Vadamalai Media Group

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Agriculture & Industry Survey

India's Leading Business Magazine for Agriculture

India should matter in today's world, right? How far?

Dr. N C Nainwal, General Secretary, WANGAI
Speaks about the richness of walnut and the scope of walnut cultivation in India.

Hitendra Patel, Director, Lemino Agro India Pvt Ltd
One of the successful CEOs in India who has embarked on a journey to try and increase farmers' income. He thus started cultivation of seedless lemons.

Sopan Kanchan, President, Confederation of Indian Horticulture, Grape Grower Association of India
Speaks to us at length about grape cultivation and its nuances.

Dr. Subramani K K, Agri Scientist
"I run an NGO teaching Sanskrit free of cost to girls across the country. I also get these students educated on papaya breeding. Papaya Breeding is the income source that keeps this NGO afloat."

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CONTENTS

India's standing in the world

India should matter in today's world, right?
How far? India has reversed the democratic path?
Some thoughts for the younger generation!

The world today is not an orderly world. We have just to see how the departing US President, Donald Trump had spoilt the very good and great name of the USA in such disgrace and made himself a laughing stock in the way he treated his August office. What a blot for the democratic legacy we have all learnt to uphold as a beacon of high political ideals the world over. And that gave the world political system a sense of stability and a long-term hope and inspiration. America became a sort of culmination of a great political ideal that can be traced back to very long legacy since the very concept of democracy originated in the 2,500 BC in Athens. Why even in the late 18th century when the French Revolution came about in 1789, we saw the great American leaders who learnt the democratic core values, liberty, equality and fraternity were all incorporated into the American Constitution and that is held as a great measurement of the democratic ideals the world over.

And we Indians come in this quest for democratic political ideals by looking at America and that is where we are today with cultivating the American dream by a nearly unprecedented number of nearly 40 lakh well-educated Indian population settled down as proud citizens. India after its liberation from the hold of the British Empire still looks to the British legacy as its own, we value our old links but progressively we are looking at the Atlantic sea as our new frontier.

Of course lately India's relation with America got many new bonding and also many distortions. Today, after the emergence of the BJP, Indian government sight new alliances and under Trump we thought we had got a new alley that we think would further enhance our standing in the world.

Unfortunately, the latest happenings at the White House storming by Trump's committed followers have suddenly woke us up, in fact we Indians known for easy briefs and lately by much fake news and much else from the Social Media sources. The very leader of America was banned by the Twitter handle!

What an irony and shame!

Today, Santiniketan is drawn into a messy controversy, we don't exactly know who is the author of this controversy and unfortunately Santiniketan's foundation as the source of much of contemporary controversies must be repaired in right earnest by the competent hands. India today is a decertified land as far as a new education and new studies in contemporary world affairs.

Much of the liberal values are getting suffocated and politics itself has become illiberal. The sort of society we see in Delhi, in the power centre seems to be centre of self-seeking individuals' sort of oligarchs, this time they seek only survival goals and no more public spirited politicians. There is a steady deterioration of values. Universities are in decline. Why even independent research and study centres, there are too many to mention here, one such is the Indian Council of World Affairs, established with much expectation is not heard at all these days, and so are others. India is a great democracy and by now we should have head many similar international level research centres.

Even when we studied at Santiniketan there was the world famous Cheena Bhavan with great leaders visiting, one such was the great Chiu-En-Lai with whom the author had the great honour of shaking hands! Martin Luther King came to Santiniketan in my time.

We seem to have become a poor nation suddenly. We have to take up many of the UN institutions ideas and goals. India should become an internationally inspiring centre of world pursuits and diverse studies. Indian Universities must draw more foreign students. So universities must introduce many diverse studies. In short, India should now emerge as the new centre for studying diverse cultures, languages and philosophies.

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Farmers' agitation has to end somehow!

What are the broader requirements and consideration?

The farmers of Punjab, as we write are on a war path. It is an unusual agitation, an agitation very unprecedented in independent India, India had never seen such a massive show of protest that had prolonged for more than 45 days, almost one and half month long. And with such determination on the part of the brave farmers who had withstood again is an unprecedented scenario, hostile weather and so many other discomforts have led to a war of nerves, What is again unusual is the determination of the show of the strength of the State and State power and no one seems to dare to speak out with some honest transparency.

The subject of agriculture is the least interesting subject for a government, it seems. It is so basic an industry and sector and with so much at stake.

India is a self sufficient country in production and distribution of food. Food security is such a high priority and therefore expects that the government would show much concern and anxiety to come out with suitable response. But unfortunately the response of the government seems inadequate.

Again, there is a very peculiar situation prevailing in the country. The world of politics is also seems to be a bit hostile for conciliatory political and social environment. This again is unfortunate.

The media, the TV channels and why even the many other sectors, the corporate world and many other lobbies are also silent for fear of the government? We are not sure. But we seem to feel that even the outside world is not friendly to the very general situation, given the grimness of the Covid-19 pandemic.

The very pandemic threats to the mass of population must have given cause for much concern. We expected the government would take into account the very dangers of this pandemic must have given greater concern for the government, why even the public opinion must have given the government some extra push for worry and moved fast to solve the farmers' miseries. But no the scenario seems to be becoming more and more complex every passing day. But none of these considerations seems to matter.

Now, the subject of agriculture is what matters for us, an agri media outfit. For us for the past quarter of a century agriculture seems to be the top priority. Indian agriculture is a very low priority, it seems in the Indian scheme of things.

India is still a poor country when, say we compare with China for example. China is at least 15 years behind India in many development parameters. The easy majority of the pro people in the world live in India.

INDIA IS ALSO A DEMOCRACY. THAT IS A BRIGHT PATCH.

And as to the current scenario in India is that our agriculture is not doing badly. This again has to be seen in the context of Punjab, Haryana and Western UP seem to be contributing mostly for the surplus production of the two major grains, wheat and paddy.

This year again, there is good news that agriculture is going strong, there is news the kharif crop acreage is more than last year. And other crops, from pulses to sugarcane to cotton are all on the growth curve.

Again we have to turn to Punjab here for the obvious reason that the State still dominates in many other aspects, more midis, more procurement centres, the Khanna Mandi one is vast, some 50 acre spread out and 200 arthiyas who have been playing such crucial roles as small-time bankers for the farmers in times of need and otherwise in many ways.

Punjab farmers are sturdy ice and there is a lot tolerant from them as professional farmers. Yes, they have earned in crores and this is not every Punjabi farmers.

One more reality of rural India, not just in Punjab alone but in every State, there is inequality and why even much inequity in every rural society. Simply because Punjabi farmers on average earn in crores we have to limit their incomes. No! This can't be done and this is not needed.

Land owning is always a problem. Every village would have only one or two big farmers, other could own only a few acres. But rural reality is such that we have to see that the lowest category of farmers also enjoy social security and many other social benefits from any modern government welfare State is the common goal and this is fairly getting realised.

In Punjab agriculture is so advanced. The for every per square kilometre of agricultural farming there are 34 tube-wells. And so the new technologies also have given rise to new challenges.

The Prime Minister's silence is rather intriguing.

All we want to say here is this:

We have to see farmers are the one group that have contributed to the creation of Indian self sufficiency in food production. India is the number one exporter in rice, the most preferred crop in the world, next to wheat. Now traditional food producing countries like Vietnam is importing rice from India! Even Thailand too seem only next India in rice exports.

Also India seems to be back again in growing surplus own sorts in sugarcane production. At the all India level sugarcane production in India is rising.

So too other crops from pulses to other exportable crops. We have to look at the farm issues in a long-term point of view.

Indian farmers have toiled hard, with not great farm subsidies(compared with the US and EU countries farm subsidies). So we would request the government authorities to hold on for some time. From the current three laws that seem to have generated so much bitterness and harshness. Nothing would be lost if we defer the implementation of the laws for some more time.

Let us hope wisdom dawns on every section to reach a peaceful solution of the current tensions and a positive environment. There are other more pressing issues like the deadly Covid 19 that had weakened the nerves of the common man.

Just how much of India's agricultural production is lost to waste due to a lack of appropriate infrastructure?

How much of India's agricultural produce is wasted annually?

This question involves two aspects. The first relates to losses in the food supply chain and the second relates to losses in government warehouses storing wheat and rice. Generally speaking, 'food loss' takes place from the farm up to the retail-level, while the term 'food wastage' is used for loss of food at the retail, food service, and household level.

In many countries, food waste has been studied but there is no authentic study of the same in India. The food items for which the best-to-use date has passed are discarded by supermarkets but the extent of the value of such food items is also not known. The United Kingdom (UK) has taken a lead in the direction of reducing food loss and food waste. Compared to the 2007 baseline, it has reduced the loss and waste by 27%.

Agri-losses

In India, the Central Institute of Post Harvest Engineering and Technology, Ludhiana (CIPHET), an institution of the Indian Council of Agricultural Research (ICAR) has conducted two detailed studies of agri-losses.

The first one was conducted between October 2005 and February 2007 on the recommendation of the parliamentary standing committee of the ministry of agriculture. CIPHET submitted its report to the committee in 2010 and it was finally published in August 2012.

The second study was sponsored by the ministry of food processing industries. It was based on production data of 43 crops and livestock produce in 2012-13 and wholesale prices of 2014. The study was conducted in 120 districts in 14 agro-climatic zones and the report was published in March 2015.

The losses incurred at various stages of production and movement in cereals, pulses, oilseeds, plantation crops, spices, vegetables, fruits, milk, fisheries, poultry and meat were studied. The study of farm-level operations included harvesting, collection, sorting, grading, drying, packaging and transportation. The losses in the storage channel included storage at farm level and godown/cold storage, wholesaler, retailer and processing unit.

Contrary to the popular perception of loss of about one-third of agricultural and horticultural production, the CIPHET study of 2012-13 found that the overall losses were much lower.

In the case of cereals, losses ranged between 4.65% (maize) and 5.99% (sorghum). In the case of wheat and paddy, the losses were 4.93% and 5.53% respectively. Moreover, the losses were higher at the level of farm operations. They were 4.67% in the case of paddy and 4.07% in the case of wheat. The loss in storage was only 0.86% for both wheat and paddy.

As expected, the perishable crops suffered much higher losses. In the case of mango, the total loss was 9.16%. Here also, the loss at farm operations was much higher at 6.92% than the loss in storage at 2.24%. The loss in guava was 15.88% while the same in the case of apple was 10.39%. In the case of vegetables, the loss in the case of potato was 7.32% out of which 6.54% was at the level of farm operations while the loss in the storage channel was only 0.78%. This is due to the large scale storage of potatoes in cold stores. On the other hand, the loss in tomato was 12.44% which was contributed by 9.41% at the level of farm operations and 3.03% in the storage at wholesale, retail and processing levels.

The total loss in the case of inland fish was 5.23%, out of which only 1.05% was in the storage channel. For poultry meat, the total loss was 6.74% but here the major loss was in the storage channel at a high of 4%. Due to the success of operation flood, the total loss in milk was only 0.92%. Of this, only 0.21% was contributed by the storage channel.

The study estimated the total volume of losses for all commodities to be about Rs 92,651 crore. According to Estimates of Value of Output (Central Statistical Organisation, 2016), the value of production of horticulture in 2012-13 was Rs 2,84,000 crore while the estimate of losses was about Rs 31,500 crore. This comes to about 11%. The value of production of livestock in 2012-13 was Rs 5.08 lakh crore while the estimate of losses was Rs 19,000 crore. Thus, the losses were only about 3.7% of the value of production.

Need for raising awareness of farmers

It is clear that the answer to reducing losses in agriculture and horticulture sub-sectors lies not only in setting up cold chains and storage facilities but also in improving the farm-level operations. Reduction of losses during harvesting and threshing as well as sorting and grading of produce is as important as setting up modern storage/cold chain facilities at various levels of marketing after the produce has been sold by the farmers. Education of farmers for better harvesting practices, improved aggregation through FPOs and reduction of the time lag between harvesting and sale of produce can reduce the losses in the supply chain.

The CIPHET study of 2012-13 also found that average losses for food grains, oilseeds, fruits and vegetables had declined by about 2% as compared to the previous study of 2005-07.

Read full @ https://bit.ly/3pByeui

Source : thewire.in

Planters seek changes in Kerala Land Reforms (Amendment) Act

While they welcomed the draft policy, they felt that more curbs need to be removed for full realisation of plantation sector's potential.

The draft plantation policy, approved by the state cabinet last week, allowing inter-cropping and multi-cropping, besides permitting tourism projects in plantation land, will not unlock the full potential of the sector unless the Kerala Land Reforms (Amendment) Act is amended, according to experts.

"Under the existing rules, a planter is prohibited from farming crops like vegetables or fruits in over 15 acres of land. Further, inter-cropping can't be done in a rubber plantation as most vegetables and fruits won't grow under the shade," said Joshy Joseph Manniparambil, a Kanjirappally-based planter, who has plantations in neighbouring states.

The historical Kerala Land Reforms Act enacted by the EMS Namboodiripad government in 1963 and Kerala Land Reforms (Amendment) Act, 1969, imposed a 15-acre ceiling on ownership of agriculture land.

However, it had exempted the plantation sector on the grounds that they were cash crops coming under the Central government's commerce ministry and it involves more capital and high volume of labour. "In Tamil Nadu, there is no restriction of land area for cultivating other crops, except for coconut, where too the limit is 50 acres," Manniparambil said.

According to the Economic Survey, Kerala has a substantial share in the four plantation crops of rubber, tea, coffee and cardamom. These four crops together occupy 7.12 lakh ha, accounting for 27.5 per cent of the total cropped area in the state.

Kerala's share in the national production of rubber was 74.9 per cent, cardamom 89.7 per cent, coffee 21.87 per cent and tea 4.35 per cent in 2019-20.

Rubber occupies the second largest area in the state, next to coconut with 21.3 per cent of the gross cropped area. In Kerala, the area under rubber decreased by 170 ha in 2019- 20.The previous Oommen Chandy-led UDF government had allowed the plantation sector to utilise 5 per cent of the land for non-plantation purposes.

The draft plantation policy approved by the cabinet on Thursday allowed vegetable cultivation, dairy farming, beekeeping and tourism-related projects in the plantations. The new policy also gave its nod to reopen plantations which have been remaining shut for long.

"This is a policy announcement in the right direction. Tourism in plantation has big potential and it remains untapped. For instance, many plantations in Kerala has European-style buildings that can be utilised for tourism projects," said Ajit BK, secretary, Association of Planters of Kerala (APK).

He reckoned the policy announcements are just a first step and more curbs need to be removed for the full realisation of the plantation sector's potential. According to the Economic Survey, the global backlash against globalisation and the subsequent erection of higher tariff barriers led to a decline in the export of plantation-related products of Kerala.

Kerala's Cash crop cultivation

Area under rubber, tea, coffee and cardamom: 7.12 lakh ha or 27.5 per cent of total cropped area

Kerala's share in national production (2019-2020)

- Rubber: 74.9 per cent
- Cardamom: 89.7 per cent
- Coffee: 21.87 per cent
- Tea: 4.35 per cent

Source : www.newindianexpress.com

It is about the subsidy, stupid!

For a country at India's stage of development, subsidy must increase if our agriculture has to become globally competitive.

The standoff between the farmers and the government is continuing during a harsh winter. After many rounds of negotiations, farmers insist that the new farm laws must be withdrawn. The government finds this difficult to concede. Deadlock in the negotiations is worrisome.

Is the stalemate because of grandstanding? Is the real problem being addressed? To my mind, the basic issue, and the elephant in the negotiating room, is the subsidy on account of minimum price support for rice and wheat, which farmers fear will wither away and expose them to market risk. Let me explain.

Farmers know that market price and increase in productivity alone are not sufficient to give them an adequate return. This is why the US gives subsidies to the tune of $62,000 annually per farm establishment. Second, the terms of trade are always against the farmer. He sells everything wholesale, buys everything retail and pays the freight both ways!

Third, governments, while talking of free markets, lean in favour of consumers who can articulate their anger with decibels. Increase in consumer prices, therefore, attracts immediate export and other restrictions that reduce the price realisation for farmers. Fourth, agriculture has certain special characteristics which weaken the negotiating position of farmers. That is the nature of the beast! The harvest comes in during a short period, so the forces of supply and demand work to depress prices. This asymmetry gets magnified if the farmer transacts with buyers who are large and impersonal! In this scenario, she falls back on the minimum support price at which the government buys her produce. The MSP is higher than the market price, and the differential is the subsidy to farmers.

Read full @ https://bit.ly/3rbURWt

Source : www.financialexpress.com

Australian Dairy cultivates relationship with India

THE Australian Dairy sector is taking steps to foster a closer relationship with India, where the demand for dairy milk products is expected to outpace supply for the next decade.

Dairy Australia is building "a long-term engagement plan" with Indian dairy industry counterparts, to help focus Australian dairy businesses on possible areas for co-operation and relationships.

Dairy Australia managing director David Nation said there would be comprehensive research into the Indian dairy market to understand its supply chain, key stakeholders and consumer behaviours.

'That will inform where there are the greatest opportunities for strategic partnerships that benefit both Australian and Indian dairy farmers," Dr Nation said.

"As part of the project, a report on the Indian dairy sector was produced to provide an overview for Australian industry participants to better understand the Indian production systems and market. "It is hoped this initial step wll help focus Australian dairy businesses on possible areas for co-operation and relationships."

India is one of the world's largest dairy producers and the fastest growing large economy, which is projected to be the third largest in the world by 2035 with 1.6 billion citizens. Agriculture Minister David Littleproud said there were "significant opportunities" to expand trade relations with India.

"Consumer demand in India for dairy milk products is expected to outpace supply until 2035 and there will also be enormous demand for value-added milk products," Mr Littleproud said.

"The project is taking a long-term focus and aims to position Australian dairy farmers, processors and supply chains as preferred partners for their Indian counterparts into the future."

The program received a $76,400 grant under the federal government's Agricultural Trade and Market Access Co-operation program.

Source : www.farmweekly.com

Thai long grain rice exports falter amid competitive Indian prices

Thailand is unlikely to remember the international rice market in 2020 favorably, especially for exporters specializing in standard long grain white and parboiled rice.

According to the US Department of Agriculture, Thai 2020 milled rice exports -- excluding Fragrant rice -- totaled 4.2 million mt as of Dec. 27, down 28% year on year. To make matters worse, 2019's year-end total of 5.8 million mt was down 39% from 2018.

Examining 2020 export figures, the situation is even bleaker for standard long grain exporters. White and parboiled rice accounted for 73% of total 2019 exports, according to the Thai Rice Exporters Association (TREA).

From January-November, white and parboiled rice only accounted for 65% of the year's reduced export total.

Instead, an increasingly large percentage of Thai exports comprise specialty varieties which are often destined for high-end markets. As evidence of this, the quality-conscious US market was Thailand's main export market for several months in 2020, replacing more traditional markets in sub-Saharan Africa. The vast majority of Thai rice that was exported to the US was Fragrant rice, according to participants.

According to TREA, Hom Mali Fragrant rice accounted for 20% of total exports in January-November 2020, up from 15% in 2019. Another niche product, Glutinous rice, also accounted for 2.3% of exports in the same period, up by 1.1 percentage points year on year.

Price effect

Price has been the main cause in these shifts and while buyers have limited options if they wish to buy more niche and often branded Fragrant or Glutinous rice varieties, they can go to multiple other markets for white and parboiled rice. Since the start of 2019, Thailand has consistently been either the most expensive or second most expensive major origin of white rice in Asia. Additionally, price spreads between major origins have widened considerably since the second half of 2019, meaning Thailand has often not been a competitive origin for white rice by a large margin.

While the price spread of 5% broken white rice between the four main Asian origins -- Thailand, India, Vietnam and Pakistan -- would typically be assessed by S&P Global Platts at no more than $50/mt, the spread often rose well above $100/mt in 2020.

Participants have cited multiple factors for Thailand's high prices and low export figures in recent years. These range from the government reducing farmer subsidies to the lack of old crop stocks, which often topped up current crop exports by around 1 million-2 million mt each year.

Read full article @ https://bit.ly/2YErxMe

Source : www.spglobal.com

Online Meetings @ www.agricultureinformation.com

Upcoming events

FEBRUARY 5, 2021

11.00 AM
Dr. Purushottam M Dewang on "How to manage the health of plants in vertical farming?"

03.00 PM
Dr. Ritasree Sarma on "Helping agri start ups raise investment"

FEBRUARY 8, 2021

11.00 AM
Mr. Debasish Pattnaik on "What is Biostimulants and how it helps to increase crop productivity"

03.00 PM
Lt. Cdr. CV Prakash (Veteran) on "Mission Turmeric 2021 – Launching the orange revolution AatmaNirbhar Bharat"

FEBRUARY 9, 2021

11.00 AM
Dr. A. Amarender Reddy on "Budget 2021: Agriculture and rural development"

03.00 PM
Dr. C. Madhumathi on "Production technologies in high density guava cultivation"

FEBRUARY 10, 2021

11.00 AM
Mr. Ajit Sarangi on"Soilless rooftop nursery, organic farming right at home!"

03.00 PM
Ms. Shruthi Krishna on "Spices intercropping in arecanut farm-nutmeg, cardamom and pepper"

FEBRUARY 11, 2021

11.00 AM
Mr. Navdeep Verma on "Automation a boon for agriculture"

03.00 PM
Mr. Sameer Akhil Sirdeshpande on "Amla- cultivation, processing and marketing"

FEBRUARY 12, 2021

11.00 AM
Mr. Rajender Kumar on "Big potential for apple cultivation in unconventional locations"

03.00 PM
Mr. Anand Shubham Pandey on "Plant diseases and their management"

FEBRUARY 15, 2021

11.00 AM
Mr. C J Prabhakar on "Business opportunities in wild silk and allied uses of silk and by-products"

03.00 PM
Mr. Ashwin Sawant on "Hydronic fodder in animal husbandry"

FEBRUARY 16, 2021

11.00 AM
Dr. Sushant Shekhar on "Infrastructure and other machinery for button mushroom production"

03.00 PM
Dr. D. Srinivas Reddy on " Orange cultivation- Everything you need to know"

FEBRUARY 17, 2021

11.00 AM
Mr. Surajit on "Climate smart and sustainable agriculture solution"

03.00 PM
Dr. Raj Kumar Yogi on ""What is Lac Cultivation?"

FEBRUARY 18, 2021

03.00 PM
Mr. Jai Agarwal on "Dairy products manufacturing and modern milk procurement systems"

FEBRUARY 19, 2021

11.00 AM
Dr. Chandrashekara C P on "Organic production of sugarcane and value addition to organic jaggery"

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Meetings in Archive

Dr. Devaraja T N on "Technological modifications in fish farming is profitable"

Dr. Devaraja T N is the Senior Scientist and Head at ICAR Taralabalu KVK in Davanagere, Karnataka. His interest is freshwater aquaculture. To know more view https://bit.ly/2LVT48U

Mr. Yashwant Dhakad on "How to do Quinoa farming successfully?"

Mr. Yashwant Dhakad is the Founder of KISAAN HELPLINE in Indore, Madhya Pradesh. His interest is to improve farmers life and empowering sustainable agriculture in India. He is doing quinoa farming successfully. He says quinoa is high protein quality food. To know more view https://bit.ly/3sr61s2

Ms. D. Janani on "Honey farming - Status of Indian honey in global scenario"

Ms. D. Janani is a Research Scholar at Indian Institute of Food Processing Technology, Thanjavur, Tamil Nadu. Her father being an apiculture farmer, the knowledge that Ms Janani has accumulated in Apiculture is quite vast and informative.

Mr. Sudhir Choudhary on "Importance of youth in Agriculture"

Mr. Sudhir Choudhary, Founder, Family Farmer NGO, Jaipur, Rajasthan is the son of a farmer and currently running a non-profit organisation to help farmers. He has seen struggles of farmers and till date made thousands of farmers educated and has created awareness about better farming methods.

Mr. Mahesh R V on "Spirulina - Cultivation and value addition"

Mr. Mahesh R V is the President of Spirulina Foundation in Tumkur. Mr. Mahesh says they are having a rich experience in fighting malnutrition using spirulina, spirulina cultivation and manufacturing spirulina based food products like nutribar , spirulina fortified sugar granules etc. They have several MOUs with CSIR-CFTRI, Mysore and are doing lot of research and R&D in the field of spirulina and malnutrition.

Mr. Prashant Chaturvedi on "Technology provider for the cultivation of aloevera and processing"

Mr. Prashant Chaturvedi is the Director of SUNRISE Agriland Development & Research Pvt. Ltd. in Jaipur, Rajasthan. They are into providing information related to medicinal/horticulture farming and herbal industrial units ; soil/water testing in their research institutes ; prepare project reports and provide technical information of the report ; supply high quality seeds / seedlings and also provide information about raw materials to the industrial units; To know more view https://bit.ly/3nrpOnB https://bit.ly/2Xpigah

Mr. Bala Shiva Prasath on "Dutch rose cultivation, economics and marketing under poly house "

Mr. Bala Shiva Prasath is the Managing Director Shiva Shakthi Floritec in Hosur, Tamilnadu. His interests are dutch rose cultivation under polyhouse and other related to floriculture / polyhouse technology .

Mr. Balkrishna Dhondiba Pansare on "Pomegranate cultivation - Everything you need to know"

Mr. Balkrishna Dhondiba Pansare is the Proprietor of Pansare Nursery in Ahmednagar, Maharashtra. His interest is pomegranate cultivation. To know more view https://bit.ly/3nHrpFP

Mr. Mehul Shah on "Rotary Tiller(Rotavator) - types,usage & its benefits to farmers"

Mr. Mehul Shah is the Vice President Sales & Marketing at Paama Agrico Private Limited in Bengaluru, Karnataka. His interests are upcoming agriculture implements, new ways of agriculture farming, Government initiatives in agriculture segment. To know more view https://bit.ly/2Lagqr2 https://bit.ly/34UD0e8

Mr. Vinay Jaju on "Farmer producer organisation - My experience with 3000 flower cultivating farmers"

Mr. Vinay Jaju is the Managing Director / Co-founder of Environment Conservation Society (SwitchON Foundation) in Kolkata. His areas of focus include: Renewable Energy Access, Agriculture/Livelihoods, Skilling/Education, Wellbeing. As a Co-founder of SwitchON Foundation, ONergy and ONSkills he has led projects in partnership with various Ministries of Govt of India and agencies like US Embassy, GIZ, UNDP, GE, WWF etc. To know more view https://bit.ly/38KWpjV

Ms. Krutika Ravishankar on "Revolutionising India's forestry sector"

Ms. Krutika Ravishankar is the Co-Founder of Farmers for Forests in Pune , Maharashtra. Ms. Krutika has more than a decade of experience in the international development, equity and market research sectors with a special focus on forestry, agriculture and cash transfers. She has previously worked with the World Bank, Urth Agriculture and the Abdul Latif Jameel Poverty Action Lab at Massachusetts Institute of Technology.

Mr. Yetendra Kashyap on "Great market in producing quality fish seeds"

Mr. Yetendra Kashyap is the Director of Kash Fishries, Sangrampur Motihari, Bihar. Kash Fisheries is a family run farm operational for more than six decades. It deals in six fish varieties namely Rohu, Catla, Mrigal, Silver Carp, Grass carp and Common carp. Mr. Yetendra Kashyap third generation fish farmer, says every generation took the business to the next level.

Dr. Praveen Singh on "Hydroponics for urban farming"

Dr. Praveen Singh from Gurugram , Haryana is a hydroponic professional with hands-on experience on soilless, NFT and dutch bucket hydroponic growing system. To know more view https://bit.ly/3mXhvzr

Ms. Jyotsna Kaur Habibullah on "Creating & supporting ecosystems, brand building and marketing support to farmers & agri entrepreneurs"

Ms. Jyotsna Kaur Habibullah is the Founder, CEO of Lucknow Farmers Market in Lucknow. Her interests are connecting farmers & start-up entrepreneurs to customers; brand building & marketing support to farmers & entrepreneurs; helping to create a conscious community for lowering carbon footprint and encouraging Rethink, Reuse, Reduce, Recycle. To know more view https://bit.ly/2KE7HNW

Mr. Sanjay Bhattacharji on "The problems I faced in dairy farming and how I solved them"

Mr. Sanjay Bhattacharji is the Founder & Director of Teplu Learning Pvt. Ltd., in Mumbai, Maharashtra. Mr. Sanjay Bhattacharji has been a dairy farmer in his first stint as an entrepreneur. He has also worked with large corporates in the field of marketing and digital technology. As a dairy farmer, he has faced numerous problems and solved them. He has gained valuable insights in dairy farming and milk processing. To know more view https://bit.ly/3q6R1h9

Mr. Dharmendra N Rai on " Is Vertical farming relevant in India? "

Mr. Dharmendra N Rai is the Country Director(India) of Association for Vertical Farming – Germany in Kolhapur, Maharashtra. His interests are Vertical Farming and Urban Agriculture . To know more view https://bit.ly/3oNaPWv

Dr. Renu Agrawal on "Utilization of agri wastes "

Dr. Renu Agrawal is the Ex. Chief Scientist and Rural Program Coordinator at CSIR-CFTRI (Central Food Technological Research Institute)in Mysuru, India. She is the advisor, outreach activities at CFTRI. She has over 20 patents to her name, with 65+ publications in International and National Journals. To know more view https://bit.ly/3pz6Cpb

Mr. Rajesh Mantena on "Advanced technologies in crop inputs"

Mr. Rajesh Mantena is the CEO & Co-Founder of Leofame Chemicals Pvt Ltd, in Hyderabad. Mr. Rajesh Mantena says they are in continuous quest to identify and provide advanced technologies in crop inputs. In this regard, they are successful in manufacturing an Organic Plant Growth Promoter (Amrutha-Jalam) which is Amino Acid based PGR.

Mr. Rajender Kumar on "Strawberry - Profitable crop for Indian Market"

Mr. Rajender Kumar, Business Development Manager-South & East Asia, Cravo Equipment Ltd., Canada. The retractable roof production system or RRPS has been developed by Cravo over the last 35 years, to help growers create superior results using a system that combines the benefits of climate optimization, nature and protection. To know more view https://bit.ly/3kJeymi

Mr. Kuruvilla Joseph on " Exotic fruits in coffee plantation - My experience"

Mr. Kuruvilla Joseph is a Planter at Rose Garden in Meppadi , Kerala. He is into coffee plantation for past 40 years and started intercropping of exotics fruits 30 years ago. Mr. Kuruvilla Joseph has got lychee Ratna Award for best winter lychees. Currently he is growing mangosteen, rambutan, lychee , pulasan , avocados, dragon fruit , multiple banana varieties and spices. He is also doing direct marketing without mediators.

Mr. C J Prabhakar on "Business opportunities in Sericulture - From cultivation to reeling"

Mr. C J Prabhakar, Retd Scientist, Central Silk Board, Bangalore has, over the years, served as Research Assistant, Research Officer, Deputy Director and as Scientist-D in Research Institutes, Silkworm Seed Laboratory, National Silkworm Seed Organisation and Muga & Eri Silkworm Seed Organisation. He has published over 25 research papers as author and co-author in science journals, conferences and periodicals. Mr. Prabhakar has also presented 2 papers at the 2010 International Wild Silk Moth Conference, Tokyo.

Mr. Jay Prakash Lal Das on " How to double the income in fish farming with makhana aqua crop? "

Mr. Jay Prakash Lal Das is the Founder and Aquaculture Consultant at Fishery Clinic in Darbhanga, Bihar. Fishery Clinic is the consultancy firm established in the year 2009. Mr. Jay Prakash Lal Das says he has trained more than one thousand farmers in makhana cum fish farming . In the lowland farming regions having good water retention capacity this integration will lead to good returns to the farmers.

Mr. Amit Khurana on "The debate over adulteration of honey – recent controversies"

Mr. Amit Khurana is the Director, Food Safety and Toxins Programme at Centre for Science and Environment in Delhi. His interest is food safety. To know more view https://bit.ly/2KGqoA0

Ms. Sophie Colvine and Ms. Shruti Sasidharan on "Will India emerge in the next few years as a significant player in the tomato processing Industry?"

Ms. Sophie Colvine is the General Secretary at World Processing Tomato Council (WPTC) in Avignon, France. Her interest is tomato processing industry. To know more view https://bit.ly/2WnVxuB

Mr. Abhilash Gorhe on "India Good Agricultural Practices (IndGAP)"

Mr. Abhilash Gorhe, is the Technical Expert in Quality Council of India (QCI) ; Secretary, Avocado India; Chief Consultant, Samrudhhi Exchange, Nasik, Maharashtra is into training, audits, compliance, certifications, cultivation of fruits and vegetables with good agri practices , organic farming and food. To know more view https://bit.ly/3ocE58V

Dr. D. Pari Naidu on " Integrated crop model to increase farm income "

Dr. D. Pari Naidu, Managing Director, Jattu Trust, Parvathipuram, Andhra Pradesh. His interests are food security and natural farming. To know more view https://bit.ly/3o9qq29

Online meetings are available only for Premium Members

Talking to

Dr. N C Nainwal

General Secretary
Walnut and Nut Fruit Growers Association of India

Walnut and Nut Fruit Growers Association of India, WANGAI, as the name suggests, deals with walnut cultivation in India. This is one of the major source of income, nutrition and livelihood for the Himalayan farmers.
Dr. N C Nainwal, General Secretary, WANGAI speaks about the richness of walnut and the scope of walnut cultivation in India.

Are there different types of walnuts?
There are two kinds of walnuts - English walnuts and black walnuts. English walnuts hail from Europe and Persia which is edible. The black walnuts on the other hand is not edible. In California, USA they have developed a hybrid which is edible and of high quality.

Tell us about the Indian walnut industry.
Walnut, in India, can be grown only in the Himalayan states. It needs an altitude of 1200 to 2000 meters above sea level and deep, fertile, well drained sandy-loamy soil (6.5 to 6.8pH Value). The crop cannot withstand a temperature of above 40 degree centigrade. It also requires 700-1500 hour chilling at about 7 degree Celsius temperature. The production statistics that we have for instance, dates back to 1990 till date. There has been no production increase for walnut since then. The scientists released some walnut varieties in India. But they are unable to compete with the international qualities we have in the market today.
Around 2-3 L people are directly or indirectly involved with the walnut industry in India. Coming to the economic value of walnut, it is a very important nut. We export it to about 42 countries from India which generates about Rs. 300 crores as revenue.

What are the benefits of walnuts?
Walnuts are a symbol of intellectuality. The kernel resembles the shape of our brain and is a major source of Omega 3 fatty acids. It is a great boost for the heart, bone density, prevents inflammatory diseases and has anti-cancerous properties as well.
With the growing knowledge about walnuts, the consumption is on the high in the last 20 years. In India, we consume around 80,000 tons of walnuts in a year out of which 35000 tons is imported. Having said that, the Government of India has stopped the import of walnuts from the US starting this year. Hence, there is great scope and the Government is also looking forward to increase in walnut production within India.
Although walnuts are cultivated in 5 Himalayan states, 90% production happens in Jammu and Kashmir. But the state has its own set of challenges. The rest of the states hardly produce 10%.

How about the international market?
Globally China is the biggest producer of walnuts, followed by USA, Turkey, Iran, Mexico etc.

What is the scope of walnut farming

in India?

To understand the scope, one must understand the constraints as well.

1. Non-availability of vegetative propagated planting material. There are hardly any nurseries, organizations, institutes etc. which can supply high-yielding grafted walnut plants. The Indian government, in 2015, has permitted importing of planting material.
2. The orchards which we have in India today are seedling orchards which have large tree size. These start fruiting from 10-12 year onwards; where as grafted trees will begin fruiting from 3-4 years of planting itself.
3. Lack of suitable root stalk
4. Inadequate knowledge of cultural practice, processing and marketing. This requires strong partnership with the private sector.
5. Lack of standardization of nurseries.

We have the capacity to expend 15000 hectare area in Uttarakhand, Himachal Pradesh and Arunachal Pradesh in the coming 10 years. To do this we need

50L plants. In a meeting I had with the Agricultural Ministry in the month of January, I was assured that anybody interested in nursery establishment will be supported immensely by the Government of India. I highly recommend these nurseries to be taken up by the private sector. The requisite production technologies can be catered to by the State Universities, ICAR Institutes etc.

We have recommended that we need a Walnut Board under the Government of India. We also recommended for a Centre of Excellence for Walnut cultivation in the three Himalayan states i.e. Himachal Pradesh, Uttarakhand and Arunachal Pradesh. This is a crop of which every part of the plant can be used from root to fruit.

Are there any specific requirements when it comes to pollination?

No specific requirements. Wind or bee pollination is sufficient. We recommend planting 5% of the pollinizer plant.

Similar to apples, is there research being done to develop walnut varieties that can be grown in different landscapes?

Apples has been under the microscope since so many years. As a result, scientists have come up with low chilling varieties which can be grown in subtropical areas as well.

But this is not true for walnuts yet.

In the US, in places like California it grows even though they are plain and not mountainous areas. This is because despite being plain lands, they have temperate climate. Walnuts need to be researched on intensively for such varieties to come into existence.

What is the time period from flowering to fruit development/Maturity for walnuts?

It takes about 60 - 70 days.

What is the shelf life of walnuts?

Below 10 degree C, at about 65% humidity walnuts can be stored for 10-12 months. At room temperature, it only has a shelf life of 3 months.

What is the height of a matured walnut tree?

The high-yielding grafted varieties can be maintained at 12-15 meter height. Traditionally they are trees that grow up to a height of 30mt or more.

Do you see China's disadvantage in the international market today as an opportunity for India?

Yes. In fact we already export walnuts from India and we are working towards improving the quality of Indian walnuts and can certainly put our best foot forward.

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Talking to

Prof. S Ayyappan

Chairman

Karnataka Science & Technology Academy, Bengaluru

The KSTA, an autonomous organisation under the Department of Science and Technology, was established in July, 2005. Prof. Ayyappan, former Director-General, Indian Council of Agricultural Research (ICAR) and Secretary to Government, Department of Agricultural Research and Education (DARE) and Chancellor of Central Agricultural University, Manipur, is now the Chairman of KSTA.

Agriculture, an important sector of our economy, is a way of life. The Indian subcontinent, with about 2.5% of the global land and just about 4% of water. We sustain about 17% of global human population and 15% of animal livestock population and the contribution of agriculture to the Indian GDP is around 16%'.

How do you think the current pandemic situation has affected agriculture?

While other areas were affected, the two sectors that continued performing during the pandemic were health and farming. That brings in great resilience to the economy of any country. Hence, that is where we need to focus, invest, integrate and innovate. Food production system comprising both terrestrical and aquatic habitats, contribute immensely in terms of foodgrains, fruits & vegetables, milk, meat, fish egg and so on to the country's food basket. The migration from cities to villages seen for sometime brought new workforce to agriculture, as well as new ways of doing things, as for example, farm to doorstep delivery of several perishables.

What are the main challenges in the agricultural sector?

Challenges such as climate change, natural resource degradation, predominance of small farm holdings, biotic and abiotic stresses, harvest and post harvest losses need to be addressed. The dimension of small holders contributing over 60% to the food basket, with an advantage of family farming, would need attention. In rural areas, labour costs are high and during the pandemic, several people were returning to villages, who need to be suitably skilled for farm operations.

Harvest and post harvest losses are high in farm produce. With several factors such as temperature, humidity, handling, transport limitations, logistics, etc. affecting the farm commodities, loss rates are estimated to be at 6-18%. Every year,agri produce worth nearly on lakh crore rupees are lost, thereby requiring suitable handling and storage facilities.

How can we progress going forward?

We are on the look out for new agriculture, with an emphasis from low-value crops to high value crops and from stress agriculture to precision farming. The advantages of varied agro-climatic zones, 127 in the country and ten in the State of Karnataka, with natural endowments of biodiversity could be harnessed, with scientific crop planning. Also, we can have secondary agriculture in greater measures, moving from farming to agri business and agripreneurship. Integrated farming, combining different crop and animal systems, as suitable to different agro-ecological zones, would be both sustainable and remunerative. Several models are available, enabling doubling income of the farmers. Value addition is another important component for realiging greater value for farm produce. In terms of innovative mechanisms in the farm-to-fork Farmer Producer Organisations and Agri-start ups have proved beneficial, in different commodities and regions.

By 2050, we need to produce 50% more food, to feed the population, also keeping nutritional security and gender equity in focuss. Hence, clustering of farms, integrated farming, farm diversitication, primary processing, food safety and quality assurance and market access need emphasis.

How can we come up with a model that shows increase in the per acre income for farmers?

With the above measures, along with enhancing input efficiencies, reducing production costs, adding value, the supply chains can be made more efficient.

Are there institutes for getting training on organised farming for new comers?

There are several Central Institutions as well as State Agricultural Univeristies, for both forml education and informal ways of capacity building. Depending on the commodity of interest and the location, necessart training coud be availaed from the network of Krishi Vigyan Kendras across the country.

What would you advice newcomers from another industry wanting to try out farming?

There are several innovative entrepreneurs taking to farming with success. The start up movement in farming is increasing, where a blend of traditional farming knowledge and entrepreneurial skills is leading to new ways of agriculture. The newcomers need to learn the basics of farming, of any commodity that they choose, understand the processes, study the markets as well as assess the risks and prepare accordingly, in a wholesome manner.

What are the prospects for the food processing industry?

The food processing industry is one of the fastest growing areas, with diverse farm produce as well as market demands in the country. This requires an amount of training in production and processing, available in several institutions in the country.

The ongoing pandemic shows a hit on exports. What are your thoughts?

Please appreciate that India is one of the largest exporter of agri-produce, as well as a huge domestic market. It is diverse, with a wide range of clientele, for varied food produce. As mentioned earlier, farming sector performed well even during the pandemic, providing food and nutrition to the people of the country, as well as exporting.

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Hitendra Patel

Director
Lemino Agro India Pvt Ltd

Mr. Hitendra Patel have been one of the successful CEOs in India who has embarked on a journey to try and increase farmers' income. He thus started cultivation of seedless lemons.

"I started seedless lemon cultivation from 2013 after research and development. From 2015, I started commercial farming all over India. My plants get sent across to all Indian states. My main intention behind this initiative was to get a value addition from the crops and how to increase the income of the farmers."

How did you land on this concept of seedless lemon?

Seedless lemon is a Taiwan variety. I had visited several farms in Israel in 2012 and observed their emphasis on value addition. Thereafter, I visited China, Vietnam, Thailand and several other countries to learn the farming practices in these countries. This gave me an idea to develop some concept that will provide value addition and benefit the farmers.

What were some of the challenges you faced?

My first challenge to decide which fruit to produce that will give a good yield with less headache to the farmers. Mangoes, pomegranates, guavas etc. require a lot of effort. The income weighed against efforts is less as well as there are diseases and problem of pests that play in during the course of the crop.

Lemon is one such fruit that requires less maintenance and care and doesn't get spoilt easily.

The next hurdle was marketing. This variety is slightly bigger in size. Kagzi lemon is most popular in India and easily marketable. The bitterness and sourness of Kagzi lemon is higher. The seedless variety, on the other hand, is less bitter and the fruit size is of export quality.

We began grading and sorting these fruits. This way the ones that are not of marketable quality could be used for other processes. Our company has a 150-acre farm. We also do farming on leased land.

We give farmers 2 options:

1. Sell the high quality yield in the market and
2. Hand over to us the lesser quality produce to us which we use for value-added production

As an end result, it is beneficial to the farmers. After sorting and grading, we selling the export quality lemon locally in Ahmedabad, Gandhinagar on a door to door basis.

Initially, farmers have tried selling it directly to the market and we have approached businesses as well. The awareness about seedless lemons being less, this approach was not quite successful. Then, we started going from door to door and started distributing these lemons and also creating awareness among the public about the benefits and other features. This created an increase in demand among the people.

We would want to focus on areas like Mumbai, Bengaluru, Hyderabad which

has not been possible now due to the pandemic situation. We have already set up a team in Kolkata which is functional.

What kind of value added products do you come up with?

In terms of value addition, we have started a lemon juice brand called Lemino. Owing to its subtle bitterness, we could come up with not the concentrate variety but the juice version itself. We have already started selling this juice in 3 different flavors in the market for the past 1 year and it is growing popular gradually.

We have also started pickles, chutney and jams. This value addition will bring in an increase in farming which in turn will result in catering to the export demand.

Already, there is lemon export to the Gulf markets. They are also importing from Taiwan and Vietnam, but Vietnam variety is a bit expensive, so there is more opportunity for India to export lemons to the Gulf. We have already sold the high grade variety to a client in Maharashtra and he has started exporting to Sri Lanka. The lesser quality grade is being used by us for processing.

As for the next phase we want to focus on lemon powder, then lemon concentrate. Coca-Cola's Vice President, Mr.Sunil Gulati had visited my farm about 3 years back because they liked the sample that we had provided them. He mentioned that there is a good market for lemon concentrate for which they are currently importing raw material from Argentina.

We would also like to develop products like lemon spread, lemon concentrate, lemon peel powder which is used in cosmetics, lemon fiber powder which is used in ice creams. This will take 2 to 3 years to develop.

For this we will require a daily supply of 200 tons of lemon. We are also planning to venture into contract farming.

What is the suitable soil type for planting lemon?

Lemon can be planted on any kind of soil type. There is a requirement of 1 to 1.5 ft soil depth for the plant to grow strongly. The recommended spacing is about 450 plants in a 12x8 ft area. You can expect an yield within a year of plantation.

How many times is lemon harvested in a year?

It can be harvested all year round. In summer, there is more production due to which I got Rs. 80/ kg in the month of April-May as against Rs. 50/kg which is my average price for 6 months.

This variety also grows on sandy soil as well. We also have some farms with sandy soil like Rajasthan. The temperatue in Gujrat goes up to 48 degrees in the months of April and May. This doesn't harm the the plant but harsh sunlight on the fruit can be damaging. So, we do pruning and cutting in the shape of an umbrella to protect the fruit and it will be inside and will not get damaged.

Can we grow lemons in high-rainfall areas?

If there is flow of water and no storage of water, then there is problem to grow lemons. There is very less water required as what we are using is raised bed farming which has a height of 4ftx1.5ft off soil and on top of that we use agro waste mulching and as a result natural cache is developed in the bed which in turn results in minimum use of water. Lemon requires moisture and not water.

In one acre, how many plants can be planted?

You can have about 450 plants in on acre. First year, production per plant is 10 to 15 kgs. Once plant matures after 2 to 3 years, production is minimum 60 to 70 kgs per plant per year. The life of the plant is 20-25 years.

Do you have branches at Tamil Nadu?

No, we don't have any branches. We have office only in Gujarat. But, we do supply plants by train, courier or travels.

Would you provide the technology transfer to set up aprocessing of lemon for value added products?

Yes, we can supply all over India there is no problem for setting up processing unit. The initial cost would come up to 5 crore for starting a small unit with a monthly production capacity of 20 lakh bottled juice and/or 100 tons pickles.

Right now, we have only pickles and juices. Once the raw materials become easily available, my company will start to produce powder form, concentrate and variety of other products.

Are you growing organically or do you use chemical fertilisers?

In our nursery, we grow organically through gomuthra, waste buttermilk, waste decomposer. This process after spraying and drenching in my nursery.

We have a 100 acre plantation farm for past 4 to 5 years and we follow 100% organic farming. Having said that, my farm is not APEDA certified, but 90% to 100% organic plants are used for manufacturing and production.

Do you have an operational chain in Mumbai?

We have planned software and application for Mumbai already, but it can start only, once the pandemic condition comes under control. Since in Mumbai, there is a lot of problem in this regard, we will not be able to execute it at this time as we cannot travel.

As of now, we have covered only half of Ahmedabad. My next plan is to launch our juices in the corporate offices, showrooms etc.

How do you transport plants ensuring no transportational damage?

We can pack it in corrugated boxes of 40 plants each and send it by train. Our boxes go all over India by train itself. Once the train service commence, we can start the supply from here to other States. Currently, trains ply to Delhi and Mumbai and so we are sending to these places.

The buyer will need to receive it at the station. Our team will contact you and give you the details regarding the train timings etc. so that you can be ready at the station to pick it up.

Are you dealing with only lemon or other citrus fruits as well?

Currently, it is just lemon. We have a client in Kolkata (Kejriwala Group). He has a tea plantation and he has done 100 acre farming on a large scale in Nagpur.

His next venture is 300 acre of lemon farming. Our studies have shown that per day there are 250 truck load demand for lemon in Kolkata. Lemon market is a big market in India.

We have a friend in Goa who has done lemon farming in 2 acres in Goa. At the moment, he is selling at Rs 95 per kg and selling it to the hotels there and is not able to meet the demand at times.

So, the future for seedless lemon is very promising but the challenge is to be able to create the awareness among the public which needs time. We have also supplied to Bijapur, Karnataka. Initially, they were facing a problem in the market, but now gradually, there is a growing awareness among the people. So now there is no problem in selling it in the market.

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Horticulture College and Research Institute, Periyakulam is one of the premier institute in Horticultural Research constitutant college the Tamil Nadu Agricultural University. Initially a Mango Research Station since 1960, upgradeted as Horticultural Research Station and elevated as Horticulture College and Research Institute in the year1990. Sapota "Chikku" PKM 1 to 5, Mango PKM1, Mango PKM2, Acid lime PKM1, Moringa PKM1 and many other fruit and vegetable varieties were released from this institute. Today, we promote high density / ultra high-density planting," says the Dean, Dr. ArumugamThagaiah.

Dr. Arumugam Thangaiah

Dean, Horticulture College and Research Institute
Periyakulam, Tamil Nadu

What is the speciality of high density / ultra high density planting (HDP / UHDP)?

India is one of the richest producers of fruits and vegetables in the world. Almost all Indian states grow fruits. India is the largest producers of mango, bananas, apple and guava in the world. Yet, productivity per unit area is not high enough. One of the biggest challenges we face today is to increase the productivity by adopting high technology.

As per current statistics, the production of fruits and vegetables is around 282 million metric tons and total horticulture produce is about 312 million metric tons. Forecast says that in another 25-30 years, we will need to produce about 450-500 million metric tons without:

1. Expanding the area of production
2. Additional water resources
3. At the possibility of losing human labor in the agricultural field.

Hence, there in a need for smarter ways to maximize the horticultural production and productivity.

High Density and Ultra High Density Planting is one such technology. This is a methodology successful among temperate fruits particularly apple developed in Europe. The technique is to bring in a balance between the vegetative and the reproductive load without deteriorating the plant growth. We are fiddling with the plant scientifically in order to maximize the vegetative growth to optimize the fruit yield.

In India, we have been successful in launching this technique for banana, mango, pineapple, citrus, apple and guava. We have developed and executed a couple of techniques.

The basic principle of High Density Planting is to harness maximum possible returns per unit of inputs and resources.

What are the advantages of this kind of production?

It has advantages and constraints.

Advantages

1. Induced precocity in bearing
2. Enhanced fruit yield and quality
3. Low cost per unit production
4. Easy method of intercropping and harvesting
5. Mechanised fruit production

Constraints

1. Requirement of trained man power for field operations and trained technicians to impart training to farm workers.
2. Higher investment requirements.
3. Lack of promising dwarfing rootstock for crops like mango, sapota etc.,
4. Due to less spacing between plants, any infection spreads quicker.

In the conventional planting system of mango, around 100 plants can be accomadated per hectare, which will give an approximate yield of 7.5 t/ha after the 4th or 5th year of planting the trees. There is a system called double hedge row system in which mango plants are placed at a spacing 10 m x 5 m x 5m. This system accomadate 222 plants that gives an approximate yield of 16 t/ha after 4th or 5th year.

In HDP, a distance of 5m x 5m, accommodate 400 plants per hectare giving an yield of 25 t/ha after 4 or 5 years. In UHDP, one can accommodate 1666 plants per hectare and expect an yield of 37 t/ha.

Hence, the yield can be increased by 5 folds from the same unit space. UHDP enhance the efficient use of applied and natural resource. The constraints are quite manageable.

What brought UHDP in India?

The factors that got UHDP to India are:

1. Declining land-human ratio
2. Depletion of cultivable land by soil pollution, lack of rainfall etc.,
3. Rise in land cost
4. To align with the national moto of doubling the yield and tripling farmer income

Today HDP is done mainly in mango, guava, cashew and banana.

For effective application of HDP, we need a plant architecture - minimize structural branches and maximize fruiting branches.

Ensure minimum shade on the branches so that all branches receive max sunlight. Which increases the photosynthetic the efficiency of the plant. Adopt correct spacing and appropriate rootstock. Use only soft wood grafted plants.

What are the optimum conditions for mango?

The suitable soil types are red sandy loam, alluvial and lateritic soil, 30-44 degree 0C, Soil pH: 6.5-7.5. The best time to plant is July to December. Pits of 1m x 1m x 1m should be dug. The pits should be filled with top soil mixed with 20kg compost, neem cakes, etc., Sterilize the pit, add some nematicides and fertilizers. Follow this with irrigation and then proceed towards planting the mango trees. Plants should be spaced at a distance of 5m x 5m for HDP and 3m x 2m for UHDP. Nowadays 4m x 2m is recommended the ease of movement of tractors through the field, for weeding and other field operations.

Wouldn't this methodology lead to increase in usage of inputs as well?

This is a precision farming, so we should have a ration approach with respect to basic resources. For example, we give 1 lit of water per plant/day in the 1st year. In the 2nd year it should be 3-3.5 liters per plant/day. This will followed in the 3rd year with 6.5-7.5 liter per plant/day, etc., This way for a fully grown tree, 20 litres per day is applied unlike in the conventional method where there is limitless supply of water. Similarly for nutrient and all other inputs are given in a rationed manner as per prescription. There is a schedule for everything.

Since the field is not haphazard and it is planted in a certain order, machines can be operated with ease which minimizes labor on the field. Labor is expensive and scarcely available. So, this becomes a huge advantage.

Another advantage is we prune plants, after a year of growth, cut the top end of the plant at about 70 cm from the base. This signals the plant to produce 2-3 branches below the pruned area. This way we have more control over the tree. Similarly every second branch is topped after 30-40 cm length. That way you get tertiary branches. This way the tree will remain short and yet strong. This method produce more number of flowers, hence the number of fruits is also high. Since plants are being continuously pruned for more fruit production, the plants require more nutrition.

Does HDF/UHDF guarantee an yield that justifies the extra cost?

The initial cost is high when you adopt either of these methods. If our invest meet 1L per hectare in the conventional method, HDP need 1.5L per hectare to adopt this methodology. But the yield is higher than the conventional method.

Can this technique be applied for different crops like coconut or oil palm cultivation?

They are monocotelydon plants, there trees do not branch out, like in the case of Mango / Guava. These cannot be pruned. So, these plants are not suitable for HDP/UHDP.

What is the life reduction in case of HDP/ UHDPcompared to the normal space planting?

Normally the economic production of mango in the normal system is around 60 years. In HDP/UHDP because of continuous training and pruning, one can expect high yield up to 25 years. After that the tree should be replanted. So, to be pragmatic, the growth can be phased for alternate rows and columns so that a sustainable model can be achieved.

Which is the most important phase of the plant life?

The pruning is very crucial and important followed by the water management. Water should be withheld after September. This stresses the plant to convert into the reproductive phase. But this is not true for all fruits. For example, it is not required much for guava because it is a free-flowering plant.

Are there trainings offered to get hands on with this technology?

Yes, we do have trainings. We have HDP mango orchard plantation which you can visit and scientist will explain how things are done. You just need to spend a few hours at the orchard to get trained.

Is this method pragmatic with organic farming methodologies?

It is possible with organic methodologies as well. In fact it is possible with natural farming also but yield will be less.

What would it take to convert an old traditional orchard into a HDP/UHDP orchard?

Conversion is possible but we need to see the orchard first before I can comment. We need to see the size of the tree, etc., Depending on that we can go for severe pruning of existing trees and according to the space available, we can go for HDP instead of UHDP. Just get an expert to visit the place and seek advise.

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Sopan Kanchan

President, Confederation of Indian Horticulture
Grape Grower Association of India

Mr.Sopan Kanchan has to his credit experience in grape cultivation dating back to 1991.
In India grapes are grown in around million acres. 80% of this is grown in Maharashtra, followed by Karnataka, Andhra, Meghalaya and some parts of Tamil Nadu, Gujarat and Haryana.
Today, he speaks to us at length about grape cultivation and its nuances.

What are the different varieties of grapes?

The family of grapes is Vitis vinifera and Vitis labrusca. The edible grapes is called table grapes. Table grapes can either be seedless and seeded. In both varieties you have colored varieties. The most popular variety in India is Thompson seedless which has 1500 clones. There is high market demand for seedless grapes. Green grapes are called white in Maharashtra. The Thompson seedless variety has elongated berries too. The size of the elongated berry is not more than 12-13mm. Thompson seedless is much in demand in the European Union.

Off late farmers have started coming up with mutations. In clones we have a problem as the characteristic of the variety does not exist after 5-6 years. Growing these varieties is a difficult task because the geological selection, soil selection, and cultural practices need to be taken care of at great precision.

How is the market condition for grapes?

We have 2-3 market segments – the European segment, the East European segment, South East Asia etc. Since the last 10 years this market has grown significantly. The year before last we have exported about 27,000 crore grapes. Earlier we never used to export even a single berry to Europe. Curently, the US technology has given a different steer to this industry.

Planning is of utmost importance in the industry. We need to understand the ripening period of each variety. The variety should be selected depending on the market one is looking at capturing & location of your field. Farmers do their best and select whatever is possible.

Is there any particular variety recommended for raisins?

Only the elongated Thompson variety and a few clone varieties are good for raisins. The raisin production has risen up to 12 lac tones. In the 70s we did not have even 5 tons of raisins -The industry has grown dramatically.

Many foreign scientists and experts are visiting India to guide our farmers. The Maharashtra Grape Growers' Association is also doing a good job in guiding the farmers, catering to their basic needs trying to resolve the issues faced by the grape industry.

What are the issues the grape industry is facing?

The grape varieties we grow today are not disease resistant. The bunches are not very long, elongation is not there and the bunches are very compact. In order to get the required size, we need to administer hormones. Usage of hormones upto few parts per million is allowed, but it thickens the skin of the grapes which is not favourable in the European markets.

The berry should be crunchy, should have mouthfulness with good aroma. In each 500gm box they want 50 white grapes and 50 coloured grapes. But we don't have that many really good coloured varieties here in India. We are now importing.

Growers are working on these issues and it will take some time to get estab-

lished. Though our scientists are trying for new varieties, none of them got really popular in the European market. So we need to bring in those varieties that are popular.

What about post harvest management?

Post harvest management is a very important aspect. When and how you harvest defines the grape quality. Our temperatures are usually high while we harvest grapes and so we will have to precool them for export market.

In order to stop their metabolism, we will need advanced precooling stores. It will need 95%+ humidity and +2/+1 deg Celsius. The earlier you precool the harvest, the higher the shelf life.

Also, all food safety norms should be adhered to. Grape growing association and other associations like NRCG do guide farmers and teach them to observe all these norms.

30% of the total grape production is diverted to making grape juice or raisin making and also for wine making.

What kind of investment is needed to venture into the grape industry?

In general, the Indian grape industry is going well. But it requires lot of hard work and is also quite pricey.

In terms of investment, it requires at least 6 lac rupees per acre. The National Horticulture board and other state government organizations are of great help. They offer subsidies as well.

There is a requirement for modern machinery in this industry. We import all the electrostatic pumps and high power tractors. Maharashtra is doing a good job in that. In general grapes is a challenging crop – not an easy one. It requires timely operations.

Any specific reason why Nasik has been the main place for grape cultivation?

Grapes was actually not our native crop. We have worked hard and developed our own practises to bring it to the stage it is today. The climatic conditions in Nasik is very favourable for growing grapes. In Nagpur also it is going quite well.

What is the gestation period for grapes from planting to fruiting?

It takes 23 months.

When does grapes grow best?

In India we harvest grapes almost 6 months a year. It usually starts late November, for the East European market. Feb-March is the peak period.

Grapes grown in Solapur and Maharashtra is very sweet – any particular reason?

It depend on factors like the variety that is chosen. We get good sunlight at the ripening time and good formation of the sugar in the berry. The climatic conditions and soil is also good. Farmers there are well trained to nourish the crop properly with micro nutrients etc. These could be the reasons for the sweetness.

Would your association help farmers / entrepreneurs in procuring grapes?

Of course. We will help with everything. Things are pretty well organized. The only two needs are a good buyer who has good money.

The organization which I started is called Mahagrapes. Initially we imported all the precooling and cold storage machinery from US and we were the first to begin grapes export. Nowadays so many companies export grapes. It is all well streamlined now.

In India don't we also produce Sultana which is similar to the Turkish Sultana?

We don't produce them in Maharashtra. Sultana is a variety of Thompson. It is a short duration crop – you can harvest it in 110 days and it mostly grows in Northern India. It is widely grown in Afghanistan and Australia.

These grapes are predominantly grown for raisin making. In Afghanistan and other places with temperate climate they prune only once, unlike in India where we have to prune twice. So this variey grows well in such places.

Do we have any other good variety that could be used in processing industries like how Sultan is used with breads etc.?

The ones used in bread is called bakery raisins. Iran and Turkey is the most popular for this. Australia is the biggest importer of these kind of grapes.

This variety is definitely doable but they are very low-priced raisins. Our basic cost crosses more than Rs 80-100 a kilo for processing. It is available at a much cheaper rate in Iran etc. Hence, it doesn't make commercial sense to cultivate this variety.

Is there anything you would like to share before we conclude?

There is widespread news that grapes is not good for consumption as it is heavily sprayed with chemicals. But, this is not true any more because a lot of caution is obtained around food safety norms.

I do not claim that it is organic but it is definitely chemical free. Please keep in mind that grapes are quite healthy to eat and just as a precaution when you buy grapes from street vendors or local stores, wash it properly.

We do not use any hazardous pesticide, they are all banned. Due to climatic conditions if its required we might have to spray moderate amount of chemicals. Please know that we spend around Rs 14,000/- to get the produce tested for traces of chemicals before export. Please do not hesitate to consume grapes.

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Stevia

SURESH S

Stevia Rebaudiana is a plant species which is considered to be a natural sweetener, is a native of the sub-tropical, tropical south and central American regions. The leaves of this plant have been in use for about 1500 years. The local people of two regions in Brazil and Paraguay used the leaves as sweeteners for tea and medicines. This plant is perennial herb which can attain a maximum height of 90cm. The leaves of the plant are elliptic and the root system of the plant is extensive. There are 150 to 200 different species of this plant available around the world, but only 6 varieties that is stevia eupatoria, stevia ovata, stevia plummerae, stevia salicifolla, stevia serrata and stevia rebaudiana are used as sweeterners. The most widely used plant is the stevia rebaudiana because of its extraordinary sweetening properties. The leaves of this plant, when dried and processed, are considered to have 300 to 400 times sweeter than sugar but with zero calories. It is believed that the plants grown at higher latitudes contain a higher percentage of glycosides, the sweetening compounds.

Why Stevia Cultivation?

Stevia (Stevia Rebaudiana) is an important commercial crop. It is mainly used as sweetner in food and pharmaceutical industries. The plant is originally from Paraguay near Brazil. It is cultivated in large scales in China, Brazil and South America, Global production of stevia products was 5100 MT in 2014 costing about USD 347million. It will increase and is estimated to go up to production of about 8500 MT in 2020 costing about USD 565 million. China is major producer and exporter of stevia products.

Post Covid-19 European & US markets are considering for a total ban on food related and other products from China.

This has opened a huge opportunities for Indian industries and exporters to scale up the production of stevia products to meet the global requirements, this in turn gives opportunity to Indian farmers to cultivate the stevia to feed to the existing and new stevia extraction units in India. Apart from the growing global market demand, Indians are yet to adapt fully to stevia sweeteners like in other countries but the demand for stevia products in India is steadily growing considering the fact that India has the highest number of diabetics in the world with growing obesity rate.

Stevia Cultivation has a very promising years ahead...

Advantages of Stevia Cultivation:

Stevia has a huge potential to disrupt Consumer Health, Farmers Income and Environment.

Stevia is perennial herb: It lasts for five years from the date of plantation, with the first harvest within 4-6 months and subsequent harvesting within every 2-3months for five years.

Adaptable to different climatic conditions: This plant adapts well to different climatic ranges around the world but exhibits higher leaf growth when cultivated in semi-humid temperature with good light intensity.

Very low water requirement: This plant is ideal for drip irrigation it requires a very less water in comparison to the other crops almost 1/10th of sugarcane plantation requirement.

Low maintenance cost: After the initial plantation expenses it has a very low maintenance cost for 5 years.

Stable returns for long term: Stevia cultivation provides overall high & secured returns to grower for 5 years

F&B industry to addressing the growing consumer sentiments for healthy F&B products & cementing the FSSAI initiative to reduce Calories via their “Thoda Kam” campaign.

In India, FSSAI has approved Stevia as a natural sweetener in 2015 with a gazette notification and almost 180 countries are using Stevia which provides scope for an export market. It will be a global opportunity for India to cater to more than 180 countries as procurement from China has ceased post COVID.

Uses of Stevia Leaves :

Currently consumers have more inclination towards products that are clamming themselves to be ‘ALL natural’ and ‘Low CHO.’ Hence, the food industry would grab a major share in the market if Stevia, the natural sweetener is used as sweetening agent in products like biscuits, jams, chocolates, ice creams, baked foods, soft drinks, soda, candies & also common beverages like dip tea, coffee & herbal tea that are targeted in particulars at the diabetics & health conscious consumer.

Health Benefits of Stevia:

- The compound glycoside present in the leaves has significant impact upon consumption.
- The characteristics that make it suitable substitute for sweetening are Control high blood pressure, obesity and yeast infections.
- Safe for diabetic patients
- Improves cardiovascular health
- Free of calories, compounds cannot be metabolized by the human body
- Helps in improved gastrointestinal activity
- Provides proteins, vitamins, minerals, carbohydrates etc.,
- Defensive against microbes
- No toxic elements
- No artificial agents
- Provides 50-400 time more sweetness than normal table sugar
- Prevents cavities and plague
- Safe for all ages

About us:

Swadeshi Stevia Farms & Nursery (associated company of Stevia Sugar Co.) is the suppliers of authenticated high stevioside content quality stevia dry leaves to the stevia extraction units. We cultivate stevia in our farms and also on contract farming with buy-back agreement.

We provide all the technical guidance, training and assistance for stevia cultivation. We grow medicinal crops as a inter-crop with stevia or as a separate farming depending upon the soil and climatic conditions and irrigation facilities available.

We have signed MoU with multiple stevia extraction units, Pharma companies, Traders and Exporters with annual rate contract for the regular supplies. Our present monthly requirement is around 40tons of dry stevia leaves per month.

We are basically into Stevia end to end solutions with offices and factories at Mumbai & Raigad. We are planning to set up extraction units at multiple locations across Pan India integrating with Stevia cultivation because of the growing demand post COVID. Almost 40% of the global market share & 20% of European market share was catered to from China pre COVID. However, post COVID the scenario has been changing. There is skepticism in terms of procuring from China. This means the 60% gap in demand is now open for other players in the global market and India has a huge opportunity to fill this gap to cater to the US and European markets."

Mr.Suresh believes that there is a growing demand in India as is evident from the 2015 budget approval for Stevia. However, in the last 5 years the requisite growth has not been achieved. Presently, it is catching up and there are a lot of incentives provided/promoted by the Government because it requires less water for cultivation as India is becoming a diabetes hub. Considering these factors and increased opportunities, India can contribute to the export gap of 60% which can be facilititated through opening of multiple extraction units across different parts of India.

"Estimates say that these extractions can produce between 300kgs to 1000kgs per day. In the past, there were a lot of difficulties that were faced by the farmers as well as those who set up the extraction units. But now, we are integrating cultivation along with extraction units so that there is sustainability for the farmers. Wherever, there is an integration of the extraction unit and cultivation, the farmer can have a stable income for 5 years. Also, this way these extraction units can meet the growing demand and contribute to the growing export market of India. There are a lot of small ways in which people are cultivating these crops but they seem to face problems and have a bitter experience as it is not being executed in an organized manner."

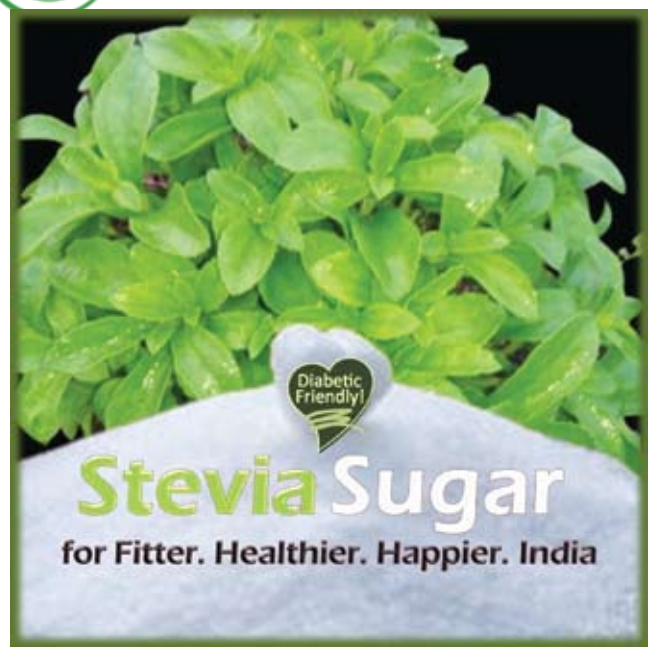
How easy / difficult it is to market Stevia?

Stevia crops are sold through 2 methods:

1.Selling it in the form of dry leaves in the open market but has a limited quantity of requirements.

2.The major chunk goes to the extraction units wherein it is converted to stevioside and rebaudioside which will go to the food industry, beverage industry and other activities.

Drying of Stevia leaves is also an important part of the harvesting process as when, how and how to dry are important stages of Stevia cultivation. Incase of over drying or left over moisture, the leaves become useless. Therefore the drying of leaves should start just before the flowering process as the content of rebaudioside and stevioside in the plant reduces drastically once the flowering is done.



Amateur farmers who are not aware of when, how and how to dry tend to do it after flowering and this affects the sweetness of the leaf. If it is going to be used as a dry leaf, this will not make a difference.

The Stevia extract demand is almost 500 tons per annum and supply is almost 300 tons per annum so there is a gap of around 200 tons in the Indian market because this is considering a 9 to 10% growth in demand for all the products. In the global market the demand for Stevia extracts is almost 8000 tons pa and supply is around 6000 tons pa, so there is a gap of about 2000 tons pa.

What kind of investment required for Stevia Cultivation?

In terms of investment, initially it requires a higher investment in comparison with other crops but there is a stable income.Considering that in the 1st year there is work and from the subsequent years there is minimal maintenance costs, maximum returns are expected.

Discussions are on with small groups of farmers in multiple locations and looking to integrate across pan India with locations of 150-250 acres of cultivation land.

Investors are ready to set up extraction units and tie up with farmers in those locations with a 5 years buy back agreement. This way, both the investor and farmer will be interdependent on each other as the payback period for the extraction unit will be almost 4 and a half years.

As a thumbrule, 1 ton of raw material should roughly give you an output of 100 kgs comprising of approx. 30kgs of rebaudioside and 70kgs of stevioside.

If the stevioside is not good, the output will come down to 60 to 70 kgs instead of 100 kgs and so the payback period can further increase to 6 or 7 years. Hence, extraction units owners prefer to have stevia dry leaves from the verified sources.

What is the estimated yield & profits per acre?

The yield per acre differs depending on the climatic conditions, sunlight, soil conditions etc. It varies anywhere between 1500kgs to 3500 kgs of a yield. Generally, the 1st year of the crop the yield will be less, the 2nd year to 4th year it will go up and from the 4th year onwards it will again go down to almost 1000 kgs to 1500 kgs. So an average of 2 tonnes per acre per year as yield is what can be expected.

The 1st harvesting will be after 5 to 6 months and the subsequent harvesting will be after 3 to 4 months again subject to location, climatic conditions and soil conditions.

In the domestic or export market, the farmers will not be able to directly approach the stevia extraction companies with a small quantities of stevia dry leaves as stevioside contents needs to be tested and verified.

Conventionally, anywhere between 1.5 lacs to 2 lacs is an assured return after incurring all expenses.

This crop is recommended ideally for someone looking for a stable return with minimum efforts for a longer period and also towards water conservation.

Even the government is looking for alternatives for sugar. This crop also contributes to water conservation.

The 1st harvesting is within 6 months provided it is sapling cultivation. Once the harvesting is done, every 3 to 3.5 months it starts flowering or upto maximum 4 months.

Once the harvesting is done, it has to be dried for 24 hours with good sunlight or dried in a hot air chamber at 50C for 6 hours. It will not lose its color and remove its moisture. Most people in India are doing drying natural drying process. They cut it leaving 10cms from the ground level and then dry it in open air and then from the stem leaves will be taken off.

What kind of land / climatic conditions are required?

There must be free flow of water in the field with no water logging or stagnation as this can lead to root rotting. Germination takes time and hence, sapling cultivation is recommended.

The crop requires less quantity of water but it does require water throughout the year. Therefore, sprinklers or drip irrigation method is recommended.

Stevia is basically a sun plant. The longer hours under the sun, the higher theyield.If you have sunlight anywhere be-

tween 8 to 12 hours, it is good for the plant. We have harvested from Arunachal Pradesh to Nagpur where the climate is two different extremes, but still the crops have yielded well.
Too much of rain is not conducive for this crop. 1800mm of rain is sufficient for a year.

Can it be grown as an intercrop?
Generally, not recommended as it requires more sunlight. If it can be managed to maintain the distance and receive adequate sunlight it is possible.

Is there too much labour involved?
Not much labour force is required for stevia cultivation - a lot of automation has emerged i.e., watering and controlling through drones, etc.
India has not yet started using it. There are machines available for harvesting also that cut 10cms from above the ground separating the leaves from the stem on the field itself. It has to be directly taken and dried in the chamber. In general, nobody has gone to super automation of Stevia cultivation as of now.

Should the crop be immediately processed?
Yes, it should be immediately processed.
If the Stevia leaves are dried properly removing all the moisture, then it can be stored for many years. In case it is not dried properly and there is moisture, it will develop fungus and there will be discoloration and it will not be marketable.

Are there any government incentives available?
The government is providing some incentives like subsides for stevia cultivation upto a maximum of 30 lacs per farmer. This will take some time but will add to the farmers profits. National Medicinal Plants Board are strongly encouraging growing these medicinal plants and they are giving a 20% subsidy. There is a special scheme called Voluntary Certification Scheme for Medicinal Plant Produce (VCSMPP) that is strongly encouraged. Stevia is probably one of the best.

Do you provide consultancy for farming i.e, growing, cultivation and other things?
There is a team of experts available for that and it is chargeable. They will give you a quote and make 2-3 visits to your farm and will guide you.
Even when we go for overseas markets, our team goes there and trains them till the 1st harvest. In India, you get 2-3 visits and guidance until you are familiar till atleast 1 or 2 harvesting and till you become self reliant.

Can the boiler which is used for Geranium extraction be used for Stevia extraction or is it different?
It is not the boiler which comes in to the picture for the extraction unit. It is an entirely different extraction technology that we have to use. If you have set up a geranium extraction unit which comes up to almost 10 to 12 lac rupees, the stevia extraction unit plant and machinery is an entirely different set up. One ton of extraction per unit cost on plant and machinery goes up to around 3 cr, before raw material and infrastructure. It is a 6 to 7 crore project. So the small geranium extraction unit will not cater to the Stevia extraction unit. The technology is different.

Don't you require clusters to set up these extraction units?
We have extraction units in Nagpur, Nasik, Ahemdabad, Lacknow and Arunachal Pradesh. We are under discussions for setting up additional extraction units in other parts of India. We will ensure that clusters are spread all across India so that we can cater to all the requirements across markets.

What is the cost of setting up a plant?
As a turnkey project, considering your working capital it is around 6.5 to 7 cr.

Contact us or Write to us for further Information.
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Dr. T Rajula Shanthy

Prinicipal Scientist & Head, Agricultural Extn
ICAR- Sugarcane Breeding Institute, Coimbatore

India has been cultivating sugarcane since time immemorial. Sugar industry is the second largest agro based industry, next only to textiles.

Sugarcane Breeding Institute, Coimbatore was started in 1912 with the objective of evolving sugarcane varieties suitable for cultivation in sub-tropical India for improving sugarcane productivity. The climate here remains flawlessly suitable for optimum flowering and seed set under natural conditions. The institute formerly under the Government of India became part of the Indian Council of Agricultural Research on 1 April 1969.

The first breakthrough in sugarcane improvement was achieved when Dr C.A. Barber and Sir T.S. Venkataraman made the first deliberate cross between a noble cane variety, Vellai and Saccharum spontaneum. From this cross, the first commercial hybrid of the country, Co 205 was released for cultivation in the Punjab province in 1918. This hybrid showed higher productivity and better adaptability compared to the varieties in cultivation. This finding of producing hybrids in an otherwise vegetatively propagated crop has revolutionalized sugarcane crop and the sugar industry. The first generation hybrids were then back crossed to Saccharum officinarum and also crossed with Saccharum barberi to produce a range of improved hybrids. The best of the early Coimbatore hybrids such as Co 281 and Co 290 became popular not only in sub tropical India, but also in Australia, Lousiana, Natal Argentina and Brazil. Since then, many of our hybrids have found acceptance all over the world in more than 31 countries not just as commercial varieties but also as parents to develop local varieties. Over a period of 101 years from 1918 to 2018, we have evolved around 3260 Co canes i.e., Coimbatore canes.

Sugarcane is a flowering plant, which starts flowering in October and goes till December in Coimbatore. From farmers' point of view, they don't prefer sugarcanes to flower and for them it is always a vegetatively propagated crop. They just grow cane, cut into small bits and they plant it for the next season. Hence, whatever properties the plant crop has, the progenies will acquire the same and new varieties cannot be produced this way.

Interestingly, sugarcane flowers and set seeds. Coimbatore alone has a very specific facility of natural seed setting from the sugarcane inflorescence. From this inflorescence, we get what is called fluff which contains a tiny seed covered with some cottony or cushiony growth over it. We defuzz the true seeds from the fluff and these true seeds are sown in the micro plots and then it goes for further screening and selection and that is how we develop new sugarcane varieties.

Sugarcane breeding to produce new varieties is a very lengthy process. It takes over 12 years to release a single sugarcane variety, so it's a very tedious and time consuming process.

Since sugarcane seed sets under natural conditions only in Coimbatore, we give this centralized facility for the rest of the country. We call it as the National Hybridization Garden and was established in 1972 under the AICRP(S) All India Coordinated Research Project on Sugarcane.

How many species of sugarcane are there?

Sugarcane belongs to the grass family Genus Saccharum. We have six species of sugarcane crop:

1. S. officinarum: It is chewing cane, which is used during festivals like Pongal etc. Saccharum officinarum derivative is always used as one parent as this is the major species from which sugar or sweetness comes. It is the basic and most important cultivated species involved in the development of commercial varieties of sugarcane.

2. S. spontaneum: Highly polymorphic species with wide distribution in tropics and sub-tropics. Tall erect canes, broad leaved, rhizomatous forms with long internodes. It has huge biomass and high flowering types. So if you make a cross between officinarum and spontaneum, the sweetness comes from the officinarum and the high yield and biomass from spontaneum. These are good ratooners and utilized in sugarcane improvement for biotic and abiotic stresses and yield components.
3. S. robustum: They are robust or thick canes and can reach up to 10 m in height. They are hard, woody with low sucrose and high fibre.
4. S. barberi: These are thin, short and hardy canes, tolerant to environment stress. It has fairly good sucrose content.
5. S. sinense: These are hardy canes with broad leaves, tolerant to environmental stress and

have fairly good sucrose content. Six groups have been identified.

6. S. edule: The inflorescence of this species is aborted and are edible. These inflorescence can be eaten raw or used as a sabji. In north east India, most houses have this in home garden and even in markets, its being sold. Of late, it's a big delicacy in expensive star hotels like bamboo shoots.

7. We have related genus as well. The related genera include Erianthus, Narenga, Schelorostachya, Miscanthes and so on. Luckily for sugarcane, you can have a cross between the species as well as between the genus, so both are a success.

We have over 110 sugarcane growing countries with 27 million hectares of sugarcane crop. Of the total white sugar produced, 80% comes from sugarcane and the rest 20% comes from sugarbeet.

What are the challenges in sugarcane cultivation?

Technically labour and water are the two main constraints faced by sugarcane farmers. Many a times, labour is not available and even if it is available it is unaffordable by the farmers. Sugarcane requires enormous amount of water too. So, under drought situation or scarcity of water condition, you will not be able to produce a good sugarcane crop. In India, almost five million hectares area of land is under sugarcane cultivation and we have to overcome these challenges.

I would say that rather than increasing the production, you should try to reduce the cost of cultivation.

Is intercropping feasible with sugarcane?

You can use any crop of 90-100 days duration as intercrop. Pulses would be very ideal. There are farmers who go in for sesame and even onions can be grown. Intercrops help sugarcane farmers to get an interim income within, say 100 days or otherwise they have to wait for 12 months to harvest sugarcane as it's a crop of one year. Intercropping of dhaincha or sunnhemp along ridges and incorporation of the same on 45th day during partial earthing up helps to increase soil fertility and also cane yield.

Can mechanization be used in sugarcane?

Of course, today mechanization is possible and we do have machines for every operation in sugarcane cultivation. Mechanization can save labour and time and reduce drudgery. The only limiting factor for sugarcane is less size of land holding. On an average, we say that the land holding for sugarcane is 0.7 hectares which is very small; Nevertheless, there are large farms where you can go for mechanization right from planting to harvest, provided sugarcane is planted in wider row spacing with a spacing of over five feet between rows.

What are the input requirements?

Sugarcane remains in the field for over 12 months as plant crop and 24 months minimum as a ratoon crop. So it needs lot of nutrients. Apart from nitrogen, phosphorous and potassium which are the primary nutrients, it requires almost 17 nutrients like calcium, magnesium, sulphur and lot of micro nutrients are also needed for proper functioning. If you apply, nitrogen, phosphorous, potassium without applying any micro nutrients even efficacy of the application of these fertilisers are lost.

The Fertilizer recommendation varies from 70 to 300 kgs of nitrogen, 26 to 125 kgs of phosphorous and 25 to 150 kgs of potash. Ofcourse, it differs with area. Every state has it's own recommendation and it is always better if you can go for soil testing and apply it based on that. Again, when it comes to the application of fertilisers, how much is applied matters. Farmyard manure or compost can be broadcast on the field at the time of the last ploughing. After the last ploughing, you open the ridges and furrows and phosphorous is always applied as a basal dose on the furrows.

The basic function of phosphorous is only for root development and it can be applied on the furrow rather than spreading it on the entire field,so that the crop as such can take it and nothing goes waste. Pocket manuring is ideal for ratoon crops. You need to open a small hole near the root zone and you have small devices also for pocket manuring.

After planting sugarcane in the fields, if we come across any micro nutrient deficiency like iron deficiency or zinc deficiency, it can always be rectified through foliar spray. But as a blanket recommendation, I would recommend all the cane growers to go in for micro nutrient mixture atleast once in every five years or every time when you go for plant crop. Fifty kg

per hectare of micronutrient mixture comprising 20 kg of Ferrous Sulphate, 10 kg Manganese Sulphate, 10 kg Zinc Sulphate, 5 kg each of Copper Sulphate and Borax. So, you can just mix this with 100 kg of well decomposed farmyard manure and apply it only on the furrows and can be rest assured that the micronutrient deficiency of the crop is also taken care of because it stays in the field for such a long time and slowly released to the plant when in need of micronutrients.

It is mandatory that you apply micro nutrients. We see that every ton of cane requires upto 2.08 kg nitrogen, 0.53 kg phosphorous,2.8 kg potash, 0.30 kg sulphur and traces of 0.034 kg micronutrients of Zinc, Copper, Iron and Manganese each. Nutrients are usually lost through erosion, leaching and evaporation.

In drip fertigated crop, the organic manures and phosphorous fertilisers are to be applied in the furrows before transplanting settlings or planting setts. The rest of the nutrients are to be given from the 5th week to the 25th week. So, we do not give any drip fertigation till the 5th week because the basic nutrients of the setts itself would suffice for the plant crop and 30% of Nitrogen and potash recommended for your area has to be applied during 5th to 12th week maybe, once in 5 days and the rest 70% of Nitrogen and Potash from 13th to 25th week.

When it comes to ratoon crop, it starts from 5th week to 25th week, so 30% of Nitrogen has to be given from ratoon initiation to 12th week and again from 5th week to 12th week onwards, you can start giving Potash and from 13th week to 25th week you can give the rest 70% of Nitrogen and Potash. When you find any micronutrient deficiency you can as well go in for 0.25 to 0.5% parasulphate as well as Zinc Sulphate spray.

Are biofertilizers recommended?

One should ensure that there is enough moisture in the soil because biofertilizers are living bacteria which is contained inside the packet or in the liquid medium and at any cost it should not be mixed with chemicals. The moment it comes in contact with any chemicals, it gets killed.

What farmers should do is, there should be atleast 10 days gap between chemical fertilizer and biofertilizer application, that is why it is recommended at 30 and 60 days after planting, you have to go in for biofertilizer application.

Top dressing of nitrogen and potash has to be done during 45th and 90th day, so that you give enough room for the fertilizers to just multiply in the field and immediately after applying biofertilizers, you have to irrigate the field, because this bacteria needs sufficient moisture to multiply itself and maintain its population.

If one uses biofertilizers, it saves nitrogen and phosphorous and there is always an increased cane yield of 8 to 10 tons per hectare. Your biofertilizer package is about Rs.22 to Rs.25 per kg and the recommended dosage is 10 kgs, so you hardly spend Rs.250. Even if you spend Rs.1,000 for application, the cost is maximum Rs.1250 to Rs.1500/-, so for this amount you get 8 to 10 tons. It also improves the use of other applied fertilizers and in the long run it improves the soil health also.

Most cane growers use another technology that is de-trashing. Many do not go it for want of labor. The dry leaves of sugarcane is called as trash. De-trashing is the removal of dry sugarcane leaves. In sugarcane crop, a single plant will have 30 to 35 leaves but hardly 8 to 10 top leaves are productive or functional,all the other leaves are just utilizing the stock of nutrients in the plant. On 5th and 7th month of crop age, de-trashing has to be done.

De-trashing ensures that sucking pests becomes very less. Normally, these pests like mealy bugs, white flies, pyrilla cling on to the leaves and remains inside.

Once it is exposed, the hiding place is disturbed and reduces infestation of sucking pests. The field will be clean and there will be enormous penetration

of sunlight, once you have more sunlight, you have more photosynthesis, more photosynthesis leads to higher yield.

How is the hybrid variety different from the other canes?

In 1918, we came up with the first hybrid Co 205. Hybrid is crossing two parent varieties and this crossing is only effectively possible in Coimbatore conditions.

It is always different from the germplasm or the local ones in the sense that it will be a high yielder as well as high sucrose type. Farmer is always paid according to the tonnage of cane he supplies to the sugar mill. So he needs the sugarcanes to give high biomass and high cane yield. But, a sugar mill will always see for the sucrose percentage. Only the sucrose available in the sugarcane juice can be crystallized.

Sugarcane juice has so many sugars like fructose, sucrose, glucose, reducing sugars. Only the sucrose portion can be crystallized into sugar in the sugar mill. You will have to see for sucrose percentage which is the crystallized sugar, as

well as the cane yield and these two characters are higher in hybrid. From 1918 onwards, nobody goes for the original species. But as I told you in Saccharum officinarum, it is a chewing cane and for chewing cane, we don't do any breeding and we don't have any varieties, because once we go in for altering the officinarum, the outer layer becomes hard. So, even today very few people can chew cane because of teeth problems and canes are quite thick. So only for chewing, we use the natural officinarum species. Otherwise, whatever we recommend today are the hybrid ones.

Which soil is best for sugarcane cultivation and good varieties?

Sugarcane prefers well drained, well-structured and aerated loams to clay loams that are more than 1 m deep. Fertile laterite soil is also good and it again depends on the region. Sugarcane can equally be grown on soils with textures other than loam or clay loam.

Such textures nevertheless offer a number of disadvantages:

- In coarse textured soils, limited available water may limit plant growth and fertilizer losses by leaching may be increased.
- In fine textured soil, there may be long lasting drainage problems. Surface capping (essentially in silty soils) reduces the water penetration and aeration. Compaction futher hinders the root development.

You can go in for Co 86032, Co 0212 or Co 11015 in tropical region. For saline areas, Co 86032, CoV 92102, CoV 94101 can be used. You can try Co 0212 which is recently released sugarcane variety and is drought tolerant.

How much seed would be required to sow 1 hectare of farm?

Generally optimum inter row distance depends up on the tillering capacity of the variety, time of planting, fertility status of the soil and stress conditions like drought. Closer row spacings are adopted under low soil fertility status, shy tillering varieties, delayed planting, cooler and slower growing conditions and drought.

Choose quality cane of 6-8 months age free from pests and diseases. We need 75000 two budded setts per hectare for 90 cm spacing. Under wide row spacing of five feet, 60000 two budded setts are required.

Sugarcane setts are being planted in fields under farmer participatory mode and we are supplying it to the other cane growers because we do have limitations of area in our campus. There are 3 varieties - Co 86032, Co 11015 and Co 0212 which are being grown. You can write to us saying that you need planting material for so many acres and what we normally do is, based on the demand that we receive and amount of planting material we have, we just give it to the farmers.

We have tissue culture unit also. Last year, we produced almost 1 lakh tissue culture plants which we supplied to the sugar mills and also the individual cane growers came to us and got it.

What is the price range?

Tissue culture plants cost Rs.10 per plant. Setts are sold at Rs.3500 per tonne of cane.

Does organic cultivation result in less production?

No,initially you have a conversion period of 3 years. As sugarcane is a 12 months crop, unlike other crops for 3 years you will have a reduction in yield because the soil has to get acclimatized to the microbes and after 3 to 4 years it will be stabilized. There are so many farmers who go in for organic sugarcane cultivation, they have their own jaggery making unit, they produce organic jaggery or you have value added jaggery.

All these things are possible. We have specific technologies and maybe you can write to us and we will send you a brochure containing all the sequence of practices. We have given details on organic sugarcane practices in our website We have developed an android mobile app "Cane Adviser" in English, Hindi and Tamil and you can get all the information on sugarcane cultivation. It has a Scheduler app tailormade for each individual user based on the date of planting or ratooning.

Also, users can send their queries either as text message or photographs through the Query Handler app embedded in Cane Adviser. Its available in google playstore for free download.

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Dr. Mohammed Ilyas Rizvi IFS

Principal Chief Conservator of Forest, Government of Andhra Pradesh,

A gold medalist in Mathematics, a doctrate in Philosophy, a master's degree in Forestry, Environment and Wildlife, Dr.Mohammed Ilyas Rizvi has been the Additional Principal Chief Conservator of Forest, Andhra Pradesh for the last 7 years and principal Chief Conservator of Forests and Head of Forest Force in Andhra Pradesh.He is now Principal Secretary to Govt. Of AP. Admist the thick of the forest, Dr Rizvi takes our attention to Pterocarpus santalinus, commonly known as Red sanders.

"Red sandars is generally confined to grow in the forests of Andhra Pradesh. It grows like grass and it is highly regenerative. It is known for making decorative furniture especially in China and musical instruments in Japan. This plant does not naturally regenerate in all parts of Andhra Pradesh. It is regenerated naturally only in a few districts like Chittoor, Nellore, Kadapa etc."

What are the conditions conducive for its growth?

It requires dry land and gravel soilis is a natural habitat for this plant. It needs only naturalrains that is too quite less. It is known for it's red color. If bored, this tree gives out a red color liquid.

What is the scope of this timber in the market?

The red sanders has been categorized under the endangered species since 1995 and it couldn't be exported individually with out permissions from Govt. of India and CITES. Of late, you can obtain permission from the Government of India to sell red sanders timber. You need permission from the Forest Department to cut it and permission from Government of India to sell it. Once the permission is in place, red sanders can be sold in the open auction individually or via the forest department. There are three categories of timber here - Class A, Class B and Class C. Class A fetches you approximately Rs 60L per ton. Class B fetches you approximately Rs 35L-40L per ton. Class C fetches you approximately Rs 20L-25L per ton but rate depends upon prevailing market rates and demands time to time and no. of buyers etc. China buys a lot of red sanderswood from us to make furniture.

Does this tree grow outside the Andhra forests as well?

Other than in the particular few districts of Andhra, it is also grown artificially as well in other parts of AP. People collect seedlings from our forest nurseries and plant it. Andhra Pradesh, Karnataka and Tamil Nadu forest areas have planted a lot of red sanderswood plats as well. Private persons have also planted lot of plants on private lands.

You should not irrigate these plantation. If you do, its size increases and there will hardly be any heart wood formation. This is a slow growing plant, which takes at least 20-30 years. It require 2-3 watering sessions in the initial stages for 1 or 2 years during summers for the plants to develop. After that, there is no irrigation required at all. If you do, it will grow like a Neem/mango tree and will lose its value.

What is the cost of seedlings and can other crops be grown with red sanders?

Cost of seedling is not very high. It will be around Rs.50-100 per seedling. The

trees should be planted at a spacing of 3Mx3M. Amidst the saplings, for up to 5 years, pulses can be grown. After 5 years, the trees would grow to a height and because of the shade, it would be difficult to grow other crops.

What are the major pests and diseases that may affect this crop?
We have not observed any pest attack on this tree so far. If anyone faces such an issue, they may please consult the agriculture or forest department.
Theft is an issue with this tree. We seized a lot of timber that were cut illegally. Framers need to protect their trees after 20 years of growth for about 15 years while the heart wood gets developed.

Any proven methodologies to protect the red sanders?
There are various methods. You can put a trench around your farming area or do an electric fencing. There are sensors available today or even have CCTV cameras set up in your field. All this needs to be done only after 15-20 years. Before that no protection is required.

What is the cost and profit of 1 acre red sanderswood cultivation approximately?
Estimated cost of 1 tree with a 75cm girth at the breast height, the heartwood would weigh up to 72kg. This can fetch you a of Rs.3 Labout Lakhs

Is it true that chips are available today which if inserted into the tree triggers alarms if people try to cut it?
It is a viable option. In England, they have taken up roadside plantation in which they have inserted chips in them to discourage illegal felling of trees. Even if the tree is cut and transported the chip leaves a trail and can be reached. In India I haven't heard of anybody using it yet.

Can oil be extracted from red sanders trees?
No, this tree doesn't give out a lot of oil. This tree seems to have a lot of medicinal properties which is yet to be established. Having said that, each and every part of this timber has its own uses and so can be encashed.

Does the red sanderswood have multiple varieties?
It grows like grass in the forest. In the rainy season, the seeds that would have fallen to the ground sprouts and grows. Therefore, tissue culture etc has not be attempted. There are 2-3 natural varieties available. These varieties are not very different from one another.

Considering the length of time required for growth, does this plant make sense when it comes to a cost-benefit ratio?
It does because this tree doesn't require much water. Also in gravery soil, there is not much you can grow in that type of soil. So, such types of perceived wasteland can be converted into farming red sanders.

Can the seedlings be brought from the forest department?
Yes, there are lot of nurseries in Kapdappa, Chitoor and Tirupathi areas from where you can buy the plants. These are nurseries established by the forest department.

How well would this tree grow in the Western Ghat forests?
It will be difficult to grow in that area owing to the high rainfall in that area. It can be grown but the mature tree will lack the quality you would look for. This tree doesn't require much water at all.

Are there any subsidies or schemes available from the forest department to encourage tree plantation?
For growing trees on agricultural land, we supply the plant material free of cost. Farmer can collect seedling free of cost generally in the rainy season - June-August. There are no subsidies.

Is it safe to grow these trees on private farmlands?
This tree is a very expensive tree. Up to 15 years when it is a young plant, there is no risk involved. After that once the heart wood starts forming, the scenario begins to change because each tree has the potential to fetch several lakhs. Hence, it must be protected well.

Tree plantation is risky owing to the time it takes to grow - your comments?
I agree that tree plantation can be expensive and risky in terms of time. But it is almost hands-free cultivation. There is no water requirements. In fact, if you water it may grow bulky but the heart wood quality goes down. So, cost of cultivation is less and the profits in the making is huge. So, I don't think anyone is at a loss.

Do you have buy-back arrangement with farmers for red sanderswood trees?
We do not have a buy-back arrangement because the cost of the tree is high in the international market, not in the domestic market. There is a sea of difference between domestic and international market values.
Also there is a lot of paperwork involved before any thing can be done because this tree is an endangered species.

What challenges do you face in increasing red sanderswood cultivation in Andhra Pradesh?
We are not facing any challenges in terms of cultivation. But yes, getting permissions for international sale is difficult. Once that is done, the tree sells like hot cakes.

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Dr. Subramani K K

Agri Scientist

Avinash K S

Founder – Agrimaa Bioscience / Director – Vivanta Seeds Pvt Ltd

Dr.Subramani passed his B.Sc and M.Sc Agriculture from the Univerty of Agriculture, Bangalore. He then worked as a Horticulturist with the Government of India with SFCI Tamil Nadu. After that he pursued his PhD and got into vegetable breeding and was the owner of a seed company. Today, he runs an NGO.
His Son Avinash KS got into the business of Seed Specifically Papaya in the Brand of Agrimaa Bioscience & Vivanta Seeds Pvt Ltd as there are a very few companies focused in Papaya Crop & the Requirement of Papaya seeds by the Indian farmers is big .
"I run an NGO teaching Sanskrit free of cost to girls across the country. I also get these students educated on papaya breeding. Papaya Breeding is the income source that keeps this NGO afloat." – Dr Subramani KK

Why Papaya?

Papaya is a fantastic crop for the Indian climatic conditions. It can be grown throughout the year. 2-3 decades ago papaya was a neglected crop but with research its value has gone up. Ever since Taiwan introduced their variety, papaya's popularity shot up because of its color, taste, shelf life etc. Now papaya is cultivated in lakhs of hectares of land as a main crop. We also have it in many fields as an intercrop.

Today India is the highest producer of Papaya followed by Mexico. Other western countries are at a disadvantage when it comes to papaya because it cannot be grown round the year owing to their cold winters. Payapa is being used as a value added produce after the 4th harvest - papaya candy, dried papaya, papaya jam etc. The fruit itself has a huge potential for export mainly to the Middle East. During the Ramdan time, there is a huge demand for Papaya. In short, Papaya has high potential and is a highly profitable crop. Papaya fruit has lot of Medicinal / Health benefits that aids in good digestion & wide Industrial usage Domestically & Internationally.

Being a scientist and plant breeder, it perplexed me that we had only one suitable variety in Papaya & it is 100% imported & INDIA is dependant on a Single Nation for the seeds being one of the Largest Producers of Papaya . So, I took it as a challenge to develop an Indian Papaya version which could possibly replace the imported version of papaya. Since the last year we have launched another breed called F1 Agrimaa Red Glory 186 (Vivanta Red Prince) through our company Agrimaa and have delivered it to the government personnel. We have now exported the seeds to Mexico, US, Africa, etc.

Even in India we are cultivating this breed on a large scale in many places. The Positive response towards our product is increasing Day by Day.

The Taiwan Hybrid and the Agrimaa Red Glory 186 is highly tolerant to ring spot virus, which is a global phenomenon.

Globally, among farmers, there is a huge demand for female produce - the round variety and herma/bisexual variety which is oblong. There is no demand for the male version as it does not bear any fruits . Papaya plants can give 70-80 fruits weighing an average of 1 kilo to 1.5 kilo per fruit in a period of one and half years if the Farmer manages the crop very well.

This can fetch you an approximate income of 7 lakhs in 18 months per acre. Cost of production will come around 2 - 2.5 lakhs with the best agri practices. That is a net profit of 4-5 lakhs from one acre of papaya cultivation. People usually prefer shipping it to North India - Delhi Kolkata, Maharashtra etc. Also, exporting is a viable option.

Which variety is best suited for Tamil Nadu?

For Tamil Nadu all the varieties are recommended. In particular, red lady is very popular. The variety agrimaa red glory 186 (Vivanta Red Prince) is also absolutely recommended for both latex extraction which can be sold for tuti fruity development which is huge in Tamil Nadu.

What is the export rate?

Per fruit you can expect a net profit of Rs.20-30 after all expenses with strict Fruit Quality parameters which can be achieved with very good Cultivation practices. In India, the rate is Rs.10-12 per kg. Only red lady and now Agrimaa red glory 186 can be exported.

Do you help with marketing papaya produce?

I am a scientist, so no. Also, marketing the produce is the burning issue for all produce across India. Everybody is willing to experiment but nobody is willing to guarantee marketing even before the pandemic situation we have now. Marketing is a puzzle each farmer will have to crack.

Do you foresee any change in terms of production area with respect to papayas?

This is a period of high uncertainty for everybody including farmers. Owing to the uncertainty yes, cultivation areas are shrinking because of the fear that prevails. But smart farmers will take this shrinkage as an opportunity to play their cards better. It depends on how each farmer processes their thoughts. Also , the Agriclture Produce (Fruits , Vegetables , Pulses) will increase rapidly as Everyday we have increase in consumption. Agricutlure / Food is Staple to the Mankind.

How can papayas be best grown in North India - Punjab and Haryana belt?

These regions have extreme climate. Papaya cannot tolerate extreme temperature - it can neither take extreme heat nor extreme cold climates. South India has a very equitable climate and hence it can be grown round the year. So, in North India it is recommended to grow papaya after the winter season passes out - that is after Feb - March the nursery activities should begin. By May-June the seedlings should be ready to be cultivated and then by year end you can harvest. Seeds of Agrimaa Red Glory 186 is available in seed markets. You can get to see the plant varieties in Jharkhand , UP , Madhyapradesh and Bihar. It is successfully growing in these areas provided you take care of the time period to sow. The planting density should be around 6.5 ft row to row & plant to plant

What is the life of the papaya plant?

Given you are providing the best agro practices, the life of a papaya plant is

2 years. The first fruits begin from the 8th month and it will bear fruits continuously upto 1 and half years from the date of transplanting. After that, even in the last 6 months you get very good fruits.

Do you have any technology for processing fruits into value-added products?

This crop is highly suited for turning into value added products. I am told that in a place called Palacode in Dharmapuri District they have installed the government of India subsidy funds for papaya drying machines.

Farmers can give their papayas there and within 8 hours the papaya fruits can be reduced to dried papaya, stored and sold within 2 years time abroad or in the local market without sugar or preservatives. Papaya jam is in huge demand. I visited CFTRI, Mysore. They make Papaya Jam using organic jaggery. This is in high demand in the UK. Likewise, there is huge potential. Also, if Mexico is delivering papaya fruit around the globe, so can India. Nowadays, the government of India is providing a lot of funds for post harvest technologies.

Do you supply papaya plant saplings?

I run an education institution for girls and they have first hand experience in papaya breeding, cultivation, seed extraction, packing. They raise papaya seedling on order and supply it to many places across India. It is supplied at Rs.10 and this money is used for the benefit of students. They earn while they learn.

Is the Agrimaa Red Glory 186 version suitable for Madhya Pradesh?

Yes, we have supplied to Madhya Pradesh already and it is coming up very successfully.

Is Agrimaa Red Glory 186 resistant from ring spot virus?

To come up with a resistant version, will take some more time. I am currently working on that. Very shortly, I will come up with a highly resistant variety. At present it is highly tolerant but not totally resistant. Despite virus attacks you can get a good yield.

We have a Yellow Flesh Papaya AGRIMAA YELLOW QUEEN which we will launch shortly which has excellent taste , Yield & Highly Resistant to Ringspot Virus. It can be even alternative to the massive Mango Pulp Industry such high quality is the product.

What can we do to improve the number of flowers in a papaya plant?

Papaya flower dropping can be due to different factors like high temperature or excess water / rain sticky soil. Papaya grows in black sticky soil but flower dropping is a risk. Black soil retains too much moisture which hinders the nutrient intake of the plant & Moist Soil can increase the Fungal & Stem rot problems. Provide the crop with enough organic matter. This will enhance the flowering.

How is the Red Glory version superior to the Red Lady version?

Both these versions are highly identical. They look alike. The difference is when you cut the fruit, the pulp of red glory is thick compared to red lady. This pulp thickness gives you 20% more weightage than the red lady and it's shelf life is also better. Other than that everything is the same - the looks, the taste, the keeping time etc.

What fertilizers are required to be given to the crop?

Agriculture is an ocean and being a plant breeder I am not quite the right person for this question. But I do vouch for the fact that papaya requires excess organic manure like cow dung or vermicompost especially liquid vermicompost (amruthajalam). People tend to make a big pit, deposit all the organic matter and then plant the plants above

it. That is a wrong practice. First, the plant has to start developing roots and once the roots run deep the fertilizers should be given.

What are the problem areas and mitigation options in papaya cultivation?

Availability of genuine seeds was a big question for the last 30 years. Now it is mitigated. Owing to this non availability, nursery men started mixing up hybrid seeds with segregated material. This led to the destruction of the papaya cultivation because quality was lost and it led to 50% germination. Monopoly of Foreign Company is there as Farmers dint have any options as alternative. Now, this is solved since hybrid seeds are available in India.

Currently, there are two areas where farmers may face an issue:

1. The papaya seeds cannot be stored for a long time. Papaya seed viability is only between 1-8 months because it has oil content in it. This one challenge farmers should be aware of so that you can always procure fresh seeds for cultivation and immediately upon purchase it must be sown.

2.Another factor is that the crop needs water but water stagnation should not be there.

3. Also, the crop requires heavy organic manure. You can dump organic manure into the soil for papaya, it will happily feed on it. After eating papaya if you throw the seeds to where you dump natural waste, the papaya plant will tend to grow.

4. Farmers should plan for the harvest which will fetch them a good yield. For example, Ramzan, Dusshera etc should be kept in mind while planting papaya. The fruit is on high demand during this time.

5. Ringspot Virus Management with Excellent Cultivation Practices is the key to overcome the Virus or any other Disease Problems

What could be the ideal time for transplanting papaya plants?

As a thumb rule it is before winter starts, papaya should have gone into the main field and should have reached the first flowering stage. That is, it should have attained stability. This way during winter, the flowering develops and the fruits will begin setting. Before summer, the fruits should have been set and the farmer will be able to gain good returns.

Is high density plantation recommended for papaya?

Papaya needs direct sunlight and will not tolerate any kind of shade. A leaf of one plant should not overlap with the leaf of another because they need heavy photosynthesis which will enable them to bear 70-80 fruits per plant. Therefore, the spacing should be sufficient so that leaves do not overlap.

How do we procure seeds and how much will we need for an acre of plantation?

For one acre we will need around 20 grams of seeds. You may contact us through our website to procure seeds. Email : agrimaabioscience@gmail.com

Would you recommend an agricultural newbie to start with papaya farming?

Oh yes! I would highly recommend it.

What technologies would you recommend for harvesting papaya?

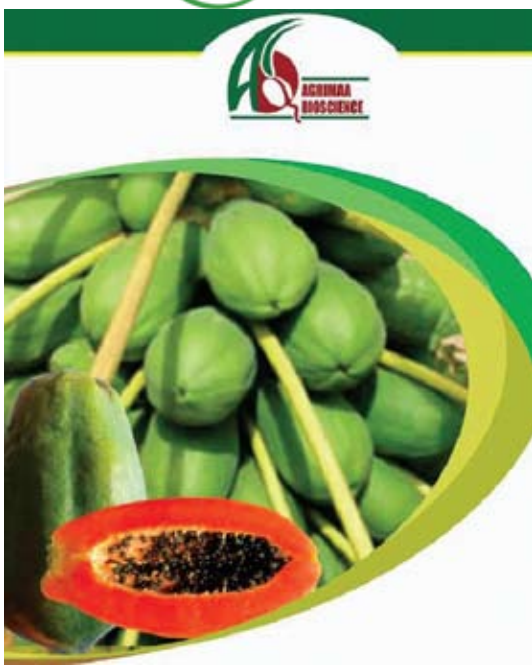
This is again not a question for a scientist. But in general harvesting should be done when you see a yellow streak on the fruits so that it can withstand 7-8 days of transportation to Delhi, Kolkata etc. The harvesting is done manually. Right now I don't think there is any other alternative.

Up to what height would a papaya plant grow?

It is a medium height plant. The lowest fruit will be about 1 feet above the soil and the highest fruit will not be more than 5.5 feet above the soil.

Is there any literature available as reference for planters?

As suppliers, we also give planting details and tips along with the seeds, to support farmers. This is available in Hindi and English. You can also email us your questions.



Should we replant papaya after 2 years?

We don't advocate crop after crop because the soil would be exhausted supporting papaya plants. There are chances for nutrition drain after one session of the crop. Also, the virus can be a bigger threat if you continuously replant the same type of crop. We always recommend crop rotation. This way soil will be replenished. If Papaya only is to be planted New pits for transplanting has to be done in the field.

Is the Agrimaa Red Glory 186 version resistant to nematodes, mites, aphids etc.?

The Agrimaa Red Glory 186 version is like any other papaya hybrid. These insects you mentioned are all entomological aspects. When a plant is very healthy, it usually will not attract any insects. Insects attack a plant when it is weak. Even then, some amount of insects may attack it. But overall papaya requires very less amount of insecticides/pesticides. Also, nematode has nothing to do with papaya. It is a issue affecting the soil. This can be solved only by amending the soil.

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Rajeevan Narayanaswamy

Consultant, Spirulina Cultivation

Founder and Managing Partner of Aquaseal Technologies, Mr.Rajeevan N, is a huge spirulina enthusiast.

"I have been working in the field of manufacturing, producing and cultivation of spirulina since 1993 with the CFTRI technlogy. We are doing this business for the past 25 years catering to the nutraceutical industries for spirulina powder, olga powder. At CFTRI, the plant cell biotechnology department, Dr.Sharada and Dr.Chavan have given us an opportunity to use this spirulina & convert it in to normal chikki."

This pandemic phase calls for people to developing their immune system. Spirulina boosts the immunity in the body. Blending spirulina with this groundnut/peanut chikki seems to be a tasty way of building immunity.

"A person gets a minimum 1gm of spirulina daily from a 40gm chikki bar. We currently supply it to many places including police stations, COVID-19 frontline workers and people are loving the product. Our brand is called as Aquaseal Nutra Spirulina Chikki. We have not yet started retail marketing because it needs the proper channel. Currently, we operate through our network."

How was this idea conceived?

The content is basically a combination of jaggery and groundnut. As per CFTRI recommendation, we use the purest form of cardamom oil to mask the fish-like odour of spirulina. The product is licensed from CFTRI to produce and sell the product.

At CFTRI there is a department called traditional food sensory sciences headed by Dr.Chethana who conceived this idea. The mixture should be prepared as per a specific ratio and is patented by the CFTRI. It has been tested for immunity benefits.

What are some of the challenges you face?

Currently, we have a capacity of 500 kgs per day. This is manual work. We aim to increase our production to a ton per day with the help of the requisite machinery. The basic seed for spirulina is supplied by CFTRI itself thus ensuring its purity. Jaggery and groundnut are the key ingredients in this chikki. The peanuts should not be contaminated with aflatoxins. Fungal contamination is more in peanuts, so we have to be very careful and we are procuring this from Gujarat. There is a huge plant in Gujarat where it is properly roasted and processed and supplied to us. It is organically grown variety which is grown in and around Gujarat. Jaggery comes from Tamil Nadu, which is also organic.

Does the nutrient content of spirulina change with the addition of jaggery, peanuts etc.?

CFTRI's technology ensures no change or deterioration of nutrient content in this process.

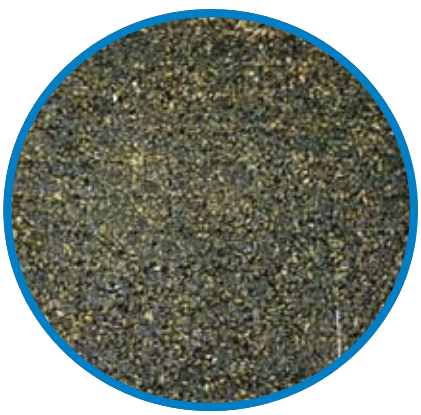
What are the terms and conditions for working with the CFTRI?

We cultivate spirulina and have been in the business since the last 25 years. We have technically collaborated with CFTRI on a regular basis. In case of any issues, we contact them.

In terms of monetary relationship, initially you have to pay a certain amount. There is no annual payment and additional activities will be charged. In case of any problem, an MoU will be made and will provide their valuable suggestions pertaining to the issue.

Do you have to sell under the CFTRI brand name?

We have not used their brand name, but



we do use their logo, as per agreement.

Does it help if the 1gm spirulina in a 40gm bar is increased by 10%?
It doesn't work that way. The combination of components are as per CFTRI recommendations. We cannot increase the percentage as it is a readymade formula from the CFTRI, which we have to follow strictly. Daily intake of this product boosts immunity.

What is the price for a 40gm chikki bar?
We are supplying in kg packets. Our cost will be Rs.300 per kg plus GST.

Do you supply across India?
We are supplying to Karnataka and Tamil Nadu. We are penetrating the Gujarat market as well.

What is the shelf life of this product?
It is 90 days from the date of manufacture.

What is the net profit ratio per day for a month?
The capacity is 500 kgs, but we don't necessarily produce 500 kgs everyday. There is a minimum 20% profit.

What was your approximate investment for 500kgs capacity?
Nearly 50 lakhs.

What is the awareness level of people about this product?
It is pretty good considering that we get a minimum order of 100 kgs quantity for supply.
There is awareness created via TV, WhatsApp and other social media. During this pandemic situation, in Karnataka, 9TV, Public TV had come to our facility and conducted interviews at our production facility.

Do you give consultancy regarding spirulina cultivation to others?
Yes, we do. We have developed 2 production units in Karnataka in Shiggaon and Tumkur. They were 3rd partied and we helped them set up the unit. Basically, spirulina cultivation needs land and enough water. If it is own land, it will be more profitable. If you have 5 acres of land, to produce 500 kgs daily, you need an investment of 50 lakhs. The set up we made in Hubli was for 20 acres and Tumkur it was for 5 acres.
We also have a buy back policy.

Can you tell us more about spirulina and its nutritional benefits?
Spirulina is basically a natural protein-rich, easily digestible food supplement. It is a microscopic plant grown on raised bed ponds. It is rich in amino acids, all vitamins, minerals especially B12 and the pigment level chlorophyll, betacarotene,phytocyanin (purest form of protein) Photocyanin has a key role in cosmetics, cancer treatment, natural food colorant. The byproduct of spirulina is a big investment as well.

Can this product be termed organic?
Yes, it is certified as organic.

Are there people growing it inorganically as well?
75% are going for conventional method and only few people are growing this organically.

Any plans on getting into the retail market?
We have contacted the state level authorized people in our network. It will be made available in shops all over India very soon.

Any last piece of advice before we close?
In this pandemic situation, people should try and use whatever organic products they can get hold of and go back to the traditional way of life. Get back to basics, maintain hygiene and use of this product will be more beneficial to society.

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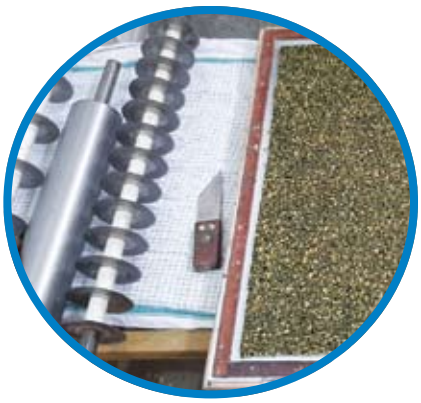

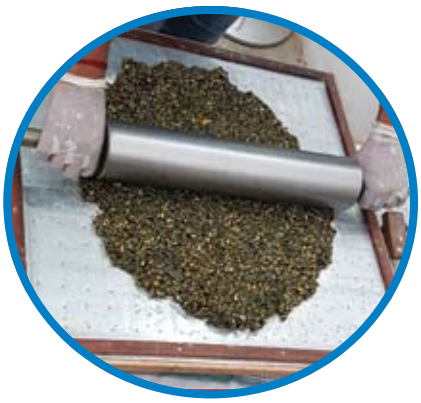

Sebastian Britto Raj

Assistant Executive Engineer
Dept of Agriculture Engineering, Kodaikanal

As an agricultural engineer, Mr.Sebastian Britto Raj is responsible for providing consultancy and training on methodologies to convert rain-fed agricultural lands into sustainable irrigated lands. He steers farmers to the right kind of agricultural machinery and helps them improve ground water conditions. Mr. Sebastian Britto Raj in his talk with us discussed about Neem Cultivation. "I have about 8 years of experience in dry land agriculture, having worked in 6-7 highly dry districts of Tamil Nadu. One thing I noticed is that we have quite a large quantity of agro forestry bestowed on us. But, for the last 10-12 years we only had minimum rainfall not just in Tamil Nadu but in majority of our states."

What do you think are the main challenges in agriculture?

We have 2 prominent monsoons in our country - South West Monsoon and North East Monsoon. But seasons are not timely in many of the places due to which farmers face a lot of acute problems. It starts with when to begin cultivation and how to progress keeping in mind the dynamic weather changes. Adding to this we have a lot of land which is not farmed and hence the increasing amount of dry lands. We have many such lands with a lot of ground water potential. But due to uncertainty of water availability, people are hesitant to pursue agriculture.

On one hand we have increasing population and in comparison, the size of agricultural land is on the decline. This sends food security into a questionable space. On the other hand, cost of farming is gearing up with the sale cost of agricultural produce dropping.

How does Neem Cultivation help?

In the prevaling conditions we have to proactively look into other options to occupy our dry lands with profitable agriculture. This calls for beneficial Agro Forestry which reaps quick results. There should be a sustainable model developed. Neem trees are of great value and can help achieve this model.

Neem trees exist in most of our states including Rajasthan and Orissa. It is only devoid in the Himalayan regions. It is a highly profit bearing tree and today it is simply unnoticed and undervalued.

Currently, all the state governments have come up with a lot of programs to gain traction towards Neem trees. This can improve the rural economy of any state. By growing Neem trees, in addition to bringing a lot of our land under cultivation you also carve yourself a regular income right from the 6th month of cultivation.

The neem tree has the advantage of being a raw material to many industries and also it doesn't need much care or attention during the course of its growth. It can grow in most soil varieties, except those that tend to hold water. Also, it cannot withstand very low temperatures. Among trees, Neem is perhaps the only tree that can get you a monthly/fortnightly/quarterly/annually income.

What is the flowering season for Neem?

Trees flower generally in April - May and it gives fruits in June and July. It bears flowers within 6-7 years of its

lifespan. One tree can give you approx 20-30kg Neem kernel and the cost of the kernel ranges from Rs.15-50/- per kg.

What climatic conditions are suitable for Neem?

Neem tree is prevalent in UP, Bihar, Orissa, Maharashtra, Gujrat, Rajasthan, Karnataka, AP and Tamil Nadu. It grows well upto a maximum temperature of 42.5 deg Celsius and upto a minimum of 4-21 deg Celsius.

Why Neem?

Neem has a lot of advantages as a crop, like:

1. Neem can be grown in most regions.
2. The tree can retain soil nutrients.
3. The extensive root system makes neem drought hard.
4. Neem improves the micro climate in the area where it is grown.
5. Shedding of leaves and kernels improves the nutrient value of the soil in which it grows.
6. All parts of the Neem tree is useful - the bark, the timber, the leaves etc.

In one hectare you can grow about 150 trees. So, why not Neem?

How does Neem help in climate control?

If you at least have upto 4 neem trees per acre, you can vouch for reduced climatic temperature of the area.

What is the harvesting methodolody for Neem?

Fruits should be harvested by shaking the branches - do not pluck. They should be harvested early morning. Semi dried fruits shouldn't be harvested as it can transmit diseases to the other harvested fruits. Keep fruits harvested each day in separate bags. These fruits can be stored in any dry and shady place. Just take care not to store them in plastic bags.

Tell us about the value-added products we can source through Neem?

- Neem Oil: The main critrea here is the color of the oil. The lighter the shade the higher the price.
- Neem Seed Crushed Powder: Seeds can be crushed directly and used as an input for agriculture. This is highly beneficial for farmers cultivating horticulture crops or sugarcane. It is a plant protector.
- Neem Cake: Once neem oil is extracted you get neem cakes as a by product. Unadultered neem cakes are in high demand.

Neem Seed Kernel extract, neem seed crushed powder, neem soap and neem cakes are in high demand among organic cultivators. It can fetch you a good revenue.

What are the major pests and diseases that the neem tree is prone to?

Neem is a plant protector. The only pest that it is vulnerable to is the fruit fly which is destroying a lot many neem trees in Tamil Nadu. These fruit flies rests on the tip of the neem branches and eventually destroys them and extends the destruction right to the bottom of the tree. This can be avoided by spraying neem oil or agniastra or a bio pesticide called Beauveria Bassiana.

What is the price of the oil extractors?

Neem oil extractors depends on the place you are purchasing it from. In Tamil Nadu it ranges from 1.5L-1.95L. Metal extractors cost 1.5L and if it is made of vaagai tree it costs higher.

How can one go about collecting and aggregating seeds of abandoned neem trees?

You can employ local personnel to collect the neem fruits / seeds. You can come into a agreement to pay them.

How can I dry these seeds during monsoons?

During the onset of monsoons, ensure you remove the mucus from the kernel and dry it in the shade. If sunlight is not available it only takes a little longer to dry, that's all. No harm in drying in the shade. Once it is dried pack it in gunny bags.

Surplus neem seeds will fetch you surplus buyers. If you sell neem seed powder instead you make 15 times the profit that you make from selling the seeds. Just make sure you make it known in your area that you have surplus neem seeds. Organic farmers are much in need of neem kernel but most of them do not know where to find a seller.

You can also register as a seller at Kissan Centres and Khadi Centers. It will help you network with many people who are interested to buy neem kernels.

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Shoury Reddy

Executive Director
SOPAR-BalaVikasa

It is a common trend to meet people having educational degrees in contrast with what they do for a living. Then there are people like Mr.Shoury Reddy who have been clear about what they want to do in life all along.

Mr.Shoury holds a Master's degree in Social Work and a Diploma in Social Development from Coady International Institute, St F X University, Canada.

He complemented his educational background with 25 years of working with grassroot communities and networking with multi-level stakeholders. Shoury worked for 2 years at SOPAR-BalaVikasa when it was founded in 1991. He has taken multiple roles in the organization before turning Executive Director in 2009.

It was a pleasure to have a discussion with him and understand his views on the topic model fruit farming in 5 acres with 100 varieties of fruit trees.

"I am from Warangal, Telangana. I am a community development professional at Bala Vikasa. We operate in more than 6000 villages covering Telangana, Andhra, Maharashtra, Chhattisgarh, Karnataka , Tamil Nadu.

Through our organization we promote lot of community development activities like women empowerment, farmers empowerment, agriculture, school education, clean drinking water. We have innovated lot of development projects which became models to governments, NGOs and corporates. In that way Bala Vikasa is recognised as a development innovator. We have impacted around 50 lac people through a variety of projects. We also have a training centre which is building the capacity of non-profits from 81 countries. So all the NGOs and government people , they come to Bala Vikasa to get trained by us in developmental approaches. We also have an international centre in Hyderabad which is training the corporate companies. We are one of the biggest social enterprise stat up incubator. I am the CEO of this organization I have been with Bala Vikasa for the last 30 years."

Why the name BalaVikasa. What are your core activites?

Bala Vikasa is an NGO founded by my aunt (dad's sister) named Bala who lives in Canada. This is a 42 year old organization that aims at community driven development organization.

We focus on building the community first and then build projects for communities. That includes creating awareness, creating interest, motivating them etc. I have been associated with it for the last 30 years. It is a family mission to serve the people.

We have a Bala Vikasa International centre across 20 acres. It is going to be India's biggest start up incubator. We have spent 30 crores to make an iconic building in a huge campus there. We will be conducting a series of capacity building and corporate CSR programs there. We want to reach out to many people based on our 4 decades of learnings and experience there. Its going to be the biggest private CSR institute and also the biggest enterprise start up incubator in the country.

What are you involved in currently?

Through Bala vikasa we promote organic farming in 32 villages which covers around 1500 farmers. While interacting with the farmers, they asked me if I had hands on experience in organic farming. That's when I decided that I too had to practise it myself before speaking about it.

There are quite a few reasons why I decided to get into it on my ancestral property. Though the concept of organic farming is a buzz word today, not many actually know about it. I decided that I not just want to convince and encourage farmers about organic farming, I wanted my children to know about agriculture too. I take them to the farms every week, so that they get to see and indulge in farming activities. I also wanted my family to be healthy by consuming organic food.

Many farmers doubt whether organic farming practices will really produce the required quantity and quality. I wanted to prove that with organic farming also we can produce equal or more quantities as compared to chemical farming.

I wanted many variety of plants on my farm. Upon a single visit you can see 100 different varieties of fruits. You get to see trees and its fruits which is not native to Telangana too, like Apple, Lychee, rambutan etc. on my farm.

I do a lot of native varieties as well so that I can share it with my neighbouring farmers and tell them that they can cultivate it as a commercial crop. After seeing my farm, few farmers have decided to grow Lakshman phal - a variety of Custard apple - on a commercial scale. This fruit has high anti-oxidant content and is also great to keep cancer at bay.

This way the farmers get adapted to new fruits. I was meticulous and deliberate in collecting different varieties of fruits. It's been close to 7 years since this has started and even today I keep focusing on bringing in variety.

Does your farm have a name?

I have named it Spurti after my daughter. Spurthi means inspiration. That is what I aim through my farm – to be an inspiration. As it is very impressive, many interviews and TV programs have been done on my farm.

We have more than 100 varieties of plants. We even have the Rudraksha tree, which usually only grows near the Himalayas. I grow more than 6 varieties of custard apple. Also on the farm are star fruit, dragon fruit, kumquat, coffee, apple bear, cactus, water apple, pineapple, tree cucumber, around 6-7 different varieties of tomatoes, sweet amala, orange, jackfruit, water apples, 16 varieties of mango, etc.

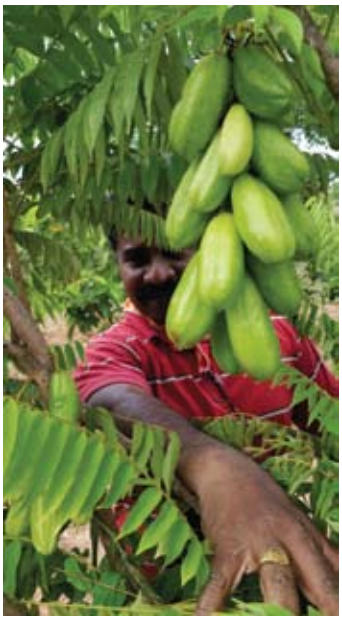
Though Warangal, Telangana weather is not suitable for apples I have it growing in my farm. I am trying to create a green fence. On my fence I am trying to grow different trees that grows 30-40 ft and creates the impression of a forest. I keep experimenting with plants that usually do not thrive in Warangal's climate.

Right from childhood I have been a person who thinks differently and does things differently. Probably that's why Bala Vikasa has become one of the leading non profit organizations in the country with lots of innovative projects. The government of Telengana has adopted 6 projects of mine. I always think differently or ahead of others. I am all for making positive changes.

Also, I want to create a model for people who can invest only around 2 lac per year. There are people who owns land around Chennai, Hyderabad, Bangalore etc. but not being used for any meaningful cultivation. They should have access to couple of vegetables and fruits and have a source of organic products.

Water is an issue in today's world. Will these varieties grow in areas that is deprived of surplus water?

Drip irrigation can be a solution for water issues. You might not be able to



grow 100 different varieties but you can surely have atleast 40-50 varieties.

What is the scope of help you can provide for farm owners interested in having a farm like yours?

I can invite them to my farm and give them a demo on how everything can be done. We can also have a conference online if they wish to collect some information from me.

How do u source your saplings?

I source them mainly from Bangalore. In Andhra Pradesh there is a nursery which is spread across 4000 acres. I source from there as well. I also source saplings from Pune, Patna etc. There are quite a few people who knows about my passion. So, when some special variety comes in they call me up and ask if I would be interested in sourcing it.

How good is grafting and are there specific varieties that are good for grafting?

I am not into grafting at all.

How do u plan your plant spacing, fertilizer etc.?

Initially I used to just plant everything in the same block. But I gradually learned that we have to plan and allocate blocks per season. For example, all summer plants can be planted together. This helps to irrigate, fertigate better and conveniently. Since the last 2 years, I have been allocating different blocks for summer crops and monsoon / winter crops.

In the last 7-8 years I have not spent a single rupee on buying chemical fertilizers or pesticide. Everything is made on the farm itself. I have 2 desi cows. So, I make garajeevamritham, darajeevamritham, panchagavya etc. on my farm itself. We have 20 different varieties of decoctions that help control all kinds of pests and diseases.

Have you faced any pest related problems?

Like any other farm, even my farm does have pests. But I have lot of decoctions like Brahmastra, jeevamritham etc that I make myself that takes care of all that.

How do you train the manpower in your farm?

I go to my farm every week with my family. We do not require heavy manpower or great training for growing these plants. If we just demonstrate/ train them once on how to prepare these decoctions and fertilizers, they will be able to do it themselves.

BalaVikasa has a team that trains farmers on organic practises. My farm is a very good model for many other farmers.

Do you have poly houses in your farm?

No, I do not have poly houses, but I am trying to experiment with the ultra high density method of farming. I tried it with mango. I want the mangoes to have more branches and low height so that harvesting is easy.

What is your message to people who would like to farm like you?

India worked a lot towards green revolution. We have used a lot of chemical fertilizers to increase production. It has caused a lot of damage to the environment and it is also endangering soil and human health. Let us not contribute to the mess.

Today, we need an evergreen revolution which is acheivable through organic farming. Invest money and effort on organic practises. Many people have the feeling that we cannot increase production by using organic methods. But I have proved otherwise. My farm production has been 10% more than my that of neighbouring chemical farmers. Organic farming is also labour intensive and requires investment.

What are your future plans?

My farm is my passion and stress reliever. It is my way of contributing to the society. But my main mission is community development. I do not wish to scale up, I do not want to put my hands in too many things and fail. Now I am able to inspire many people and wish to continue doing that.

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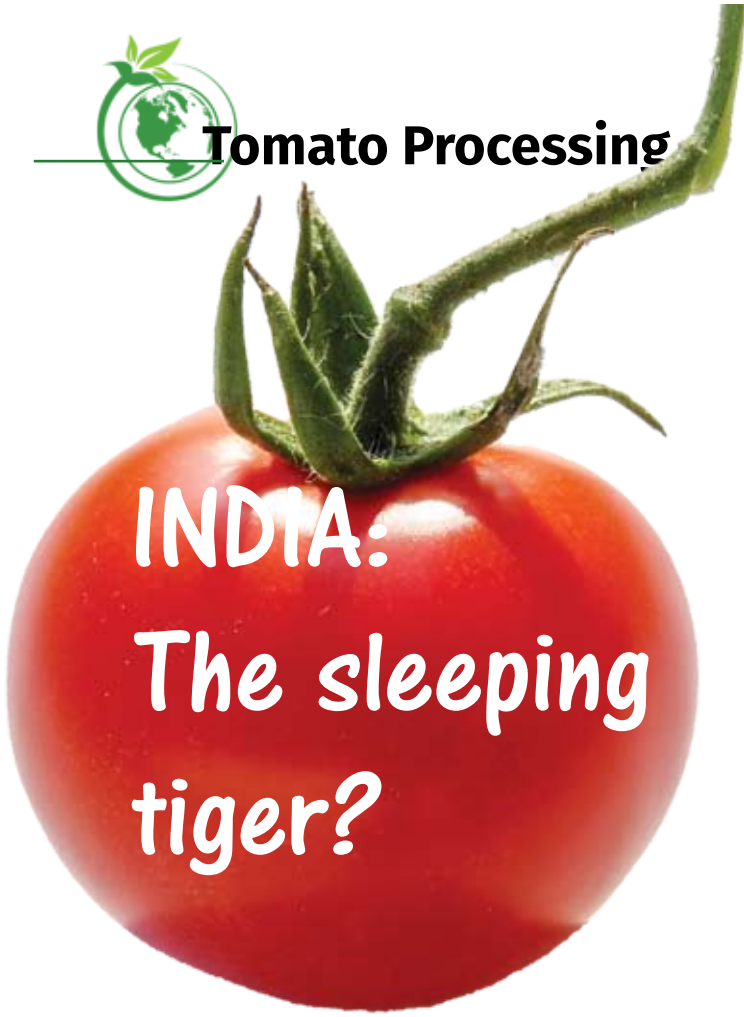

INDIA: The sleeping tiger?

India is the second largest country globally both in terms of population (1.38 billion inhabitants) and in terms of volume of tomatoes produced with more than 20 million tonnes in the fiscal year 2019-20. A well known Indian saying is "No tomato, no cooking" but 99% of the tomatoes are currently consumed fresh as it is currently estimated that only about 150,000 tonnes of tomatoes are processed annually. Is this about to change? Will India emerge in the next few years as a significant player in the tomato processing industry?

"India is one of the largest producers' of fresh tomatoes. However, India is primarily a fresh tomato consuming market. Processed tomato consumption is lesser. This market is advantageous in terms of the availability of raw materials for processing tomatoes. One of the key challenges is to be able to convert fresh tomato consumers to processed. Secondly, tomatoes being a cyclical fruit, the processing infrastructure is more suited for other fruits when compared to tomatoes, hence processors tend to focus processing seasonal fruits. We at Kagome India work with directly with the farmers and also with some of the FPOs in order to establish our 'farm-to-fork' linkage. Kagome India has been in the forefront of launching new product verticals in the Indian processed tomato sector with the "crushed tomatoes" being our flagship product, which is a recommended alternative to fresh tomatoes in the Indian and Italian cuisine due to its consistent quality and pricing."
Rohit Bhatla, Managing Director, Kagome Foods India (Excerpts of interview with Tomato News SAS)

TOMATOES IN INDIA

The Indian economy is predominantly dependent on the agriculture sector, which contributes about 17% to the total GDP, and tomato is one of the three most importants crop under the Indian government "TOP" priority list of horticultural crops alongwith Onions and Potatoes. These three TOP staples found across the country symbolizes the government of India's initiative called 'Operation Greens' to improve the living condition of farmers.

ln lndia, the tomato is mainly grown in two seasons across the country, which is from June to September (Kharif/monsoon season) and from October to February (Rabi/spring season), although in some regions, tomatoes are cultivated throughout the year. The Southern states comprising of Andhra Pradesh, Karnataka and Tamil Nadu as well as the Central states of Madhya Pradesh, Maharashtra, Gujarat and Bihar contribute maximum to the total tomato production in the country.

Though, lndia is the world's second largest producer of fresh tomatoes after China, it currently processes less than 1 % of its production, compared to a much higher proportion in other major producer countries. During the marketing year 2019-20, the production volume of processed tomato products rose significantly to reach an estimated 154,300 metric tonnes (MT) from 142.550 MT in 2018-19. Similarly, the average yield of fresh tomatoes in lndia has increased from 24.09 MT/ha in 2018 to 25.33 MT/ha in 2019-20 mainly owing to the availability of better inputs, seeds and sustainable farming techniques.

Due to its perishable nature, tomatoes cannot be preserved in their fresh state. Hence, these are processed in order to reduce their loss percentage. In India, huge post-harvest losses of the harvest-

"India is a consumption oriented economy. Tomatoes are mainly grown to meet the domestic demand. Many at times, when there is too much of abundance, crop prices rise. Being a "TOP-crop", with reference to the Government of India's top priority crops, tomatoes are subject to wide fluctuations in prices and often farmers face hardships with such fluctuations"

States	% Share of Annual Production in 2019-20
Andhra Pradesh	12
Gujarat	8
Karnataka	8
Tamil Nadu	7
Maharashtra	6
Bihar	5
Others	54
Total	**100**

Source: National Horticulture Board of India

Region	Transplanting	Harvesting
Southern & Western States	A- June-July	A- August-September
	B- October-November	B- December-February
	C- January-February	C- March-June
Northern & Eastern States	A- October-November	A- January-March
	B- January-February	B- March-June
Hilly States	A- May-June	A- July-September
	B- October-November	B- December-March

ed tomatoes occur due to inadequate storage facilities, which brings substantial loss to the growers and hence to the national economy. A governement report estimates that 12.4% of tomatoes are lost. The preservation of tomatoes in a semi-processing system not only takes care of the marketable surplus but also ensures the supply of raw materials for finished products like sauce, ketchup, drink and other processed products. Presently, there are no processing varieties that are commercially viable for use in India. In the absence a suitable processing variety, Indian processors tend to import bulk tomato paste mostly from China and simultaneously process fresh market tomato F1 hybrids during the glut period i.e., when the prices go below Rs.2 per kg.

TOMATO PRODUCTION

According to reports, tomato farmers sell their produce usually through a local aggregator or via a trader at the local or regional mandi (marketplace). Farmers realize an estimated 30-50% of total value through the supply chain with the remainder being distributed amongst a multiplicity of traders and commission agents.

This low margin on total value makes production unviable during the glut periods when tomato prices can fall to between Rs 0.50 to Rs 2 a kg. Few farmers are organized into production clusters through formal or informal structures like registered organizations or Farmer Producer Organizations (FPOs) reducing their access to contract farming options as well as their bargaining capacity with processors.

For instance, Sahyadri Farms, a leading FPO through its "Seed to Plate" approach plays an important role in tomato supply chain. Farmers and middlemen have a preference to sell to urban markets rather than to sell to-processors. As a result, several paste makers have indicated a slippage of 10-20% in production which farmers seek to sell on the open market when market rates are more attractive than the contracted rates. Production costs are currently estimated at between Rs 2 to 2.50 per kg on average (assuming yields of 50 tonnes/ha and operating expenses of between Rs 40,000 – Rs 45,000). As per reports, Processors seek tomato at or under Rs 4.50 per kg to maintain commercially viable operations, though some indicate a willingness to go beyond Rs 5 per kg, particularly during the off-season. Mandi prices typically range between Rs 6 to 10 per kg though they may skew to Rs 2 per kg in glut market conditions and Rs 40 during the off-season. The challenge is to establish a price arbitrage equilibrium that supports both the farmer and processor – this can best be achieved through improved crop yields coupled with reduced production costs by the farmer and effective as well as sustainable contract farming mechanisms offered by the processor. There is also a significant interstate trade in tomato driven largely by availability (varying harvest seasons and particularly off-season production), price variations and quality considerations.

"One of the main reasons as to why the Indian tomato processing industry is yet to successfully develop is because processors have not managed to obtain a reliable and consistent source for raw materials at the required cost and quality. Many at times, the real challenge for processors is when the contract price fails to match the farmer's expectations. These issues can be resolved through better contract enforcement and backward integration. Expected policies could include, promotion of mechanized harvesting, subsidizing transportation costs incurred while supplying tomatoes to processing units and fixing a minimum support price based on the actual cost of processed tomato cultivation."

Mandis and traders play a primary role in moving produce around through extensive trading networks. This in part helps create price equilibrium across regional markets but could also cause local shortfalls, a particular issue for the small processors who depend on local markets to secure raw tomato. On July 5, 2019, the Government of India announced a plan to promote 10,000 new farmer producer companies over the next five years.

PROCESSING TOMATOES-BREEDING EFFORTS BY PUBLIC INSTITUTIONS

Public institutions have been breeding varieties more suited for processing than the ones generally grown by farmers. The tomato variety Pusa Ruby (IARI, New Delhi) was one of the earli-

CATEGORY	2016A	2017A	2018A	2019A	2020E
Production Volume of Fresh Tomatoes (in 000'metric tonnes)	18735	20708	19007	20573	20310
Production Volume of Processed Tomatoes (in 000' metric tonnes)	141	155	143	154	152
Surface Planted (in 000' hectares)	774	797	789	812	785
Average Field Yield (in metric tonnes/ha)	24	26	24	25	26

est varieties used for both fresh market and the processing industry in India. Public bred processing varieties viz; Punjab Chhuhara (PAU, Ludhiana), Roma (NBPGR, New Delhi), Pusa Gaurav (IARI, New Delhi), Arka Ashish & Arka Ahuti (IIHR, Bengaluru) were adopted by farmers up to a limited extent. However, gradually commercial fresh market hybrids were being adopted by farmers due to their high yield potential.

Furthermore, ICAR-IIHR, Bengaluru has observed that there is ample scope to breed dual purpose tomatoes with processing quality attributes viz., high pigment genes (Ogc, hp) for deep red colour, joint less pedicel for mechanical harvesting, on plant storage of fruits, TSS, acidity, resistance to bacterial wilt, early blight, and begomo viruses with a minimum yield of 75-80 t/ha. In 2019, ICAR-IIHR, Bengaluru developed two high yielding F1 hybrids Arka Apeksha & Arka Vishesh suitable for processing with high yield potential (75-80 t/ha). Subsequently, both the hybrids were analyzed by four processors Sunsip Foods, Karnataka, Sahyadri Food processing, Maharashtra, Jadli Foods, Tamil NDU and Cremica Foods, Punjab. All the four processors reported that both Arka Apeksh and Arka Vishesh varieties could be suitable for processing.

PACKAGING & QUALITY PARAMETERS

Tomatoes are processed into bulk packaging for example, in an aseptic presterilized bag in barrel that has a 210-228kg capacity.

To cater to the needs of the retail consumer segment, processors pack tomato Ketchups, Pastes, Sauces, Powder and Canned Tomatoes in varied packaging ranging from 8 gram sachets to 2.5 kg Cans.

THE LEADING INDIAN TOMATO PROCESSING COMPANIES

Nestle India

Nestle is India's leading ketchup maker with a market share of 37% through its Maggi brand. Nestlé India collaborates with suppliers to source raw materials locally under its Supplier Development Program though it also uses its global supply chain to import raw material for ketchup production in India.

Hindustan Unilever

HUL's Kissan brand is India's second-most popular ketchup brand in India.HUL was one of the first processing firms to institutionalize farm-gate sourcing of tomatoes from smallholder farmers in Nasik district in 2011. Kissan partnered with smallholder farmers, a local tomato paste processor named Varun Agro and agri-input supply companies to establish a supply chain aimed at producing tomato paste locally that could be used as an input into its ketchup production process. Unilever sourced 40,000 tonnes of tomato from India in 2011, some 60% of its requirement for ketchup production. Working with growers it sought to mainstream sustainable agriculture practices including improving soil fertility, water management, and pest control.

Field Fresh Foods/Del Monte

India's third largest processed tomato products maker, Field Fresh manufactures ketchup, pasta and pizza sauce under the Del Monte brand at its factory in Krishnagiri District, Tamil Nadu.

Kagome Foods India

Japanese food maker Kagome Co. had begun commercial production and sales of processed tomato products in India, catering to hotel and restaurant demand. The company, which entered the country in 2013 in partnership with a local firm and terminated the joint venture in 2016, invested 500 million rupees ($7 million) in its own plant at Nashik in the western state of Maharashtra.

Read full article @ https://bit.ly/3qWLQjY

Source : http://www.tomatonews.com/

Processed Tomato Products in India- Pack sizes & type

Question

Q&A

Answer

01 INTERCROP FOR COCONUT TREES

nprabhs : Hi, We have a coconut farm with 1 year old and our area is dry during summer situated in westernghats belt. We are looking for intercrop like trees which also shouldnt harm our coconut trees. We thought of papaya trees, but white insect will harm our small coconut trees as well. So dropped papaya trees. Any other suggestions on this? Also we do like to try exotic fruit trees if possible. Please guide.

Answer 1 : garao56 : Generally arecanut trees are planted in coconut . Cocoa can be planted. Other crops like pine apple , zinger, tapioka, banana, Yam etc can be planted in the coconut orchards . In AP Citrus plants (lime) also planted .
G.Anandarao B.Sc(Ag)

Answer 2 : tomvia : You can plant banana for three years or any seasonal veggies or fruits as mentioned by Anandarao

Answer 3 : gounder28 : Hello nprabhs, Try Taiwan Pink Koya as udupayir between coconut trees. Yields in 6-8 months of plantation and produces through out the year. The buyer comes to your farm for harvest and pickup and they pay about Rs. 45-50/KG. The plant will yield to 6-7 years and NOT much maintenance require other than pruning often.

Answer 4 : shajathali: The first mistake you did was selection of crop. Coconut is a plant of high water area lie delta, river banks. You need to give 50 ltrs of water per day now and upto 80 ltrs in future. If you give less water, you wan grow only coconut trees not coconut. Just remove it, it is only one year old. Its my personal experience. When you don't have water to coconut itself, how you are planning for intercrop.

02 HYDROPONIC FARM SETUP

ashwithrs : Dear Friends, Would be really helpful to get practical guidance and help to setup commercial Hydroponic farm in 1 acre land.
Kindly reply with subject line"Hydroponics" for easy identification and follow-up.

Answer 1 : rgubbi : Hi, We do Hydroponic projects. contact us for more details

Answer 2 : garao56 : Please contact us for project report

03 NEED RECOMMENDATIONS FOR FARMING NEAR PUNGANUR,AP

gopipc: We are planning to go for scientific farming in Punganur (Andhra Pradesh). Climate is similar to Bangalore's climate. The intention is to support our orphanage expenses with the expected profit from farming. Any recommendations?

Answer 1 : stevifarm: Hi we have buy-back arrangements for stevia and medicinal plants. Contact me .

Answer 2 : vasudh: Good Morning Gopipc Jee ! I am suggesting you to go for Passion Fruit which is an easiest mean and having Good Market. As suggest on Brother Taiwan Guava is also better but the Market is up and Down and need to wait for the yield.

gopipc: Thanks for the suggestion. Do you have details on passion fruit including economics and buy back arrangements?

Answer 3 : vasudh: es Sir Considering the Nutrition and Easy Farming , it will have very Good Market.
One has to asses the Market based on the quality, usability, value for Money,
Health Benefits (Because the Future Market will be on Health Conscious in view of the Environment , attack of Bacteria, Virus etc... etc...
We can provide seedlings during June-August.
Kindly don't hesitate to contact us for any Further Details considering us as Farming Consultants

Answer 4 : garao56 ; Sri Gopic, First of all give particulars of land, location, irrigation facilities etc. In your opinion what crops are better for growing on the lands.

04 BEST QUALITY MORINGA BREED FOR HIGH YIELD OF INCOME

vpatel009: Dear team, I have 1.2 Acre farming land in Gujarat situated in Anand District and I am looking for plantation best quality moringa breed for high yield of income can you suggest me best breed and type of breed ?
Is there whole year moringa crop seeds in market for plantation?
Which kind of Pesticides needs to be use ?
Hoping your kind support and help!

Answer 1 : garao56 : Annual Moringa (drumstick) varieties PKM1 and PKM 2 are best for annual moringa cultivation , contact TNAU -Agricultural Research station , Periakulam , Tamilnadu for seeds .
Regarding pests hairy cater pillar is the main pest on drum stick - Use flame torch when the caterpillars settle on the tree trunk.

Please refer to us for further guidance

Answer 2 : vpatel009: Thanks a lot Sir for Valuable information and guidance,

madhukush : good Information. I am going to buy 2 acres land and planning drum stick. I will contact you if any help required. Location is Arakonam, Tamilanadu

garao56 : OK sir

05 NEED COUNSELING FOR SETTING UP FARM HOUSE IN JHUNJHUNU DISTRICT IN RAJASTHAN

ourfarm: Dear all, Thank you so much for having excellent platform to exchange valuable information. I am keen interested to establish a farm house in Jhunjhunu district of Rajasthan within my owned land of 20 acre. I am looking for subject expertise to provide me proper guidance for following; 1. Initial set up such as What type of Borewell I should consider to establish. 2. Sprinklers systems 3. Basic utilities/ facilities 4. Land segregation with designated type of crop, plantation.. 5. Regional or applicable vegetable and fruits farming 6. Small scale poultry, dairy and goats farmings Appreciate if someone can guide on subject inquiries. Together we can do better.. Thanks and best regards

Answer 1 : garao56: It seems you are planning for integrated farming such as cultivation of crops as well as animal husbandry activities. You can approach bank for a term loan for land development which includes sinking of bore well, overhead tank, pipelines, fencing, spriklers/drip system, bund formation/formation of roads /pack house , worker quarter etc.

After starting cultivation activity , you can apply for a term loan for construction of farm house (Continuous income must be there for repaying half yearly/yearly installments)

If plantation crops like ber, date palm or any other fruit crops , if more than 5.00 acre (say 5.50 acre or 5.25 acres) please go for National Horticultural Board subsidy (35% of the total project cost) . Please write to us for technical guidance or project reports if you are in need

Answer 2 : jaisekhar: Can you give your contact number, I will call you, I have experience in integrated farming we can plan for long term setup and I will give you good and proper plan for long term income along with daily income.

ourfarm: Dear Jaisekhar, Thanks for your message. can you contact me

06 ORGANIC CONTROL OF TURMERIC SHOOT BORER

infiniteg : Shoot borer of turmeric (Conogethes punctiferalis) - feed on pseudostem and also feed on the leaf very fast and folding the leaves

Sprayed neem oil - 3%, beauveria bassiana - 0.2%, metarhizum anisopole - 0.25% Followed by NSKE -5%

We are doing organic cultivation in poly house and we are not able to control it. Please help us in controlling this

Answer 1 : gunda: If you need we can provide you the remedy.

07 VERMICOMPOSTING

jayesh123: I need guidance to start a vermicompost unit at Hyderabad. Would highly appreciate all suggestions as to how to start, manage, materials needed and sourcing. Gentleman with Knowledge in vermicomposting are requested to share their experience.

hrushi123: I need guidance to start a vermicompost unit at Washim, Maharashtra.

Answer 1 : vrikshaay: We can provide complete consultancy for setting up vermicompost and other methods of organic composting systems to convert all kind of residues (we normally say, wastes) to valuable manure. Please contact us with your requirement details and details of available residues (crop residues, food residues, non-veg residues-meat, chicken etc from slaughter houses, fish residues etc) and any other residues including leaf litter, so-called weed plants around (they are not actually weeds-they have a function and use designed by Mother Nature, which many failed to understand-so call them weeds and kill them!)

08 NEED SUGGESTIONS TEAK OR SANDAL PLANTATION

sanshitha:Hi, We have 1.5 acer land in Kaleshwaram, So we are planning to teak or sandal or etc plantation. Please provide good suggestions. If I go with teak. how many types are available?

And good teak ? and future demand?

Answer 1 : haradatta: Blindly you can go with agar wood plantations

Answer 2 : garao56 : Dear sri Sanshitha, Under wild conditions teak and sandal wood produce timber and heart wood in 40 to 50 years. Under irrigated conditions also sandal wood take 25 - 30 years for getting 25 Kg heart wood . Teak also take 25-30 years for getting good timber quality. Please go for any fruit crops like custard apple, mango, sweet orange, lime or taiwan gua in 1.50 acres and in the inter space go for sandal wood with drip system. On the border take up teak plantation. Suppose you take Taiwan gua you will get Rs. 1.5 Lakhs income from second year onwards and continue till 15 to 20 years . After 25-30 Years you can cut the sandal wood and teak and get considerable income. Please think of. If heart wood is not formed properly income will be a

Question Q&A Answer

few thousands only if harvested before 25 -30 years. Similarly , lime or sweet orange can also be planted as supporting plants to sandal wood trees. Thus please plan for continuous income on the land

Answer 3 : minalahm: You can contact me sir,

Answer 4 : garao56: The growth of sandal wood is excellent if Sesbania is planted as host plant

Answer 5 : rmashetty: It depends on your priority. Can you wait without yearly income? Do you want to hold for 25 years or 10 years?
We have done the following. On the border, we put Teak. There are two broad types of Teak. We put Tissue Culture teak but some have put regular teak.
In the middle, we partitioned land into three portions. First portion has Sandal + Custard Apple. Second portion has Sandal + Casuarina. I am yet to plant in section 3.
My objective was to bring diversity and reduce pest risk into farming.
I have had bad experience with Taiwan Jama, which is pro to lot of diseases. If I were you, I wouldn't go.
Please feel free to call me if you like to get more information.

Answer 6 : vasudh: Kindly Don't go for Sandal/ Red Sandal / Agar Wood . If any body needs reasons for my suggestion. Please Contact

Answer 7 : muraly menon : Excellent idea. In between all the plants and trees, turmeric and / or ginger can be planted for quick income. To get good profit, kindly avoid chemicals (pesticides and fertilisers).

Answer 8 : garao56 : Please take up sandal wood for huge amount of income

Answer 9 : vasudh : Thank you all we are suggesting you to go far any Forest Plantation "*Except SANDAL WOOD & RED SANDAL*" For short Duration Harvesting at any time between 4 Yrs to 10 Years. Remaining all the other Plantations requires a minimum of 20 YEARS. If any body needs a detailed Report we will provide

Answer 10 : garao56: For 4 to 10 years growth period farmers are taking up cultivation of casurina, Eucalyptus and subabul etc , but there is no demand from paper mills and also for fire wood. Farmers are suffering losses at present.

Answer 11 : garao56: Mr Sanshitha, please take up sandal wood with a mix fruit crops such as sweet orange , guava or custard apple so that you will be able to get continuous income till the sandal wood is harvested . Besides fruit plants , plant sesbania (Avisa) plants for better host plant support.

Q09 MEDICINAL PLANT CULTIVATION

rajmohana : I have 10 acres of agriculture land in Thanjavur Delta region. Good fertile clay soil, presently cultivating paddy. Please guide in alternative cultivation like medicinal plants.

Answer 1: garao56: Please inform whether your land is free from water logging condition ie., wet land . Medicinal plants thrive well under dryland conditions . Please have tie up with any herbal processing companies before taking up cultivation of medicinal plants.

Answer 2 : noahpatt: Thanks, that is exactly what I wanted to know.

Q10 NEW PLANTATION AND IT'S RETURNS

himanshu2: Hi, I'm planning to buy 5acre near Tumkuru, Bangalore region. Interested in plantation of teak, sandalwood, silver Oak, tulsi and plants like Melia dubey.
If anyone can share how things work up, it's maintenance and returns on the same. If any project report available will be appreciated.

Answer 1 : garao56: Dear Sri Himamshu2, please take up forestry/agro forestry trees depending up on your waiting period for expected income.
Type of plantation No of years Remarks
1. Teak 25 - 30 (wild condition 40 Years) Fetch good income
2. Sandal wood 20 -25 yrs (wild 40 years) It is a parasite depends on 100 types of plants under wild conditions (You can take Guava, Citrus, Mango, Custard apple ,Apple ber etc in between grow sandal wood as inter crop for continuous income
3. Malaia Dubia 6 - 10 Years If more than 5 years the yield will increase over time to get income
4. Silver Oak 6 - 10 Years For economic yield
5. Tulasi Annual /perennial crop In the forestry can be taken up as intercrop
Please contact us for further details and technical aspect and project reports for availing Bank loan

pullarao59: Sandal wood plus mango can possible in 6 acres red soil in AP? Please advise

Answer 2 : garao56: sandal wood and Citrus (sweet orange or lime) is better .

Answer 3 : minalahm: You can contact me sir,

Answer 4 : garao56: Please take up sandal wood with any fruit plant which will survive on 100 types of plants under wild conditons

Q11 FARMING IN RESIDENTIAL PLOT

eswarj: Sir, I have about 4500 sqft plot (earstwhile paddy field) in South Chennai. Appreciate any ideas to cultivate any short time yielding fruits, herbs etc.

Answer 1: steviasugar: Hi Tulsi should be good contact me

Answer 2 : stevifarm: We can help you out please contact

Answer 3 : garao56: It is nearly 10 cents of land, you can take up Taiwan guava, apple ber you will get income from second year on wards.

Q12 PLANNING TO START ALOEVERA CULTIVATION IN ANDHRA PRADESH

agrnaveen: Hii, I am an Agri Grad currently working as Quality Manager in a Agritech company. I am planning to start Aloevera cultivation in Andhra Pradesh, we acquired lands in Srikakulam and Rajahmundry currently planning for trail cultivation in 20 acers if successful we will increase scale to thousands of Acers. Currently we are conducting soil tests and want to acquire market details and planting material.

Answer 1 : garao56: Please inquire with nurseries at Kadiyam for planting material. If aloevera is produced on large quantities marketing arrangements may be explored. Or start your own juice manufacturing unit and market it as the juice is highly beneficial for health.

Answer 2 : goliya: Please contact me

Answer 3 : stevifarm: It would be advisable to go for multiple medicinal crops rather than going for single crop. Contact us for further assistance on buy back arrangements for medicinal crops.

Answer 4 : garao56: Marketing arrangements for alovera may be explored

Answer 5: prabhupkk: Your contact details sir, I'm also interested to start medicinal crops, I have 14acres land with boewell-1no.

Q13 HYDROPONICS

agrihydro: Hi everyone, I would to like to know is hydroponics organic? I am looking for starting an organic farm.

Answer 1 : garao56: Currently hydroponic cultivation is gaining popularity all over the world because of efficient resources management and quality food production. Soil based agriculture is now facing various challenges such as urbanization, natural disaster, climate change, indiscriminate use of chemicals and pesticides which is depleting the land fertility. In this article various hydroponic structures viz. wick, ebb and flow, drip, deep water culture and Nutrient Film Technique (NFT) system; their operations; benefits and limitations; performance of different crops like tomato, cucumber, pepper and leafy greens and water conservation by this technique have been discussed. Several benefits of this technique are less growing time of crops than conventional growing; round the year production; minimal disease and pest incidence and weeding, spraying, watering etc can be eliminated.

Answer 2 : pramila m r: We are purchasing 1.13 acres of land near Nanjangud,Karnataka. So need details for undertaking hydroponic cultivation, and what would be the approximate cost to do it in 1 acre

Answer 3 : garao56: Initial investment for Hydroponic cultivation is higher and only some crops like tomato, cucumber and green leafy vegetables can be cultivated. Commercially farmers have not yet started hydroponics. Instead you can go for shade net or poly houses in one acre, flowers, vegetables like capsicum, cucumber , tomato etc can be cultivated . Moreover 50% subsidy is available for from state Government for construction of poly house or shade net house. Please think over.

Answer 4 : vishnu_: Investment for hydroponic cultivation is higher and only some crops like tomato, cucumber and green leafy vegetables can be cultivated. Commercially farmers have not yet started hydroponics. Also farming experience labour also required such kind of agriculture development purposes.

Q14 NEED GUIDANCE TO START-UP ORGANIC FARMING

dec123: Dear Sir/Madam, We are interested in organic farming in Goa, Please kindly let us know if there is any facilities given by the Goa government for purchasing of land also would like to know your suggestion in which farming we should go as per Goan climate or any other suggestions from your side for any type of farming which should be appreciable and profitable.

Answer 1 : garao56: It seems Government is not giving any assistance for purchasing land in India but term loan for land purchase is available from commercial banks depending up on the position of the farmer ie. MF or SF (holding less than 11 acres) . The cost of land will be taken based on the average 3 years registration value in the Sub-Registrar's office . about 15-25 % margin has to be provided by the farmer .

Answer 2 : agrifriend: HI WE ARE ORGANIC AGRI INPUTS SUPPLIERS FROM ANDHRA PRADESH ITS HELPS FOR ALL THE CROPS ALL THE CLAIMATE AND ALL THE SOILS ITS 100% ORGANIC INPUTS. AGRIFRIEND

Answer 3 : vrikshaay : We provide complete advisory services farming with multi crops including all type of crops suitable according to location of land and related factors. Please send request for details along with your land details
You can purchase farm land if you are eligible to purchase farm land as per State Government laws/rules of the State and some banks provide Land/Homestead Purchase loans on proof of your capacity to repay such as salary income or business income, and not based on repayment from farming income.

FARM LAWS

What India can learn from Kenya's agri experiment

Recent research at the London School of Economics examines a decade of high-quality farmer-buyer data from Kenya during a period when it introduced radical farm laws to encourage agri-businesses to determine impacts on small farmers

In the debate on new farm laws, emotions are running high with concerns that small farmers are being pitted against large agri-businesses. The new laws contain mostly untried policies and it is difficult to gauge what might happen when they are implemented. Surprisingly, little of the discussion has drawn on lessons learned from countries that have implemented large-scale policies to encourage agri-businesses.

Since the advent of market-oriented policies in the 1980s and 1990s, many governments in developing economies moved away from controlling agricultural markets to encouraging participation by private-sector firms. Hard evidence on how these policies have impacted farmers has proven difficult or come from very limited experiments, because of a lack of data on farmer-buyer relationships and the complexity of quantifying the many clauses that go into farm policies.

Recent research at the London School of Economics (LSE) overcomes these hurdles by examining a decade of high-quality farmer-buyer data from Kenya during a period when it introduced radical farm laws to encourage agri-businesses. Much in the same way as India is doing now, the Kenyan government introduced these laws with the expectation that the rise of such businesses would transform smallholder agriculture for the better. Over 20 pieces of legislation were repealed to encourage agri-business participation in crop markets that made up over 70% of small farm incomes.

It had its expected impact on the rise of agri-businesses. Their overall market share as buyers of farm produce almost doubled, reaching 38% by 2010. But within the crops that were "liberalised", the story was not as straightforward. Soon after the policy was implemented, small farmers became more likely to sell these crops to agri-businesses, especially in areas that were more reliant on these crops due to agro-ecological conditions. But, five years on, many had stopped selling to these businesses.

Farm incomes from these crops had fallen. Farmers who were reliant on agri-businesses saw their incomes fall by an average 6%. They sold household assets to maintain their day-to-day consumption.

What went wrong in Kenya is what farmers in India fear. Kenyan farmers expected to see productivity gains from selling to agri-businesses, which initially gained market share at the expense of other buyers. The ease of doing business increased in buying and marketing. As agri-businesses moved into these new activities, greater investment outlays and hence greater profitability was needed to finance them.

Farmers began facing bigger agri-businesses which, on average, saw their profit margins rise by 5%. While some farmers were able to leave their agri-business relationships, many were facing bigger and fewer buyers in crop markets.

The Kenyan experience illustrates what can go wrong with large-scale untried policies and what provisions need to be in place to avoid hardship. In its revised agricultural strategy in 2010, Kenyan policymakers reflected on how small farmers can suffer when ease of doing business is prioritised in markets where there is "no critical mass and enough capacity for the private sector to grow". India must heed this lesson before implementing its farm policy. Of course, this is not to say India will have the same experience. We are certainly in a better economic position in terms of per capita income, about a third higher than Kenya. But there are many common problems in smallholder agriculture, such as low productivity, investments and market access, which keep farm incomes low across India.

Kenya, if anything, was better placed than many in terms of political will and an infrastructure for poverty alleviation. India has often looked to Kenya for its innovative poverty solutions, such as online payment systems. Lessons can be applied in the current context too. A top-down policy, uninformed by bottom-up realities, is unlikely to transform the livelihoods of small farmers.

Swati Dhingra is an associate professor at LSE. The article draws on 'The Rise of Agribusinesses', co-authored with Silvana Tenreyro, supported by the European Research Council

The views expressed are personal

Source : www.hindustantimes.com

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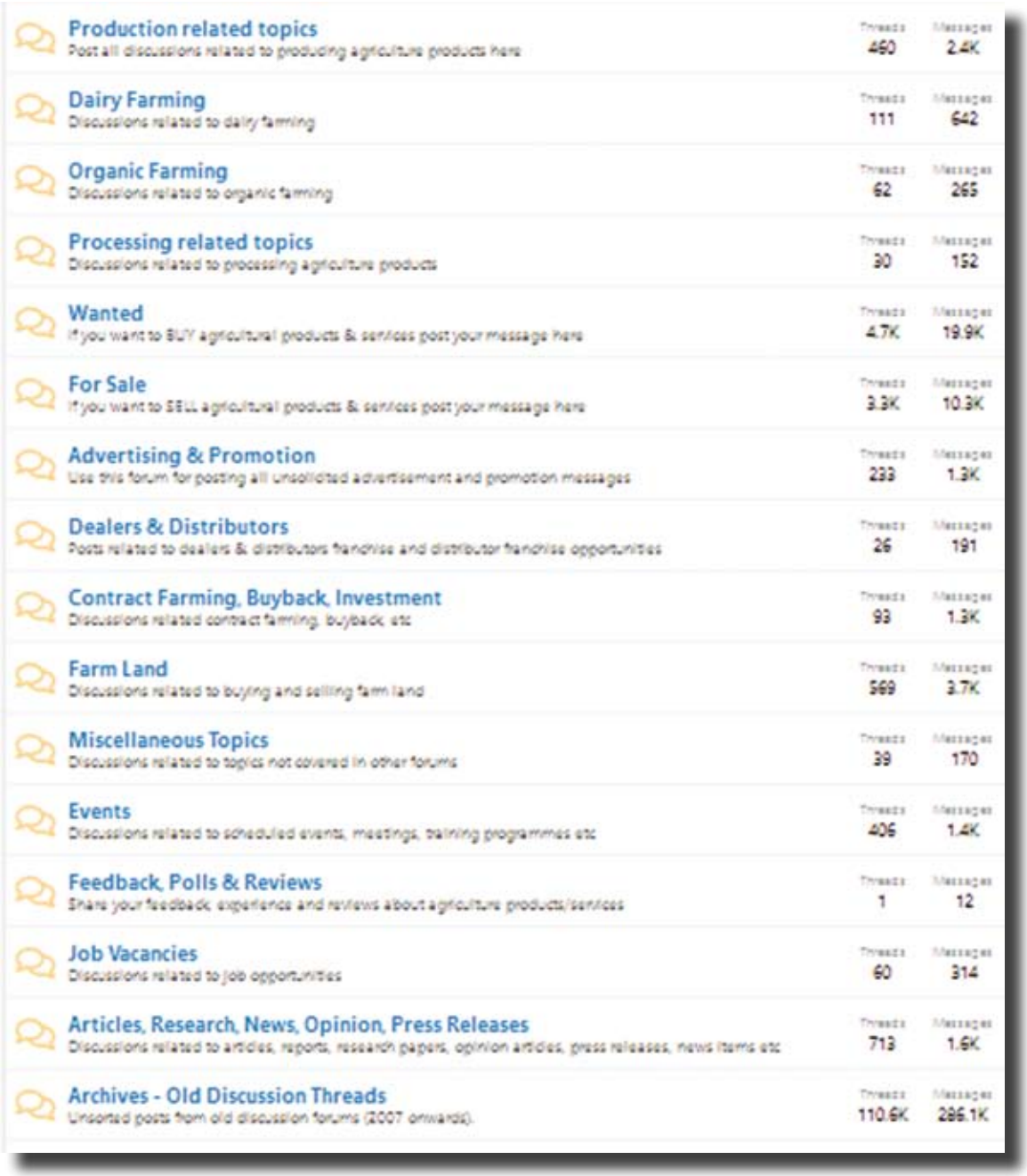

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Production related topics Post all discussions related to producing agriculture products here	460	2.4K
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Organic Farming Discussions related to organic farming	62	265
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Articles, Research, News, Opinion, Press Releases Discussions related to articles, reports, research papers, opinion articles, press releases, news items etc	713	1.6K
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