

CLIMATE SMART TECH EASES FARM WOES FOR FATHER & SON



Kaushik and dad, Atish work on their farm

‘Mauda Greens’ in Buabua, Lauto-ka is the first farm utilizing 100 per cent renewable energy to power its business, thanks to the innovative and brilliant thinking of the agricul-ture entrepreneur’s son.

Not only is the farm fully pow-ered by nine solar panels on a mo-bile machine that is easily moved from point A to point B, but the solar-powered system also ener-gises their home.

Atish Chand, 47, and his son, Kaushik, 22, are the ultimate fa-ther-and-son combination, working seamlessly together to success-fully blend modern technology and farm work, thus immediately re-solving issues of fuel costs, steal-ing, and water supply for their veg-etables.

Having the most climate smart farm in the Western Division did not

happen overnight. Rather it was the experience of a young Kaushik watching his father, Atish struggle in farming that sowed the seed of determination that blossomed to a brilliant and customized, modern, solar energy-powered farm; that most likely will become a model for climate smart and engineered farm in the Western Division, or even Fiji, if it is not already.

For Atish, farming was some-thing he ventured into after leaving work to take it up full time. Start-ing off was not easy. All this was carefully observed by Kaushik. His father’s struggles to put him into school until he graduated with an electrical and electrical engi-neering diploma, allowed him the space to become creative with his interest.

Today, when one takes a walk

around their family farm, one is able to instantly pick out the smart-ly-engineered technology Kaushik built amongst the fruit trees and vegetables in the form of at least two different types of irrigation sys-tems; sprinklers and flood. These are of course powered by water pumps via solar energy, of which water is drawn from a nearby creek that runs by their land.

While Kaushik was undertak-ing studies, Atish was assisted by the Ministry of Agriculture to start off his fruit tree orchard with 50 guava trees, which he diligently worked on. He did so well that he was assisted with another 50 of the same fruit trees. From these 100 fruit trees, Atish invested an addi-tional 100, then another 200, which he planted on a separate one acre of land.

“For this one acre of land, we spent \$10,000.00 that included planting materials, land prepara-tory activities, and a drip irrigation system. I am very grateful to Tai-wan Technical Mission (TTM) for their technical advice that led to successful guava productions” At-ish said.

“When I started farming, I was alone at first. Then I employed one labourer. Today, I have eight labourers. All from farming,” he added.

“I want to thank the Ministry of Agriculture for this orchard pro-gram. I want to thank the Ministry for assisting farmers who have

shown their potential in farming. My fruit orchard was given by the Minister and I want to thank him for it. From that orchard we have really benefited and invested more into it,” Atish added.

Atish is now also planting drag-on fruit, through the assistance again of the Ministry and he looks forward to this particular experi-ence as it is his first time to try it out.

Kaushik’s interest in technol-ogy fueled by his passion to help farmers in reducing costs, knew no bounds and when he watched a video on how solar energy pow-ered a house, he instantly nurtured the idea that the same technology could also power a farm.

A lot of reading, researching; a lot of trial and error; coupled with his ‘natural gift’ and intelligence – saw him four months later build his first lot of creations on the family farm – solar panels with its accom-panying gadgets to power both the farm and their home, CCTV cam-eras, irrigation systems, and he even re-made a drone; where he took it all apart, made adjustments of his own before putting it togeth-er again - all now fully operational. These all occurred a year ago.

Now Kaushik has progressed further, with the 22-year-old reg-istering his business – ‘Resolu-tion Technologies’ the purpose of which is to marry agriculture and modern electrical engineering to save costs for farmers to ensure

peace of mind.

“My products have a five-year warranty period. That is how con-fident I am in my products. But I am not doing this for the money. I want to help farmers because I know the problems that come with farming.

“My products for solar energy are customized for each farmer, which means I have to physically visit the farms, no matter where it’s located, so I can understand the issues the farmer is facing and tailor the products to suit his farm. I also throw in a free one-day training to teach them how the products work.

“I can also design their irri-gation systems, as long as they have a water source, everything else after that is customized for that farmer,” Kaushik explained.

Proud dad, Atish said Kaushik was very good at identifying solu-tions to problems on the farm.

“He (Kaushik) knew we had a problem with water for the farm, so he made the irrigation sys-tems. We had a problem with high electricity costs of around \$400 weekly. Kaushik created solar panels for our solar energy so we now have free electricity on the farm and home which is free. We had problems with people steal-ing vegetables on the farm, so Kaushik made CCTV cameras and we can watch the farm from the comfort of our home,” Atish explained.

PLANTING GUAVA FOR CASH



Under the Orchard Development Program of the Ministry of Agricul-ture, 27 Guava, 16 Dragon Fruit, 5 Avocado, and 1 Breadfruit Orchard have been established since 2019. Another 50 orchards will be estab-lished during the 2021/2022 Finan-cial Year. The program aims to es-tablish fruit tree orchards across the country with commodities such as Breadfruit, Mango, Banana, Guava, Dragon Fruit, Avocado and Drinking coconuts (Bu).

The Ministry of Agriculture in collaboration with Taiwan Technical Mission introduced a new variety of Guava from Taiwan in 2007. This variety has been under research for 10 years and was recommended for commercial cultivation in Fiji in 2017. Currently, Fiji produces 50 tonnes of Green Pearl guava annually, from zero production two years ago.

**Variety**  
Green Pearl

**Climate**  
Guava can grow in a wide range of environmental conditions, however,it produce well under the following conditions:

- **Altitude:** In the tropics guava produces well on altitude ranges from sea level to 1000m.
  - **Temperature:** Guava can grow within 15-45°C, however, optimum production at average annual temperatures between 23-28 °C.
  - **Rainfall:** Annual rainfall ranges from 1000 to 2000 mm. For optimal production, rainfall should be evenly distributed over the year.
  - **Drought:** Guava is among the most drought resistant tropical fruit crops. However, water is critical for commercial production.
- Soil Requirement**
- Guava is hardy crop which is adaptable to a wide range of soil type.
  - It thrives best on well-drained clay loam to sandy loam soil rich in organic matter
  - Soil pH: ranging from 5.0 to 7.0 is recommended for commercial production.
  - It withstands acidic soils and also tolerant to shade.
- Site Selection & Land Preparation**
- Select clear site under full sunlight and near to reliable water source.
  - Two ploughings alternated with two harrowings are recommended or good soil tilth.
  - Poultry manure: 10 tonnes/ha is broadcasted two weeks prior to planting.
  - Rotovate the ploughed land plus manure, to ensure that manure is well incorporated into the soil.
- Spacing**
- 4m between rows and 4m between plants within the row.
- Planting**

- Commercial Guava cultivation is propagated through grafting.
  - Grafted plants are ready for planting in 3 months after grafting.
  - The best time to plant is at the onset or during the rainy season.
  - Mark the planting spots with pegs the based on the spacing.
  - Dig the hole at 40cm deep and 40cm wide (knee height).
  - Apply basal fertilizer and thoroughly mix with the soil.
  - Carefully remove the potting bags, ensure that roots are not disturbed.
  - Carefully place guava seedling in the hole then cover it with fine soil to the base of the seedlings.
  - Water the seedlings right away if soil moisture is not sufficient.
- Pruning**
- Pruning is a must in guava production.
  - Within the first 3 to 4 months after field planting pruning and training is vital to increase yield. Non-pruned tree enhances vegetative growth resulting in late flowering.
  - Structural pruning is done to maintain the tree at desirable height and shape.
  - Eliminated root sprouts, low-lying branches, disease infected and other dead branches.
- Fruit Bagging**
- Prune (remove) excess fruits on the branch.
  - Bag the fruit at fruit set stage (size of a ping-pong ball).
  - Recommend to leave one (1) fruit on one (1) branch.
- Water requirement**
- Water is critical throughout the production cycle from flowering to harvesting.
  - Plants should be watered/irrigated

- as and when required.
  - Irrigation must be included in any commercial guava orchard.
- Fertilizer**
- Poultry manure: 10 tonnes/ha is broadcasted two weeks prior to planting.
  - Rotovate the land to ensure
  - Basal: Complete fertilizer such as NPK 15:15:15 or 16:16:16 at 50 grams per plant.
  - Side dress: Complete fertilizer
- | Age of Tree (Year) | Rate/tree/year |
|--------------------|----------------|
| 1                  | 400g           |
| 2 and beyond       | 800g           |
- such as NPK 13:13:21 based on the following:
  - Apply complete fertilizer at two months interval using the table.
  - Bury the fertilizer to enhance fertilizer-use efficiency.
- Weed control**
- Hand weed or use hoe for small plots.
  - Practice mulching to control weeds and retain soil moisture.
  - Avoid use of chemical herbicide.
- Pest Management**
- Generally, pests are controlled by practicing Integrated Pest Management
  - (IPM) including fruit bagging and field sanitation.
  - Important guava pests include the following:
  - White fly and Mealy bug
- Control:** Prune lower branches for more aeration.
- Spray with Sevin at 27 grams in 15 litres of water or Methate at the rate of 15 mls in 15 litres of water.
- Guava leaf and shoot webber
- Control:** Spray with Sevin 27 grams in 15litres of water.

- Thrips palmi
- Control:** Spray with Bifentherin at the rate of 2.5 mls per litre of water
- Fruit Fly (*Bactrocera passiflorae*)
- Control:** Bagging of fruits and avoid leaving overripe fruits on the field.
- Proper disposal of fallen fruits by burying.
- Bag fruits to avoid physical and insect damage.
- Disease Management**
- Colletotrichum gloeosporioides (Fruit Rot)
- Control:** practice good field sanitation.
- Harvesting**
- Harvesting starts in 6 to 8 months after transplanting.
  - Pearl Guava fruits all year round and matures in 70-90 days after flowering.
  - Fruit are carefully handpicked and placed in clean crates and boxes.
  - Fruits can be harvested weekly for more than 15 years.
- Post Harvest**
- Guava fruit is highly perishable.
  - It should be handled carefully during harvest and transportation.
  - Shelf-life of matured guava fruits can be extended to 20 days when stored in cool temperature of 5°C and 75-85% relative humidity.ets, hotels and municipals.
- Yield**
- 20 - 25 tonnes/ha/year
  - Average fruit weight: 400 – 500 grams/fruit
  - A well-managed tree produces 12 fruits per month
- Market**
- Currently, pearl guava has created massive demand locally in Supermarkets, hotels and municipals.