservoirs' of biodiversity, soils host more than 25 percent of the world's biological diversity. In addition, more than 40 percent of living organisms in terrestrial ecosystems are associated with soils during their life cycle. The report defines soil biodiversity as the variety of life belowground, from genes and animal species, to the

communities they form, as well as the ecological complexes to which they contribute and to which they belong; from soil micro-habitats to landscapes.

These include a wide range of organisms, from unicellular and microscopic forms, to invertebrates such as nematodes, earthworms, arthropods and their larval stages, as well as mammals, reptiles, and amphibians that spend a large part of their life belowground, and a great diversity of algae and fungi.

Keep soil alive, protect biodiversity

Plants nurture a whole world of creatures in the soil, FAO notes, that in return feed and protect the plants. It is this diverse community of living organisms that keeps the soil healthy and fertile, which constitutes soil biodiversity, and determines the main biogeochemical processes that make life possible on Earth.

This year, by addressing the increasing challenges of soil management, the Food and Agriculture Organization (FAO) campaign "Keep soil alive, protect soil biodiversity" aims to raise awareness of the importance of sustaining healthy ecosystems and human well-being. By encouraging people around the world to engage in proactively improving soil health, the campaign also aims to fight soil biodiversity loss.

Threats to soil biodiversity

Although soils are essential for human well-being and the sustainability of life on the planet, they are threatened by human activity, climate change and natural disasters.

The overuse and misuse of agrochemicals remains one of the major drivers to soil biodiversity loss, thus reducing the potential of soil biodiversity for a sustainable agriculture and food security. Other threats include deforestation, urbanization, soil structure degradation, soil acidification, pollution, wildfires, erosion, and landslides, among other issues, the agency alerts.

Soils and climate action

Nature-based solutions involving soil microorganisms have a significant potential to mitigate climate change. They play a key role in carbon sequestration and reducing greenhouse gas emissions. The report also found that farming activities are the biggest source of carbon dioxide and nitrous oxide gases emitted by soils, which derive from the overuse or misuse of nitrogen-containing fertilizers.

Future steps

Generally, there is a lack of detailed data, policies and actions on soil biodiversity at local, national, regional, and global levels. The report highlighted the need to promote the necessary shift to include biological indicators of soil health along with physical and chemical ones.

According to the report, the adoption of sustainable soil management practices by farmers, as a basic premise for preserving soil biodiversity, remains low due to the lack of technical support, provision of incentives and enabling environments, and needs to be scaled up.

Looking back: How did climate change alter the world this year?

https://www.downtoearth.org.in/ 15-december-2020

A look back at 2020 evokes an unsettling picture: It was, after all, the year when the novel coronavirus SARS-CoV-2 held the world by a thread, causing massive economic setbacks and upending lives. At the same time, the climate crisis — while it took a backseat in the face of the health crisis — continued to contribute to volatile weather events.

Optimism had prevailed when the lockdown was announced; observers believed that the shutting down of all economic activities to curb the spread of the virus would bring down the greenhouse gas (GHG) emissions.The belief, however, was only a blip in the long-term GHG emission trends, as the latest State of the Global Climate provisional report by World Meteorological Organisation (WMO) found. It was published December 1, 2020.

The report stated that the reduction in GHG gases "will be practically indistinguishable from the natural inter-annual variability, driven largely by the terrestrial biosphere." It added that the real-time data from specific locations indicated increasing levels of carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O) in 2020.

CO2, CH4 and N2O are the three primary GHGs that cause anthropogenic global warming. N2O seems to be becoming the next big concern in terms of its increasing concentrations in the atmosphere and global warming potential.

Human emissions of N2O — which is 300 times more potent than CO2 — increased by 30 per cent between 1980 and 2016, according to a research paper published in Nature October 7, 2020.

Nitrous oxide is a dangerous gas for the sustainable existence of humans on Earth. It has the third-highest concentration — after CO2 and methane — in our atmosphere among greenhouse gases responsible for global warming.

N2O can live in the atmosphere for up to 125 years. Its global concentration levels increased from 270 parts per billion (ppb) in 1750 to 331 ppb in 2018 — a jump of 20 per cent. The growth has been the quickest in the past five decades because of human emissions.As the GHG emissions continue to be on the rise Earth is also getting warmer. The development has spiralled into motion several catastrophic events this year alone.

Global temperature rise

The planet was warmer by 1.2 degrees Celsius from January to October in 2020 than the pre-industrial average measured between 1850 and 1900, according to the Nature report. This is the second-warmest recorded when compared to similar periods in historical data.

The year is on course to become the third-warmest year on record. The record heat in 2020 has been despite near-La Niña conditions prevailing in the equatorial Pacific Ocean since August and moderate La Niña conditions prevailing since late September.

The La Niña phase of the El Niño Southern Oscillation (ENSO) phenomenon has a cooling effect on many parts of the world. The warmest year on record was 2016, which had very strong El Niño conditions which is the warming phase of the ENSO. This portends that 2020 has been almost as warm as 2016, if not for the opposing ENSO conditions in both year.

In fact a WMO report in July stated that one of the next five years may be witness to global average temperatures of 1.5 degree Celsius above pre-industrial levels. There is a 20 per cent possibility of the event.

The report titled The Global Annual to Decadal Climate Update added that the global average temperature rise would likely be above 1°C in each of the next five years.

Organic Farming

Organics Continue to Make Gains in California

http://organicfarmermag.com/15-december-2020

Farm gate sales of California organic agriculture more than doubled in a three year period from 2013 to 2016 as the California organic farming industry saw increases in both acreage and the number of organic growers, according to the UC Agricultural Issue Center's recently released "Statistical Review of California Organic Agriculture." The report, which covers the period from 2013 to 2016 shows the total number of organic growers in California grew by 1,020 and the total number of organic acres farmed grew by 927,924, while farm gate sales nearly doubled during the four year period from $1.54 billion in 2013 to $3.12 billion in 2016.

By the Numbers

The total number of organic growers in California grew by 1,020 from 2013 to 2016, and the review noted that some growers produce commodities in more than one group. Fruit and nut crop growers led that growth each year, gaining 545 new growers from 2013 to 2016, while pasture and rangeland growers were the least abundant, gaining four new growers.

The Central Coast region, which includes Del Norte, Humboldt, Mendocino, Lake, Sonoma and Napa counties, had the most organic growers in each year of the review.

Acreage

The total number of organic acres farmed in California grew by nearly a million acres from 2013 to 2016. Pasture and rangeland produced the most organic acreage each year, but the review shows that there were large up-and-down fluctuations across those years. Overall, pasture and rangeland experienced the highest net gain with 556,947 new organic acres from 2013 to 2016.

Up-and-down fluctuations can also be seen by region for organic acreage. The San Joaquin Valley region experienced this especially, but still saw an overall net gain of 436,198 new organic acres from 2013 to 2016.

Farm Gate Sales

According to the review, California organics produced over $10 billion in total revenue from 2013 to 2016. Vegetable crops produced the most revenue each year with $3.77 billion in total revenue from 2013 to 2016, while pasture and rangeland produced the least amount with $9.07 million in total revenue.

The San Joaquin Valley region, which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and Kern counties, produced the most revenue in each year of the review with $3.22 billion in total revenue from 2013 to 2016. The Cascade-Sierra region, which includes Trinity, Siskiyou, Modoc, Shasta, Lassen, Plumas, Sierra, Nevada, Placer, El Dorado, Alpine, Amador and Calaveras counties, produced the least revenue in each year of the review with $140 million in total revenue from 2013 to 2016.

What Does It All Mean?

The statistical trends in the review show large increases in organic growers, acres and farm gate sales. Even though these trends are from 2013 to 2016, Muramoto says he's still seeing similar trends today in the organic farming industry.

In a recent press release from the Organic Trade Association , the organization stated that organic sales across all states, not just California, were up by 4.6% in 2019 from the previous year. Statistics like these and the ones found in the review made my Muramoto and his team show that consumers are seeking out the Organic label more than ever, and future statistical reviews will be able to provide even more insight into the sector's growth.

Significance of the Review

The late Karen Klonsky, a UCCE specialist who passed away in 2018, spearheaded the initial publications for statistical reviews of California organic agriculture in 1998, six years after the data became available as a result of the California Organic Food Act. Klonsky saw the need for a display of this data for the industry and published reviews that contained statistics all the way through 2012. All previous organic agriculture statistics reviews can be accessed at aic.ucdavis.edu/research1/organic.html.

The review summarized by Muramoto and his colleagues aims to continue Klonsky's work. "This is the most comprehensive statistical review of California organic agriculture at the state and county levels," Muramoto said. "Because we use her [Klonsky's] format, we are able to compare this data to her past reviews."

The statistics review provides several functions: it helps project future trends of organic crops by commodity groups; influence strategy and policy for organic sectors in each county; and improve researchers' understanding of specific needs and dynamics of particular organic sectors.

"Accurate data on past trends and the current status [of organic farming] is crucial to develop an effective strategy for the future," Muramoto said. "For example, the number of organic farms [by county] is highest in San Diego and is still increasing. They don't

necessarily produce the highest revenue per grower because they are mostly small farms; yet they play important roles in local food systems now and probably will in the future."

As for publications made more recently and future ones, there will be more published by CDFA, according to Muramoto, but there are some continuity issues due to the way data is being collected.

"More recent years are not included [in our report] because the data collected by CDFA changed the crop category in 2017 and again in 2019, so they are not comparable to the data in this report," Muramoto said. "They did this to reduce the burden of growers in reporting, but it made a data gap consequently. Now, CDFA is trying to match the categories with the Ag census."

The most recent CDFA reviews of organic statistics are the "California Agricultural Organic Report, 2018-2019" by CDFA and the "2019 Organic Survey" by USDA-NASS.

Growing Organic Vegetables with Dry-Farming Practices

http://organicfarmermag.com/15-december-2020

As climate change warms our planet, the ability to farm with less water is becoming increasingly imperative. Reduction of available summer water because of reduced snowmelt and drought is affecting food security. Farmers and researchers are working together to gain knowledge and come up with strategies for growing food with little or no irrigation.

The idea for dry-farming is simple: hold the water that falls during the rainy season in the soil so it's available for plants that grow primarily during the dry summer. Dry-farming can be successful in areas that receive at least 20 inches of annual rainfall, such as the Pacific Northwest.

"There is a suite of practices to conserve water for our summer crop growth," said Amy Garrett, Oregon State University (OSU) Extension Associate Professor of Practice, Small Farms Program.

The three main strategies for dry faming are:

1) Using a tillage system;

2) Protecting the soil surface; and 3) Choosing drought-resistant plant varieties.

These strategies work on land that has deep soil with good water retention. If soil is lacking such qualities, be it rocky or sandy, it can be amended with the addition of organic matter such as compost, growing cover crops and/or carefully managed livestock grazing, which recycles the cover crop into manure. The roots of dry-farmed vegetables seek moisture and

grow deeper than irrigated crops. To look at the soil texture and moisture content at root level, take a 5- or 6-foot core sample.

Time the Tillage

Use careful timing. When you work the soil, do so in the early morning hours before the area is hit with direct sunlight and while there is still dew on the ground.

As far as seasonal timing of tillage, Garrett said, “We are starting as early as possible. We will typically flail mow our cover crop much earlier than irrigated farmers because as rain starts to slow down, the soils start to dry. We mow the cover crops in March or April when they are about knee high. We usually get a dry window sometime in the spring – as early as April, depending on soil type and microclimate, sometimes as late as the second week of May. We typically plant in May when there is still moisture in the soil. It’s important to put that seed in contact with moist soil.”

Cultivate the Soil Surface

Keep soil surfaces loose. It conserves moisture down at the root zone. Uncultivated soil tends to dry out and crack. Cracks in the soil open up and start drying out the deeper soil.

“Organic farmers are cultivating to manage their weeds,” Garrett said. “Some farmers in California cultivate five to six inches deep. It prevents this crusting and cracking from happening.”As with any farming practice, improving the soil is key. “Anything we can do to improve soil quality is very important for dry-farming,” Garrett said.

Growers can also use organic mulches such as leaves, wood chips or straw. There are two drawbacks to these deep mulches: They cool the soil temperature. This could inhibit the germination of some direct-seeded crops such as melons and squash, in which case a transplant might work better. And the mulch may attract pests such as slugs, snails, mice and voles.“We are looking into the benefits of deep mulch. A lot of people are experimenting,” Garrett said. “We’re just starting to analyze the data for leaf mulch.”

Plant Varieties

Some of the plants which have been grown successfully with dry-farming methods include drought-tolerant varieties of dry beans, melons, potatoes, squash – including winter squash and zucchini – flour corn and tomatoes.

A good source for dry farm seed is Seed rEvolution Now. Sundial Seed Company is another source. Both companies are located in California.

Garrett and others involved in Pacific NW growing trials have shown success with watermelon variety Christmas. “It’s one of our favorites,” Garrett said, adding that although some dry-farmed watermelons tend to get mealy or pithy, she’s never heard negative feedback about Christmas, at least not as far as taste. Oregon Coastal dry farm collaborators didn’t have enough hot, sunny summer days for Christmas to ripen in the Astoria, Ore. area. Other dry farm varieties that have proved themselves worthy in taste and performance are Dark Star zucchini and Stella Blue winter squash.

Early Girl tomato is grown with success by dry-farmers in Coastal Northern California. In the Oregon Willamette Valley, the summer humidity is too low, and Early Girl tends to get

blossom end rot. Next summer, a dry-farm trial will happen in Oregon with 200 different varieties of tomatoes.

Since 2015, growers and researchers have been conducting variety trials. Included in the trials are a number of potatoes, several varieties of delicata winter squash, and maxima squash, which is a Hubbard type. Before COVID-19, the Dry-farming Collaborative (DFC) hosted farm tours along with taste tests with tomatoes and melons from both dry-farms and irrigated farms set out side by side. This year, the DFC hosted nine virtual farm tours.

Dry-Farm History and Research

Dry-farming is not a new way of farming, but rather a return to an old way that has been passed down from one farmer to the next. Only a small number of farmers experiment with dry-farming. Even fewer have extensive experience at it.

The farmers and researchers behind the DFC, OSU Extension Dry-Farm Project and Community Alliance with Family Farmers (CAFF) have expanded that knowledge. Their studies, led by Garrett, started in 2013 on Western Oregon and Northern California farms.

“We started out with case studies with farmers who had been doing this for a long time,” Garrett said. When she began her research into dry-farming, there wasn’t any information available through OSU, and no extension publications. “I’ve been kind of on a mission to raise awareness of the practices.”

During the drought of 2015, there were about 100 people who attended the dry-farm summer demonstration. “Many people had their wells run dry that year. There was a real concern with people about water,” Garrett said.

Getting Started

Dry-farming has definite benefits. Winter squash from dry-farming will store longer than its irrigated counterparts. Dry-farmed produce also has more flavor. Besides producing more flavorful produce, which could command a higher price, dry-farming works in harmony with nature by growing food in a more sustainable way than conventional, irrigated farming. In addition to using less water, dry-farming also uses less fertilizer and labor. There are fewer problems with annual weeds and, although tough perennials such as bindweed and Canadian thistle may persist. Dry-farming practices also protect carbon reserves in the soil.

The major downside to dry-farming is decreased yields. In some cases, yield reduction can be 25% to 50% lower when compared to irrigated crops.

“The best way to begin dry-farming is to start small, Garrett suggests. “Maybe just two or three rows.”

During the DFC winter meeting, “We all come together and talk about what worked and what didn’t,” Garrett said. The meeting will be virtual this year. “Opportunities are coming up. We’d like to find farmers who would like to join us, gather some ideas of things they’d like to try.”

Organic farming along Ganga banks soon

https://timesofindia.indiatimes.com/29 December 2020

PRAYAGRAJ: Under the Namami Gange scheme, the agriculture department would be promoting organic farming in 112 grams sabhas along the banks of the ganges.This concept of organic farming would be made by forming clusters of 50 acres and for this,the faremrs would be given a grant of Rs.14500 per hectare.Besides the Agriculture department will provide different inputs free of cost apart from organic farming equipments,cow dung fertilizer,seeds etc to the farmer.

This is a three year programme of the government under Nnamami Ganges scheme wherein we have identified 112 villages that lies besides the banks of river Ganga

ICAR In Print

ICAR bags global award from FAO for creating awareness about soil health

THE EconomicsTimes December 05, 2020

NEW DELHI: India's agri-research body Indian Council of Agricultural Research (ICAR) on Sunday said it has bagged the prestigious 'International King Bhumibol World Soil Day Award' from the United Nation's Food and Agriculture Organization (FAO) for raising awareness about importance of soil health among all stakeholders.The award was conferred to ICAR on the occasion of World Soil Day, celebrated on December 5, through a virtual function, ICAR said in a statement. The award was conferred to ICAR on the occasion of World Soil Day, celebrated on December 5, through a virtual function, ICAR said in a statement.

India bagged the award for ICAR's awareness initiative undertaken in December 2019, involving participation of more than 13,000 people through a social media campaign.Princess Maha Chakri Sirindhorn of Thailand will give the award to ICAR in an official ceremony to be held in Bangkok in January 2021. ICAR said it organised interactive sessions in universities, awareness-raising activities in schools, exhibitions, screenings, field visits and training sessions, and reached out to all soil stakeholders in the country as part of its awareness programme.

ICAR placed particular emphasis on youth by raising awareness about importance of soil

for food security and climate change mitigation through quizzes, debates and on-site demonstrations.ICAR is responsible for coordination, guidance and management of agricultural research and education in India.

IIHR commercializes probiotic fruit beverage technology

The Hindu 30 Dec 2020

ICAR-Indian Institute of Horticulture Research, Bengaluru has commercialised its technology to manufacture probiotic pineapple beverage to a Mysuru based start-up Makers of Mysuru Pvt Ltd.

MR Dinesh, Director, IIHR said the technology to manufacture probiotic pineapple beverage is the first such technology to be commercialised by the institute. The probiotic fruit bevereage technology was developed by a team of scientists from the Post Harvest Technology and Agri Engineering division of IIHR led by Harinder Singh Oberoi. “It took almost three years for us to develop and standardise this technology,” Oberoi said. The beverage does not contain any artificial chemicals or preservatives, he said.

Chetan Gowda, MD of Makers of Mysuru, said that the company expects to launch the beverage before March 2021. The company, which manufactures kokum-based products, is in the process of adding new machinery for the commercialisation of the pineapple beverage, which needs a cold supply chain.

Dinesh said IIHR is also looking at commercialisng the technology among entrepreneurs in the North-East, which is a major producing area for pineapples. “We have sounded out the Krishi Vigyan Kendras in the North-East to create awareness about this technology,” he said.

IIHR has also developed technologies for producing probiotic mango and pomegranate beverages, which has evoked interest from entrepreneurs. “We hope to commercialise them soon,” Dinesh said.

ICAR bags global award from FAO for creating awareness about soil health

economictimes.indiatimes.com Dec 06, 2020

ICAR bags global award from FAO for creating awareness about soil health Synopsis India's agri-research body Indian Council of Agricultural Research said it has bagged the prestigious 'International King Bhumibol World Soil Day Award' from the United Nation's Food and Agriculture Organization (FAO) for raising awareness about importance of soil health among all stakeholders. NEW DELHI: India's agri-research body Indian Council of Agricultural Research (ICAR) on Sunday said it has bagged the prestigious 'International King Bhumibol orld Soil Day Award' from the United Nation's Food and Agriculture Organization (FAO) for raising awareness about importance of soil health among all

stakeholders. The award was conferred to ICAR on the occasion of World Soil Day, celebrated on December 5, through a virtual function, ICAR said in a statement. India bagged the award for ICAR's awareness initiative undertaken in December 2019, involving participation of more than 13,000 people through a social media campaign. Princess Maha Chakri Sirindhorn of Thailand will give the award to ICAR in an oicial ceremony to be held in Bangkok in January 2021. Participate in the world's largest coding championship Ad MAKEBOT VISIT SITE Sponsored by ICAR said it organised interactive sessions in universities, awareness-raising activities in schools, exhibitions, screenings, eld visits and training sessions, and reached out to all soil stakeholders in the country as part of its awareness programme. ICAR placed particular emphasis on youth by raising awareness about importance of soil for food security and climate change mitigation through quizzes, debates and on-site demonstrations. India bagged the award for ICAR's awareness initiative undertaken in December 2019, involving participation of more than 13,000 people through a social media campaign. ICAR is responsible for coordination, guidance and management of agricultural research and education in India

IISR In Print

Organic farming model of spices research body gets national recognition

THE HINDU DECEMEBR 04 2020

The integrated farming model and organic agriculture packages introduced by Indian Institute of Spices Research is proving to be a successful model among the farming and research communities across the country. The successful implementation of the organic farming method, combined with organic package preparation and experimental farming has helped IISR become the Best Centre of All India Network Programme on Organic Farming (AI-NPOF) under ICAR for 2020. The network project on organic farming developed by Indian Institute of Farming Systems Research focuses on promoting organic cultivation of spice crops with the help of research institutes. IISR has been part of the network project on Organic Farming since 2012. An integrated farm has been set up on the Chelavoor Campus of the institute as part of the Integrated Organic Farming System (IFS). According to the scientists of IISR, the integrated farm inter crops coconut trees with turmeric, tapioca, banana, cow pea and fodder grasses and also manage cattle to ensure the supply of cow dung as organic manure. IISR has set up this farm as a model farm for small and marginal farmers who want to generate a decent income along with ensuring food crops for household use.

Two Holstein Friesians (HF) cows and their calves and a jersey cow are part of the IFS. Besides, the institute rears indigenous cattle breeds Kasaragod dwarf and Vechoor cow also. The cow milk from the cattle unit is sold out to the public at a counter. The Institute could also able to generate an income by selling other food crops. IISR generated a profit of ₹1.3 lakh from one acre integrated farm, scientists said.

The organic friendly initiatives introduced by a team including CK Thankamani, Principal Investigator, V Srinivasan, S Shanmughavel, R Praveena and S Sarathambal helped the institute to bag the award.

The role of the institute in popularising organic packages among the farm communities also helped the team to bag award. The successful demonstration of organic turmeric cultivation with the help of women Self Help Group under Kavunthara cooperative bank also helped the institute.

IISR team inspects crops at Kattippara

www.thehindu.com DECEMBER 29, 2020

Experts provide on-the spot solutions to variety of agriculture-related problems

In connection with Swachhata fortnight celebrations, a team of scientists and technical personnel from ICAR-Indian Institute of Spices Research, Kozhikode, conducted crop surveillance and monitoring visit to Kattippara on Tuesday.

Kattippara is one of the villages adopted by the institute under 'Mera Gaon Mera Gaurav' (My Village My Pride) programme. The volunteers visited the farmers' plots including kitchen gardens, paddy lands, banana plantations, and vegetable gardens, a statement said.

On the occasion, the farmers were educated about the technologies from the institute besides emphasising the significance of Swachhta Mission for maintaining the village clean and green. The villagers were also enlightened about the importance of maintaining cleanliness in their day-to-day life and in homesteads, besides emphasising the ill-effects of plastic which cause hazardous impacts on the environment.

Also, on-the spot solutions were also provided for effective, economic and eco-friendly management of pests and diseases of various horticultural crops, including spices. Efficient utilisation of organic waste and generation of wealth from waste by promoting clean and green technologies through organic farming practices were also highlighted on the occasion.

The field visits were organised in collaboration with the Krishi Bhavan, Kattippara, and coordinated by K. K. Muhammad Faisal (Agriculture Officer), K. Jamsheena (Agriculture Assistant), N. K. Velayudhan and K. T. Joseph (Haritha Cluster).

General

Light signal emitted during photosynthesis used to quickly screen crops

ScienceDaily December 21, 2020, 08.58 PM IST

An international effort called Realizing Increased Photosynthetic Efficiency (RIPE) aims to transform crops' ability to turn sunlight and carbon dioxide into higher yields. To achieve this, scientists are analyzing thousands of plants to find out what tweaks to the plant's structure or its cellular machinery could increase production. University of Illinois researchers have revealed a new approach to estimate the photosynthetic capacity of crops to pinpoint these top-performing traits and speed up the screening process, according to a new study in the Journal of Experimental Botany.

"Photosynthesis is the entry point for carbon dioxide to become all the things that allow plants to grow, but measuring canopy photosynthesis is really difficult," said Carl Bernacchi, a Research Plant Physiologist for the U.S. Department of Agriculture, Agricultural Research Service, who is based at Illinois' Carl R. Woese Institute for Genomic Biology. "Most methods are time-consuming and only measure a single leaf when it's the function of all leaves on all plants that really matters in agriculture."

Bernacchi's team uses two spectral instruments simultaneously -- a hyperspectral camera for scanning crops and a spectrometer used to record very detailed information about sunlight -- to quickly measure a signal called Solar Induced Fluorescence (SIF) that is emitted by plants when they become 'energy-excited' during photosynthesis.

With this SIF signal, the team gains critical insights about photosynthesis that could ultimately lead to improving crop yields.

They discovered that a key part of the SIF signal better correlates with photosynthetic capacity. This 'SIF yield' accounts for only a fraction of the energy emitted as SIF by plants to the energy captured by plants in total, but it carries important information.

"With this insight, we can use a couple of instruments in a synergistic way to make more accurate estimates, and we can make these tools and pipelines more accessible to people who are interested in advancing the translation of photosynthesis," said Peng Fu, a postdoctoral researcher who led this work at Illinois.

In this study, they picked out specific bands of light that are known to be linked to SIF (and are already well understood physiologically) to better understand what hyperspectral data is actually needed to make these estimates.

In the past, they relied on expensive hyperspectral cameras that captured thousands of bands of light. "However, this study suggests that much cheaper cameras could be used

instead now that we know what bands of light are needed," said Matthew Siebers, a postdoctoral researcher at Illinois.

These tools could speed up progress by orders of magnitude, said Katherine Meacham-Hensold, also a postdoctoral researcher at Illinois. "This technology is game-changing for researchers who are refining photosynthesis as a means to help realize the yields that we will need to feed humanity this century."

Realizing Increased Photosynthetic Efficiency (RIPE) is an international research project that is improving photosynthesis to equip farmers worldwide with higher-yielding crops to ensure everyone has enough food to lead a healthy and productive life. RIPE is supported by the Bill & Melinda Gates Foundation, the U.S. Foundation for Food and Agriculture Research, and the U.K. Foreign, Commonwealth & Development Office, who are committed to ensuring Global Access and making the project's technologies available to the farmers who need them the most.

IIT-Ropar, IIT Alumni Council to jointly set up Global Centre of Excellence

The Hindu-01-Dec-2020

IIT-Ropar on Tuesday announced its partnership with IIT Alumni Council to set up first Global Centre of Excellence (GCE) in the area of agritech and water.This will be the first such GCE under the India Innovation Network (i2Net) initiative set up by IIT Alumni Council.

The core area of focus for the GEC will be agritech and water with multi-disciplinary support from artificial imaging, computer vision, IoT sensors, chemical engineering, nuclear physics etc.Notably, IIT-Ropar had recently received ₹110 crore worth of projects for agriculture and water from Department of Science and Technology.

The GEC will complement the ₹110-crore Technology Innovation Hub - AWaDH – Agriculture & Water Technology Development Hub - established at IIT-Ropar under the National Mission of the Department of Science and Technology.As part of an agrarian State, it has been one of the mandates of IIT-Ropar to take up research aimed at addressing water-agriculture related issues.

Sarit K Das, Director, IIT-Ropar, said, “We are looking forward to leading globally in research for Agritech and Water. By optimally exploiting the new paradigms emerging from the deployment of artificial intelligence, remote sensing and genomics, we are uniquely positioned to blend tradition with technology in a very different way.”India Innovation Network initiative is to build a fifty- institution ecosystem to revitalise research in India by building capacities, improving quality of researchers through better linkages globally and enhancing the brand value of India in general and the IITs and i2Net institutions in particular, a statement said. GCE is a part of it.

Ravi Sharma, President of the IIT Alumni Council, said, “IIT Alumni Council has taken up the vision to develop India as a leading location for high science research by creating an end-to-end ecosystem with revenue target of ₹50,000 crore per annum and 100,000 researchers within five years.”IIT Alumni Council will facilitate the investment of ₹40 crore in GCE Punjab through Pan-IIT Institute and MegaFund.

Agriculture 2.0

It will help India leapfrog to Agriculture 2.0 by increasing productivity, reducing chemical fertiliser and pesticide levels, managing water resources and creating better linkages with markets and direct consumers using disintermediation platforms, the statement said.“The agritech and water ecosystem being co-created along with existing research and academic institutions will lay the foundation for Agriculture 2.0. In addition to revitalising the agriculture economy, the research initiative will also help create a contract and funded research ecosystem capable of earning substantial foreign exchange,” Sharma stated.IIT Alumni Council is the largest global body of alumni, students and academicians across all the twenty-three IITs and partnering I2Net.

FSSAI asks food commissioners to crackdown on spices adulteration

https://economictimes.indiatimes.com/December 29, 2020

Food regulator FSSAI on Tuesday asked state food commissioners to conduct effective enforcement drive to check adulteration in spices. In a letter to Commissioner of Food Safety of all States/UTs, the Food Safety and Standards Authority of India (FSSAI) said that there have been media reports about sale of adulterated spices in the domestic market.

"Instances have been reported recently in media regarding the sale of adulterated spices in domestic market. As per one such report, the spices like dhaniya powder is being adulterated with bajra and dhaniya stem whereas turmeric powder is being adulterated with broken rice which is mixed with yellow colour," FSSAI said in the letter.The regulator asked state food commissioners to conduct an effective enforcement drive to check the adulteration of commonly used spices like haldi, dhaniya, lal mirch powder etc in wholesale markets/mandis under their jurisdictions.

"Further, the necessary action as deemed fit may be initiated against the defaulting Food Business Operators as per the provision laid down under the Food Safety and Standards Act, 2006, Rules and Regulations 2011 made thereunder," FSSAI said.

Tuck into turmeric: Chemicals in spices, fruit and veg could help tackle Covid

irishnews.com 24 December, 2020

The spice turmeric, along with chamomile tea and pomegranate, could be among the latest weapons in the battle against the coronavirus

Turmeric root and turmeric powder – the spice contains phytochemicals which it is hoped may help to reduce the coronavirus's ability to replicate and penetrate cells

Quercetin, another phytochemical, is found in pomegranate

ALTHOUGH the race to produce a vaccine has proved fruitful, there is still some way to go until a Covid jab is available to everyone. Which is why scientists are busy looking at ways to improve the outlook for anyone unlucky enough to be infected with the coronavirus – or any future virus. One major area of interest concerns diet and lifestyle.

"The majority of people seriously affected by Covid have co-existing conditions, such as heart disease, type 2 diabetes or being overweight, which are usually rooted in poor diet and a sedentary lifestyle," says consultant oncologist Professor Rob Thomas, who has previously studied the role of diet in reducing the risk of different types of cancer.

"So it makes sense to investigate how lifestyle changes can help to improve our immunity and ability to fight back against infection."

There is much evidence to suggest that vitamin D can help protect against Covid, with studies revealing that people who lack the 'sunshine vitamin' (a common complaint in these islands during winter) were more likely to become seriously ill if they caught the virus.

Researchers are also studying whether phytochemicals may help – these powerful, naturally occurring compounds found in fruit, vegetables, herbs and spices have already been found to reduce the risk of cancer and other serious degenerative diseases. The largest trial of this type, the Phyto-V study, is now under way at Bedford Hospital, in England, led by Prof Thomas.

It examines phytochemicals already known to help prevent the spread of SARS (a form of viral pneumonia closely related to Covid-19), including hesperetin (found in citrus fruits), catechin, and quercetin (in pomegranate), aloe emodin (in aloe vera), curcuminoids (in turmeric) and apigenin (in chamomile tea).

In lab and animal trials conducted during the SARS outbreak in 2003, these were shown to reduce the virus's ability to replicate and penetrate cells. Now, the Phyto-V trial is comparing the outcome of Covid-19 patients given these phytochemicals as a supplement with others given a placebo.

Patients will take the supplement for at least a month and will be monitored until their symptoms disappear (for people with 'long Covid' this could be around three months). The study is still recruiting volunteers and results are expected next year.

Similar studies using minerals and other phytochemicals are under way in India, Spain and the Middle East.

"Supplements made from concentrated phytochemicals are safe, can be developed rapidly and are readily available,'" says Prof Thomas.

"Their regular intake has been found to have multiple health benefits, particularly reducing chronic degenerative disease, including my own specialism of cancer, and excess chronic inflammation."

In addition to a weakened immune system, chronic inflammation is now thought to be the underlying factor in a range of serious diseases, including cancer, arthritis, heart disease, type 2 diabetes and dementia. Prof Thomas adds: "Laboratory studies investigating a range of herbs and plants have also reported potential direct anti-viral properties."

Human trials are also looking at whether phytochemicals can reduce the chance of catching Covid-19 in the first place.

Key to the research is the fact that a diet high in meat and sugary foods and which does not contain enough phytochemicals is linked to poor gut health, and this can have an impact on the overall immune system.

On the other hand, a diet rich in phytochemicals – responsible for giving fruit, vegetables, spices and herbs their flavours and colours – has been shown to improve gut health, so improving immunity.

Scientists in Malaga, Spain, are also studying how a twice-weekly, 50-minute programme of strength and aerobic exercises can enhance recovery from the coronavirus.

The push is important as recent studies have found the pandemic has led to weight gain and an increase in sedentary lifestyles.

Nearly half of adults in the UK put on weight during the first lockdown, according to research by King's College London and Ipsos MORI.

Simon Clarke, an associate professor in cellular microbiology, says: "A lot is talked about boosting your immune system, but if this trial is based on ingredients with proven anti-viral properties, then the results could be very interesting.

"After all, a lot of the chemicals we use in medicine originally came from plants, so it's entirely possible that there are new discoveries to be made in this area."

Malayalam News

കാർഷിക വിദഗ്ധർക്ക് കാർഷിക കൗൺസിൽ; സുപ്രധാന നീക്കവുമായി ആന്ധ്രപ്രദേശ്.

മനോരമ DECEMBER 05, 2020.

കാർഷികമേഖയിൽ സുപ്രധാന നീക്കവുമായി ആന്ധ്രപ്രദേശ് സർക്കാർ. കഴിഞ്ഞ ദിവസം ആന്ധ്രപ്രദേശ് നിയമസഭയിൽ പാസാക്കിയ അഗ്രിക്കൾച്ചറൽ കൗൺസിൽ ബിൽ 2020 ആണ് കാർഷികമേഖലയിൽ പുതിയൊരു മാറ്റത്തിന് വഴിവച്ചിരിക്കുന്നത്. കാർഷികമേഖലയിലെ വിദഗ്ധരെ ഒരു കൗൺസിലിനു കീഴിലാക്കാനുള്ള സുപ്രധാന തീരുമാനമാണിത്. ഇത്തരത്തിലൊരു കൗൺസിൽ

രൂപീകരിക്കുന്ന രാജ്യത്തെ ആദ്യ സംസ്ഥാനമാണ് ആന്ധ്രപ്രദേശ്. സ്വതന്ത്ര ഭരണ സംവിധാനമുള്ള സംഘടനയായിരിക്കു. അഗ്രിക്കൾച്ചറൽ കൗൺസിലെന്ന് ബിൽ അവതരിപ്പിച്ച കൃഷി മന്ത്രി വെളിപ്പെടുത്തുകയും ചെയ്തു.

ആരോഗ്യ, ദന്ത, നഴ്സിങ് കൗൺസിലുകൾ പോലെതന്നെയാണ് ഇതിന്റെയും പ്രവർത്തനം. കൂടാതെ കാർഷിക ബിരുദധാരികൾ, സംരംഭകർ, ഗവേഷണം, വികസനം,മാർക്കറ്റിങ് എന്നിങ്ങനെ കാർഷികമേഖലയുമായി ബന്ധപ്പെട്ടുള്ളതെല്ലാംകൗൺസിലിന്റെ കീഴിലാകും. ദീർഘനാളായുള്ള ആവശ്യമായിരുന്നു കാർഷികമേഖലയ്ക്കൊരു കാർഷിക കൗൺസിൽ എന്നത്. കുറഞ്ഞത് 5 സംസ്ഥാനങ്ങളിലെങ്കിലും ഇത്തരത്തിൽ കാർഷിക കൗൺസിലുകൾ രൂപീകരിച്ചെങ്കിൽ മാത്രമേ ദേശീയ തലത്തിൽ കാർഷക കൗൺസിൽ രൂപീകരിക്കാൻ കഴിയൂ. ആന്ധ്രപ്രദേശ് ഇതിന് തുടക്കമിട്ടുകഴിഞ്ഞു– മന്ത്രി കെ. കണ്ണബാബു നിയമസഭയിൽ പറഞ്ഞു.

കൗൺസിലിന്റെ ഭരണഘടന വൈകാതെ തയാറാകും. കാർഷിക ബിരുദധാരികൾ കൗൺസിലിൽ റജിസ്റ്റർ ചെയ്തിരിക്കണം.റജിസ്റ്റർ ചെയ്യുന്നവർക്ക് ഐഡന്റിറ്റി നമ്പർ അഥവാ റജിസ്റ്റർ നമ്പർ നൽകും. സ്വകാര്യ പ്രാക്ടീസുകൾ അനുവദിക്കും. എന്നാൽ, അഴിമതി, നിയമം ലംഘിച്ചുള്ള പ്രവർത്തനങ്ങൾ, അധാർമിക രീതികൾ തുടങ്ങിയവയൊന്നും അനുവദിക്കില്ല. ഇത്തരം കുറ്റകൃത്യങ്ങൾ ചെയ്യുന്നവരുടെ റജിസ്ട്രേഷൻ റദ്ദാക്കും. ഒപ്പം കാർഷികമേഖലയിൽ പ്രവർത്തിക്കുന്നതിൽ നിന്ന് വിലക്കുകയും ചെയ്യുമെന്ന് മന്ത്രി അറിയിച്ചു. കാർഷിക കോളജുകൾ, യൂണിവേഴ്സിറ്റികൾ ഗവേഷണ സ്ഥാപനങ്ങൾ തുടങ്ങിയവയെല്ലാം അഗ്രികൾച്ചറൽ കൗൺസിലിന്റെ കീഴിലായിരിക്കുംപ്രവർത്തിക്കുക.
അതേസമയം,കേരളത്തിലുംഇത്തരത്തിലൊരുകൗൺസിലിന്റെയും റജിസ്ട്രേഷന്റെയും ആവശ്യമുണ്ടെന്ന് വിദഗ്ധർ പറയുന്നു. ഇത്തരം കാർഷിക വിദഗ്ധർ കർഷകർക്ക് വളം, മരുന്ന് തുടങ്ങിയവ നിർദേശിക്കുമ്പോൾതങ്ങളുടെറജിസ്ട്രേഷൻനമ്പരും പ്രയോഗിക്കേണ്ട അളവും കൃത്യമായി രേഖപ്പെടുത്തി നൽകണമെന്നാണ് കേരളത്തിലെ കാർഷിക മേഖലയിലുള്ളവരുടെഅഭിപ്രായം.

കുട്ടികളിൽ പോഷകാഹാരം ഉറപ്പാക്കാൻ പോഷകാഹാരത്തോട്ടം പദ്ധതി

Dec 23, 2020, 08:53 PM IST

A | A | A

പദ്ധതിപ്രകാരം പോഷകാഹാരത്തോട്ടം സ്ഥാപിക്കുന്നതിന് വർഷം മുഴുവൻ പിന്തുണ ലഭിക്കും. അടുത്ത വർഷം പദ്ധതി മറ്റൊരു പഞ്ചായത്തിലേക്ക് വ്യാപിപ്പിക്കും.

അനുഷ ഗോവിന്ദ്

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പോഷകകലവറയായ മുരിങ്ങയില നല്ല സസ്യ ഉത്തേജകവുമാണ്. ഇന്ത്യയിൽ വിരളമാണെങ്കിലും പല ..

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പച്ചക്കറിക്കൃഷിയിലൂടെ പോഷകാഹാരം ഉറപ്പുവരുത്തുക എന്ന ലക്ഷ്യത്തോടെ പോഷകാഹാരത്തോട്ടം പദ്ധതിയുമായി കൃഷി വിജ്ഞാനകേന്ദ്രം (കെ.വി.കെ.). ആദ്യഘട്ടത്തിൽ കോഴിക്കോട് ജില്ലയിലെ കോട്ടൂർ ഗ്രാമപ്പഞ്ചായത്തിലാണ് പദ്ധതി ആരംഭിച്ചിരിക്കുന്നത്. ഭാരതീയ സുഗന്ധവിള ഗവേഷണകേന്ദ്രത്തിന്റെ അനുബന്ധ സ്ഥാപനമായ കെ.വി.കെ.യിലെ ഒരുസംഘം ഉദ്യോഗസ്ഥരാണ് പോഷകാഹാരത്തോട്ടം പദ്ധതിക്ക് മേൽനോട്ടം വഹിക്കുക.

പോഷകാഹാരലഭ്യതയിൽ ഓരോ വീടും സ്വയം പര്യാപ്തമാകുക എന്ന ലക്ഷ്യത്തോടുകൂടിയാണ് പെരുവണ്ണാമൂഴി കൃഷിവിജ്ഞാനകേന്ദ്രം പദ്ധതി ആരംഭിച്ചിരിക്കുന്നത്. കെ.വി.കെ.യുടെ ദത്തുഗ്രാമമാണ് കോട്ടൂർ. ഇതിന്റെ ഭാഗമായി പഞ്ചായത്തിലെ 25 കുടുംബങ്ങൾക്കുള്ള പച്ചക്കറി വിത്തുവിതരണവും പരിശീലനപരിപാടികളും നടത്തി. മേഖലയിലെ കുട്ടികൾക്കും കൗമാരക്കാർക്കും ഗർഭിണികൾക്കും പോഷകാഹാരം ലഭ്യമാക്കുകയെന്ന ലക്ഷ്യത്തോടെ മൂന്ന് അങ്കണവാടികളെയും പദ്ധതിയിൽ ഉൾപ്പെടുത്തിയിട്ടുണ്ട്.

നമ്മുടെ ഗ്രാമങ്ങളിൽ ആരോഗ്യകരവും പോഷകസമൃദ്ധവുമായ ആഹാരം ഉറപ്പുവരുത്താനുള്ള ഏറ്റവും മികച്ച മാർഗമാണ് പോഷകാഹാരത്തോട്ടമെന്ന് ഭാരതീയ സുഗന്ധവിള ഗവേഷണകേന്ദ്രം ഡയറക്ടർ ഡോ. സന്തോഷ് ജെ. ഈപ്പൻ പറഞ്ഞു.

മുത്തുകാട്, നടുവണ്ണൂർ ഗ്രാമപ്പഞ്ചായത്തുകളും പദ്ധതിയുടെ ഭാഗമാണ്. പോഷകാഹാര ഉപഭോഗം മെച്ചപ്പെടുത്തുന്നതിന് പോഷകാഹാരത്തോട്ടം അവരെ സഹായിക്കുന്നുണ്ടോയെന്ന് അവലോകനം ചെയ്യുന്നതിന് ഗുണഭോക്തൃകുടുംബങ്ങൾക്കിടയിൽ ഒരു പഠനവും കെ.വി.കെ. ലക്ഷ്യമിടുന്നുണ്ട്. കുട്ടികളുടെയും മുതിർന്നവരുടെയും ഭക്ഷണസമയം, പോഷകാഹാരങ്ങളുടെ ഉപയോഗം ഇവ വിലയിരുത്താനും ആവശ്യമായ മാറ്റങ്ങൾ നിർദേശിക്കാനും ഈ പഠനം സഹായകമാവും.

പദ്ധതിപ്രകാരം പോഷകാഹാരത്തോട്ടം സ്ഥാപിക്കുന്നതിന് വർഷം മുഴുവൻ പിന്തുണ ലഭിക്കും. അടുത്ത വർഷം പദ്ധതി മറ്റൊരു പഞ്ചായത്തിലേക്ക് വ്യാപിപ്പിക്കും. ഒരു വർഷം ലഭിച്ച പിന്തുണ, വരുംവർഷങ്ങളിലും പോഷകാഹാരത്തോട്ടം പദ്ധതി തുടരാൻ ഗുണഭോക്താക്കളെ

രുചികരം, പോഷക സമൃദ്ധം; ആഹാരത്തിന് പുത്തൻ ഇലവർഗം 'പാക്ചോയ്'

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കേരളത്തിൽ എളുപ്പത്തിൽ കൃഷിചെയ്യാം. നീർവാർച്ചയുള്ള മണ്ണും ആർദ്രതയുള്ള അന്തരീക്ഷവുമാണ് ഇതിന് യോജിച്ചത്. പൂർണമായി ശീതകാല വിളയല്ലെങ്കിലും പകൽ താപനില 36 ഡിഗ്രി സെന്റിഗ്രേഡിന് മുകളിലാകുന്നത് വളർച്ചയ്ക്ക് അത്ര യോജിച്ചതല്ല.

ജോസഫ് ജോൺ തെറാട്ടിൽ

പാക്ചോയ് (ബോക്ചോയ്) | ഫോട്ടോ: മാതൃഭൂമി

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ഒരാൾ നിത്യേന 300 ഗ്രാം പച്ചക്കറിയെങ്കിലും കഴിക്കണമെന്നാണ് ശാസ്ത്രലോകം നിർദേശിക്കുന്നത്. അതിൽ മൂന്നിലൊന്ന് ഇലവർഗവുമാവണം. എന്നാൽ, നമ്മൾ തീരെ കുറഞ്ഞ അളവിലേ ഇലക്കറി കഴിക്കുന്നുള്ളൂ. അതിന് പ്രധാനകാരണം ഇവയുടെ ലഭ്യതക്കുറവുകൂടിയാണ്. ചീരയാണ് നമ്മുടെ കടകളിൽ ലഭിക്കുന്ന പ്രധാന ഇനം. ബാക്കിയെല്ലാം വളരെ പെട്ടെന്ന് രുചിയിലും ഗുണത്തിലും വ്യത്യാസം വരുന്നവയാണ്. ഇവിടെയാണ് പാക്ചോയ് എന്ന പുതിയ

80 സെന്റിൽ ചീര മുതൽ കോളിഫ്ളവർ വരെ; ജൈവപച്ചക്കറിക്കൃഷിയിൽ സജീവിന്റെ വിജയഗാഥ

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80 സെന്റ് സ്ഥലം പാട്ടത്തിനെടുത്ത് കോളിഫ്ളവർ, കാബേജ്, ചീര, വഴുതന, തക്കാളി, കിഴങ്ങുവർഗങ്ങൾ എന്നിങ്ങനെ എല്ലാത്തരം പച്ചക്കറികളും നട്ടിട്ടുണ്ട്.

സജീവ് കോളിഫ്ളവർ തോട്ടത്തിൽ | ഫോട്ടോ: മാതൃഭൂമി

ജൈവകൃഷിയിലൂടെ പച്ചക്കറി ഉത്പാദനത്തിൽ വിജയകഥ രചിക്കുകയാണ് കിളികൊല്ലൂർ എൻ.കെ.നഗറിലെ സജീവ്. പലചരക്ക് കടയ്ക്കും എസ്.എൻ.ഡി.പി.യൂണിയൻ പ്രവർത്തനങ്ങൾക്കുമിടയിൽ ദിവസവും രാവിലെയും വൈകിട്ടും പച്ചക്കറിത്തോട്ടത്തിലും മറ്റുമ്മ ജോലിചെയ്താണ് സജീവ് ഈ കൃഷിഗാഥ രചിച്ചത്.

80 സെന്റ് സ്ഥലം പാട്ടത്തിനെടുത്ത് കോളിഫ്ളവർ, കാബേജ്, ചീര, വഴുതന, തക്കാളി, കിഴങ്ങുവർഗങ്ങൾ എന്നിങ്ങനെ എല്ലാത്തരം പച്ചക്കറികളും നട്ടിട്ടുണ്ട്.

ലാഭത്തേക്കാൾ വിഷരഹിത പച്ചക്കറി ഉണ്ടാക്കുന്നതിലൂടെ കിട്ടുന്ന സംതൃപ്തിയാണ് തന്നെ നയിക്കുന്നതെന്ന് സജീവ് പറയുന്നു. മാതൃഭൂമി കാർഷികരംഗവും സീഡ് പോലുള്ള പ്രവർത്തനങ്ങളും അതിന്റെ മുഖ്യപ്രചോദനമാണ്. മാതൃഭൂമി സംഘടിപ്പിച്ച ക്യാമ്പുകളിൽ പങ്കെടുത്തിട്ടുണ്ട്. അവിടെനിന്ന് കിട്ടിയ കശുമാവിൻ തൈയും പറമ്പിൽ പൂത്തുനിൽപ്പുണ്ട്.

കിളികൊല്ലൂർ കൃഷിഭവന്റെ നിർദേശങ്ങളും സ്വീകരിക്കുന്നു. അവർ പോയവർഷം മികച്ച കർഷകനായി ആദരിച്ചിരുന്നു. ഉത്പന്നങ്ങൾ എസ്.എൻ.കോളേജിനു സമീപമുള്ള ഇക്കോ ഷോപ്പിലും വീടിനടുത്തുള്ള ഇക്കോ ഷോപ്പിലുമാണ് കൊടുക്കുക. ചാണകം, പഞ്ചഗവ്യം, സ്ലറി എന്നിവ മാത്രമേ ഉപയോഗിക്കാറുള്ളൂ. വിഷം തൊടീക്കാറില്ല. അതുകൊണ്ട് സ്വന്തം ആവശ്യത്തിനും ഈ പച്ചക്കറിയാണ് ഉപയോഗിക്കുന്നതെന്ന് സജീവ് പറയുന്നു.

വെള്ളം ഉപയോഗിച്ചു ചെടികളെ പരിപോഷിപ്പിച്ച് ചെയ്യാം മണ്ണില്ലാക്കൃഷി

ഡോ. പി. സുശീല
DECEMBER 23, 2020 03:30 PM IST

HIGHLIGHTS
- എന്താണ് ഹൈഡ്രോപോണിക്സ്?
- മണ്ണിൽ വളരുന്ന ചെടികളെക്കാൾ വേഗത്തിൽ വളരുന്നു

കേരള കാർഷിക സർവകലാശാലയിലെ ഹൈടെക് ഗവേഷണ-പരിശീലന വിഭാഗത്തിൽ ഫ്ലാറ്റിലും ചെറുവില്ലകളിലും വീട്ടിലേക്കാവശ്യമുള്ള പച്ചക്കറികൾ കൃഷിചെയ്യുന്നതിനുള്ള നൂതന സാങ്കേതികവിദ്യകൾ വികസിപ്പിച്ചെടുത്തിട്ടുണ്ട്. ഉയർന്ന ഫ്ലാറ്റുകളിൽ ജീവിക്കുന്നവർക്കു കൃഷി ചെയ്യാൻ മണ്ണോ ചകിരിച്ചോറോ ഉപയോഗപ്പെടുത്താൻ ബുദ്ധിമുട്ടാണ്. അവർക്കു കൃഷി ചെയ്യുന്നതിനു വെള്ളത്തെ മാത്രമേ ആശ്രയിക്കാനാകൂ. ഇതിനായി ഹൈഡ്രോപോണിക്സ് കൃഷിരീതി ഉപയോഗപ്പെടുത്താം.

ജൈവവളങ്ങളും വെള്ളത്തിൽ അലിയുന്ന രാസവളങ്ങളും ഉപയോഗിച്ചു ഹൈഡ്രോപോണിക്സ് കൃഷി ചെയ്യാം. സാധാരണ കൃഷിക്കു വേണ്ടതിന്റെ 5-10% ജലം മാത്രമേ ഈ രീതിക്ക് ആവശ്യമുള്ളൂ. വളലായനി പരിചംക്രമണം ചെയ്യുന്നതുകൊണ്ട് വളവും വെള്ളവും നഷ്ടപ്പെടാതെ പൂർണമായി ഉപയോഗിക്കാനുമാകും.

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കോഴികളിൽ കണ്ടുവരുന്ന രോഗങ്ങളും നിയന്ത്രണമാർഗങ്ങളും...

എന്താണ് ഹൈഡ്രോപോണിക്സ്?

ഹൈഡ്രോപോണിക്സ് എന്നാൽ വർക്കിങ് വാട്ടർ അഥവാ ജോലി ചെയ്യുന്ന വെള്ളം എന്നാണ്. അതായത്, വെള്ളം നമുക്കായി അധ്വാനിച്ചു ചെടികളെ പരിപോഷിപ്പിക്കുന്നു. ഇവിടെ വെള്ളവും വളവും നൽകുന്നതിനുള്ള മാധ്യമം വെള്ളം തന്നെ. ചെടികൾ, മണ്ണിലല്ല, വെള്ളത്തിലാണ് വളരുന്നത്. മണ്ണിൽ കൃഷിചെയ്യുമ്പോഴുള്ള നിലം ഒരുക്കൽ, കള പറിക്കൽ, വെള്ളവും വളവും നൽകൽ, ഇടയിളക്കൽ, കാഠിന്യമുള്ള മറ്റു ജോലികൾ എന്നിവ ഹൈഡ്രോപോണിക്സിൽ ഒഴിവാക്കാം. ഓരോ ചെടിയുടെയും വേരുപടലത്തിൽ വെള്ളവും വളവും എത്തിച്ചുകൊടുക്കുന്നതുകൊണ്ടു ചെടികൾ തമ്മിൽ വെള്ളത്തിനോ വളത്തിനോവേണ്ടി മത്സരം ഉണ്ടാകുന്നില്ല. അതിനാൽ ഒരു യൂണിറ്റ് സ്ഥലത്തിൽ 10 മുതൽ 30 ശതമാനം വരെ കൂടുതൽ ചെടികൾ വളർത്താം.

ഹൈഡ്രോപോണിക്സിൽ വെള്ളം പരിചംക്രമണം ചെയ്യുന്നതിനാൽ മണ്ണിൽ കൃഷിചെയ്യുമ്പോൾ നനയ്ക്കു പതിവ് അളവിന്റെ 5-10 ശതമാനം മാത്രമെ വേണ്ടിവരുന്നുള്ളൂ. കൂടാതെ, വെള്ളത്തിലെ വളവും വളരെ ഫലപ്രദമായി ഉപയോഗപ്പെടുത്താം. മണ്ണിൽ വളരുന്ന ചെടികളെക്കാൾ വേഗത്തിൽ വളരുന്നു. രോഗ,കീടബാധ താരതമ്യേന കുറവായിരിക്കും.

തക്കാളിക്കൊപ്പം ചോളം, വെള്ളരിവിളകൾക്കൊപ്പം മുതിര: ആകർഷിക്കാം മിത്രകീടങ്ങളെ

സംവിധാനം ഒരിക്കൽ സ്ഥാപിച്ചുകഴിഞ്ഞാൽ അധ്വാനം കുറവായതിനാൽ കുട്ടികൾക്കും പ്രായമായവർക്കും ഭിന്നശേഷിക്കാർക്കുമൊക്കെ അനായാസം നോക്കിനടത്താം. തുറസായ സ്ഥലങ്ങളിലും ഗ്രീൻഹൗസുകളിലും ഇതു ചെയ്യാനാകും. വീട്ടാവശ്യത്തിനുള്ള ചെറിയ യൂണിറ്റുകൾ മുതൽ വ്യാവസായികാവശ്യത്തിനുള്ള വലിയ യൂണിറ്റുകൾവരെ തയാറാക്കാനാവും. എന്നാൽ ഹൈഡ്രോപോണിക്സിനു മണ്ണിലെ കൃഷിയെക്കാൾ മുതൽമുടക്കണം. അതീവ ശ്രദ്ധയും ആവശ്യം. ഈ രീതിയിൽ മുളക്, വെണ്ട, തക്കാളി, പയർ, സാലഡ് വെള്ളരി, കാപ്സിക്കം തുടങ്ങിയ പച്ചക്കറികളും ലെറ്റ്യൂസ്, പാലക്, ചീര, ബാസിൽ, ചൈനീസ് കാബേജ് തുടങ്ങിയ ഇലച്ചെടികളും കൃഷിചെയ്യുന്നതാണ് നല്ലതെന്നു കാണുന്നു.

വിലാസം: പ്രഫസർ, ഹൈടെക് റിസർച്ച് ആൻഡ് ട്രെയിനിങ് യൂണിറ്റ്, ഇൻസ്ട്രക്ഷണൽ ഫാം, കേരള കാർഷിക സർവകലാശാല, വെള്ളാനിക്കര.

English summary: Hydroponic Gardening

കർഷകശ്രീ

ഇഞ്ചിക്ക് ആര്യവേപ്പില, വിളവുണ്ടാകാൻ ഗ്രാമ്പുവിന് ഗോമൂത്രം: സുഗന്ധവിളകൾക്ക് വേണം നാട്ടറിവുകൾ

VIDEOS

RELATED STORIES

- ഇഞ്ചിയുടെ മൂടുചീയലിനു [illegible] രോഗം ബാധിച്ച ഇഞ്ചി മുഴുവനോടെ നീക്കം ചെയ്തതിനു ശേഷം ആ കുഴികളും മറ്റുള്ളവയ്ക്കും ചുറ്റിലും ഒരു വരമ്പുപോലെ കറിയുപ്പ് ഇട്ടുകൊടുക്കുക. മണ്ണിൽ നനവുണ്ടാകേണ്ടത് അത്യാവശ്യമാണ്.
- ഇഞ്ചിത്തടങ്ങളിൽ നീർവാർച്ചാസൗകര്യം ചെയ്യണം.
- ഇഞ്ചിത്തടത്തിൽ വാഴയിലയും ആര്യവേപ്പിലയും ചേർത്തു പുതയിട്ടാൽ കിഴങ്ങിനു വണ്ണം ഉണ്ടാകും.
- ഇഞ്ചിക്കു പുതയിടാൻ കാഞ്ഞിരം, നെല്ലി, പുല്ലാനി, കാട്ടുമരുത് എന്നീ മരങ്ങളുടെ ചവറാണ് ഏറ്റവും നല്ലത്.

മഞ്ഞൾ

- മഞ്ഞൾ പുഴുക്കുത്തു തടയാൻ കടലാവണക്കിന്റെ കായ ഇലയോടുകൂടി ഉണക്കി ചാക്കിന്റെ മുകളിലും ഇടയിലും വയ്ക്കുക.
- മഞ്ഞൾ പുഴുങ്ങും മുൻപ് അതിൽ പറ്റിയിരിക്കുന്ന ചെളിയും മണ്ണും നീക്കണം. തടയും വിത്തും വേർതിരിക്കുകയും വേണം. ഇല്ലെങ്കിൽ തട വേവാതിരിക്കുകയും വിത്ത് വെന്തു പോകുകയും ചെയ്യും.
- മഞ്ഞൾ വേണ്ടത്ര വേകണം. കൂടുതൽ വേകുന്നതും തീരെ വേകാതിരിക്കുന്നതും മഞ്ഞളിന്റെ ഗുണം കുറയ്ക്കും. ചോറിന്റെ വേവു നോക്കുന്നതുപോലെ കൈവിരലുകൊണ്ടമർത്തിയാൽ വേവറിയാം. ഈർക്കിലു കൊണ്ടു കുത്തിനോക്കിയാലും മതി.
- ഉണങ്ങിയ മഞ്ഞൾ മിനുക്കിയാൽ കൺമതിപ്പു കൂടും. ഇതിനായി ഉണക്കമഞ്ഞൾ ചാക്കിലെടുത്തു ചെറുതായി തല്ലുകയോ തുണിയോ ചാക്കോ പൊതിഞ്ഞ കാലുകൊണ്ടു ചെറുതായി ചവിട്ടിത്തേക്കുകയോ ചെയ്യാം.
- മഞ്ഞളിനു കാഴ്ചചന്തം നൽകാൻ കുറച്ചു മഞ്ഞൾപ്പൊടി കലക്കിത്തളിക്കുന്നതു നന്ന്. മഞ്ഞൾപ്പൊടി എല്ലായിടത്തും പറ്റിപ്പിടിക്കണം. മഞ്ഞൾ ഒന്നുകൂടി ഉണക്കുകയും വേണം.

ചുക്ക്

- ചുക്ക് കേടുവരാതിരിക്കാൻ കടലാവണക്കിന്റെ ഇലകൾ നന്നായി ഉണക്കിപ്പൊടിച്ചു ചുക്കിൽ ചേർത്തു വയ്ക്കുക.
- ചുക്ക് കേടുവരാതിരിക്കുന്നതിന് ഇഞ്ചിപ്പുല്ല് ഉണക്കി ചുക്കും ഇഞ്ചിപ്പുല്ലും ഇടവിട്ടു നിറയ്ക്കുക.
- ചുക്കിൽ കരിനൊച്ചിയിലയോ വയമ്പോ ചേർത്തു സൂക്ഷിച്ചാൽ കീടങ്ങൾ വരില്ല.

ഏലം

- വേനൽക്കാലത്ത് ഏലത്തോട്ടത്തിൽ തളിനന നടത്തിയാൽ വർഷം മുഴുവൻ വിളവെടുക്കാം.
- ചാരം ചുവട്ടിൽ ഇട്ടാൽ ഏലത്തിന്റെ അഴുകൽ കുറയും.

ജാതിക്ക

- ജാതിയുടെ കറുത്ത കായും പത്രി പൊതിഞ്ഞിരിക്കുന്ന കായും മിക്കവാറും പെൺ തൈ ആയിരിക്കും.
- ജാതിക്ക പാകി അവസാനം മുളയ്ക്കുന്ന തൈകൾ പെണ്ണും ആദ്യം മുളയ്ക്കുന്ന തൈകൾ ആണും ആയിരിക്കും.
- തട്ടുകൾ അടുത്ത തൈകൾ കൂടുതലും പെൺതൈകളായിരിക്കും. തട്ടുകൾ അകലത്തിലുള്ള തൈകൾ കൂടുതലും ആണായിരിക്കും.
- ഇലകൾ നീളം കൂടിയ തൈകൾ മിക്കവാറും ആൺതൈയായിരിക്കും. ജാതിക്ക് അടുത്ത് കുടംപുളി നട്ടുകൊടുത്താൽ പത്രിക്കും കായ്ക്കും വലുപ്പമേറും.

ഗ്രാമ്പൂ

- ഗ്രാമ്പൂച്ചെടിയുടെ ചുവട്ടിൽ ഗോമൂത്രമൊഴിച്ചാൽ കൂടുതൽ വിളവുണ്ടാകും.