

AGRICULTURE WORLD

VOLUME 7 ISSUE 04 APRIL 2021 ₹ 100

the pulse of global agriculture

Unearthing Tubers for Hope

TRIBALS AND TUBERS

Purple Yam, an Excellent Source
of Antioxidants and Nutrients



Abhishek Kumar, Ashisa Kumar Rath & Manish Pandey
PRADAAN

In the current scenario, the whole food system is transforming towards more nutrition-based or immune system boosting foods, which must be rich in vitamin and minerals. Traditionally when we talk basic food system for human, we usually think around four basic food groups. In the context of Godda district of Jharkhand, the Tribal (Santhals) population is nearly 70% in a few blocks in which PRADAN works.

The food consumption score is extremely low in the region, the diet is largely cereal based with negligible consumption of vegetables. Some of the study says, the ancient tribal food system includes varieties of forest foods like green leafy vegetables from various plants, varieties of mushrooms and tubers. Gradually, the food system has been pushed from traditional cereals, pulses, mushrooms, tubers to only rice in their food plates.

With a perspective of restoring the traditional food system along with substantial cash income in hand, PRADAN have started introducing varieties of vegetable cultivation in large pockets. PRADAN's approach of "nutrition sensitive agriculture" encompasses the cultivation of cereals, pulses, oil seeds and vegetables to a maximum extent. Along with this, we also are focusing the scientific way of producing mushrooms and tubers with an objective of restoration of traditional food system and to make these commodities marketable by ensuring a sizeable production in a particular geography.

Tuber crops are considered as one of a most traditional food and it contains substantial amount of starch, fibre, vitamins, and minerals to make sure a complete food for human digestive system. This article is an attempt to explain the experience of the re-introduction of "Tuber crop cultivation" with multi-fold perspective, including strengthening the food system of the Tribal of Boarijore Block of Godda district.

Why Elephant Foot Yam (EFY):

Elephant Foot Yam is a traditional crop which is grown in Santhal Pargana area by the tribal communities. A few families in a village would have a couple of plants in their backyards for consumption purpose. With the demand from the market especially in Bengal and Bihar, PRADAN team in Godda saw this as an opportunity to scale it up into a commercial activity for higher incomes as well as household consumption to improve the nutritional status.

The reason behind large-scale adoption of EFY crop among Farmers:

- The crop can be cultivated even in uplands, waste lands apart from homestead land
- This crop requires minimal irrigation which is the problem for most of other crops and the crop is free from all kind of animal or cattle attack (grazing).
- It can be adopted in multi-layers farming system. Farmers can grow crops like maize, pulses and creepers as EFY remains an

underground crop. Growing creepers in trellis is very effective as the shadow of creeper provides EFY a suitable environment for its growth.

- Yield or production could be of 10–15 times of its seed weight after period of 210 days which helps the farmers to realize more profit.
- EFY has a very demand in the market as it is consumed in various ways such as curries, pickles, oal-bharta, chutney, sweets & other processed food
- The crop can be stored for long and thus farmers can use the crop for consumption and also sell it when the market rates are good.

Nutritional and Medicinal properties of EFY:

The tuber EFY (in form of corm) are rich in antioxidants and micro-minerals like zinc, potassium, magnesium, and sodium. The micro-minerals are extremely useful for the human diet as it stimulates the immune system directly and helps in metabolism to a great extent.

When we talk about nutrition, along with basic food groups like carbohydrate, protein, and fat, we also focus on vitamins and minerals. There are segregations found among minerals, like water soluble minerals, fat soluble minerals, trace minerals, and micro minerals.



100 grams of EFY contains;

| | |
|----------------|--------------|
| Calories: | 118 calories |
| Moisture: | 66 grams |
| Carbohydrates: | 25 grams |
| Fat: | 1.5 grams |
| Protein: | 9.81 grams |
| Dietary fiber: | 5.7 grams |
| Potassium: | 1208 mg |
| Calcium: | 20 mg |
| Iron: | 1.8 mg |
| Magnesium: | 82 mg |
| Sodium: | 14.2 mg |
| ZinTc | 2 mg |
| Copper: | 0.3 mg |



EFY has significant health benefit. It is rich in antioxidants to boost immune system and has high fibre content, it can help lower cholesterol, better regulate blood sugar levels. It is also rich in potassium and helps contain blood pressure. Studies show that consumption of EFY helps control hormonal balance in the body.

(Source: healthyday.net/elephant-foot-yam-health-benefits-and-nutrition-facts/)

PRADAN has trained local youth as Agriculture Entrepreneurs (AE). These AEs are imparted capacity building trainings around crop production, disease and pest control, agro-economics and marketing. These entrepreneurs support the farmers in providing technical know-how and input and marketing services to the community. The intervention was initially piloted in 2018 with 15 farmers with the support

Crop Cultivation Mechanism: A Scientific approach

| Particulars | Details |
|----------------------|---|
| Locally known | Aul, Jimikand, Suran |
| Varieties | Gajendra |
| Duration | 200 to 215 days |
| Soil | Soil ranges from loam to sandy and should be light and shallow. |
| Preparation of land | Prepare the land with two or three times of ploughing. |
| Time of sowing | Mid-February to early May |
| Seed | The corms are to be used as seeds for growing the crop in field which needs to be cut into pieces of 250 to 500 gm weight. |
| Spacing and pit size | (1'x1'x1') pit at distance of (3' x 3') on both the sides. |
| Treatment | It is treated with a bactericide (streptocycline). However, the other method also been adopted in which seeds are fully germinated before placing it into the pit by putting a thin cow-dung solution layer on corm and keep it under another thick layer of soil or sand for 15 to 20 days. This method is beneficial as it allows us to sort out the ungerminated pieces. |
| Manure & fertilizer | Organic manure (<i>around 1 Kg per pit</i>) or dry leaves needs to be put into the pit for better result. Fertilizer (DAP & potas) could apply after first weeding. |
| Irrigation | Irrigation required only for germination period which is also fulfil by rain. The land should be well drained particularly rainy season. |
| Interculture | Weeding should be done after seven weeks of sowing. |
| Yellow mosaic virus | It is widespread viral diseases by white fly which can be controlled through systemic insecticide. |
| Harvesting | Crop is harvested around November to December. But most of farmer leave this crop in the field for long time and when it is desired, they get it out from the field. |

Cost analysis and profit:

| For 10 decimal land | | | | | |
|------------------------------|------------------------|------|--------------------------------|------------------|-----------------|
| Total number of pits- 484 | | | Total seed- (484*0.25) =125 kg | | |
| Si no | Items | Unit | Quantity | Rate | Total cost (Rs) |
| 1 | EFY seeds | Kg | 125 | 25/- per kg | 3125 |
| 2 | Bavistin | Gm | 100 | 150/- per 100 gm | 150 |
| 3 | Compost | Kg | 484 | 2/- per kg | 968 |
| 4 | DAP | Kg | 36 | 30/- per kg | 1080 |
| 5 | Insecticide/ Fungicide | | | | 400 |
| Total | | | | | 5723 |
| Approximate Yield (210 days) | | Kg | 1452 | 25/- per kg | 36300 |
| Profit | | | | | 30577 |

Scaling up EFY cultivation in Godda

of Krishi Vigyan Kendra (KVK) Godda which provided seeds and technical training to the farmers. The package of practices was adopted by the farmers, though the crop can be harvested in 210 days, it could be stored underground for 18 month and more. On an average the farmers cultivated EFY in one decimal homestead land with an average yield of 85-100 kg in 18 months. Over the top soil, crops like pulses, maize and creepers were grown.

In 2019, the intervention was scaled up with 850 families. On field demonstrations on the crop package of practices was done with the farmers. Training around benefits of cultivating the crops was imparted through Krishi Mitra. The AEs provide input services such as seeds and marketing services at the door step to the farmers. AEs invest the working capital in

procuring the seeds. In 2019-20 earned a profit of Rs 90,000 in one season by procuring the seeds in bulk from Bihar and selling to the farmers at low cost.

The seed is usually sown in May and harvested in November. Majority of farmer harvested their crop and sold with an average price of Rs 40/- per Kg after keeping 60% of the produce for own consumption and seed. The average production per family was around 80 Kg- 1qnt in 1 decimal of land in the homestead land. This was the first time I grew Aul (EFY). I procured 10kg seeds from Agri Entrepreneur at 20Rs kilo. I had a yield of 3 quintal. I kept half the production for home consumption and sold the other half next year at the Rs 40per kg, says Phobiya Devi, a woman farmer from Mahagama block.

