

#### May/ 2022





#### APART: Adding Value to Increase Resilience, Production And Value Addition of Horticulture Value Chain

DoH & FP is the Operational Project Implementation Unit (OPIU) under APART supported by two international agencies



World Vegetable Center

#### **Major Project Interventions**

- Development of 167 clusters in APART district
- Demonstration of Climate Resilient Technology and Market-Led Activities
- Demonstration of Post– Harvest
  Management (PHM) Techniques
- Application of IPM systems to reduce the use of pesticides and promote vermicomposting units

- Market linkage through
- Value Chain Schools
- Cold Chain Storage Facilities
- Provision for specially designed
  - 4 wheeler transport vehicles
- Formation of FFS (Farmer Field Schools) and FPCs (Farmer Producer Companies)
- Intensification of Vegetable Nursery for Seed Production
  - Awareness and Capacity Building

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#### **First Edition**



#### Message From The Director's Table

Horticulture and Food Processing, Assam, Khanapara, Ghy-22



The Vision of Assam Agribusiness and Rural Transformation Project (APART) is to add value to increase resilience, production and value addition in selected Vegetable, Fruits, Spice and Potato value chain of Assam. The CRML ( Climate Resilient and Market Led) technologies and Best Management Practices (BMP) developed or disseminated through Demonstrations have been taken up in cluster ap-

proach and implemented in 14 APART (undivided) districts of Assam. The impact of project interventions will be visible in the field level if these Technologies are adopted and replicated by the farmers. Since 2018, lot of activities were implemented in the field level through project interventions. Documentation of these activities, case studies, best practices are very important for cross learning and for adoption in the Farmer's field.

I am happy that OPIU –Horticulture and FP has taken steps to bring out the first edition of quarterly Newsletter "Horticulture bytes" for knowledge and wider public information. I extend my best wishes in this endeavour.

I have great hope that continuous efforts from OPIU –Horticulture and FP at state level and district level team shall produce desired results and will be able to bring in a change in the Rural economy of the state.

Shri Triranga Bharatiya Borah , Director Horticulture and Food Processing, Assam



OPIU, Horticulture and Food Processing under APART has been working in Vegetables, Fruits, Spice and Potato value chain development by adopting cluster approach since inception of the project. Collectivizing farm produces and linking with market shall result in higher price realization of the farm produces of the Farmers. OPIU Horticulture is also taking care of this aspect by channelizing all the demonstration and extension services through FPCs for increasing the volume of production.

This Newsletter is a step taken to disseminate the knowledge and information of the activities and progress of implementation in APART Districts. I hope this effort will lead to knowledge creation for future scope of Projects, to be implemented.

> Shri Khagendra Sarmah DDA (Seeds) cum Nodal Officer OPIU, APART

#### **INTRODUCTION**

The OPIU- Horticulture was formed in the year 2018 under the under World Bank Financed Project -Assam Agribusiness and Rural Transformation Project (APART) as one of its implementation unit. The OPIU runs its cell from Directorate of Horticulture & Food Processing, Khanapara, Assam. The **OPIU** has undertaken many activities till date since its inception.

Till **OPIU-Horticulture** now. has completed the targeted demonstrations in selected vegetable, Fruits, Spice & potato viz. Cauliflower. Tomato. Cabbage. Brinial. Pumpkin, Ginger, Banana, Potato using different CRML (Climate Resilient and Market Led) technologies for different crops. Some of include Cluster approach demonstrathem tion for selected vegetable, potato and banana for better and stable market linkage. Some of the demonstration with different technologies like Best Management practices for potato, guideline and Improved Production Integrated Pest Management for selected shelter for Tomato. the districts. Mechanization of cultivation were also demonstrated.





Pineapple has been newly added as one of its crop under OPIU- Horticulture. The **OPIU-Horticulture** has given back end support under VNEDP (Vegetable Nursery **Entrepreneurship Development Program) to 58** private nursery entrepreneurs in the state. The OPIU has provided Capacity Building and Hand Holding Training support to Farmer Producer Companies (FPC)s. Potato Value Chain Schools (VCS) has been formed under supervision of the **OPIU**the Horticulture in collaboration with CIP for setting up of Potato based business enterprises.

The OPIU has taken up Post Harvest vegetables, Minimum/Zero tillage and rain Management (PHM) Activities for imparting Banana Production awareness and sensitization on different Pre Enhancement Program were done in some of Harvest measures and Post-Harvest Handling Potato to the farmers. PHM aims to give knowledge to the farmers regarding harvesting procedures and maturity indices for better PHM of the Horticultural Commodities. PHM accessories and machineries support viz. Crates, Weighing **Balance**, Kilta, Field Trolley, Slicer & Tray Dryer for ginger has been given by the OPIU to the beneficiaries. PHM Training programme were also provided to the **BODs** and **Progressive Farmers** of FPCs

#### **INTRODUCTION**

During Financial Year 2021-2022 Potato Value Chain Cafeteria, an unique approach to showcase Potato varietal diversity and awareness among farmers, has been implemented in APART project districts to showcase suitable diverse and improved varieties along with best management techniques for Potato. Setting up of Low cost Net House for Potato Seed Production has been taken up as a new activity in Business mode under the OPIU. It aims to produce quality virus free potato seeds to help the Farmers and the Processors, so that, they which is hoped to reduce the dependency on other can access market easily for their commodities. states for good quality potato seeds in the long run. With the initiative of DH&FP, APART and CIP (International Potato Center), the formal seed production system of Potato has started in Assam through FPC.

Different CRML technologies for vegetable Value Chain Development referred by World Vegetable Centre (WVC) viz. Enriched Vermicompost, Seedling Trays, Coloured Sticky Traps, Border Crops, Trap Crops, Intercropping has been taken up by the OPIU.

Τo develop Vegetable Nursery Entrepreneurs, OPIU-Horticulture has organized practical residential training for the selected beneficiaries.

**Open Pollinated Seed Production of Tomato** and Pumpkin through seed village as promoted by World Vegetable Center has been carried out on



pilot basis in APART districts by the OPIU.

Market linkages for Potato and other Vegetables has been taken up by the OPIU under APART



In this regard Technical Training regarding Capacity Building, Market Linkages and Price Realization has been conducted in APART districts for the BOD of FPCs.



With the initiative from District Horticulture Coordinators (DHC) of APART and ATMA district team, efforts are going on for convergence with PMKSY (Prime Minister Krishi Sinchoy Yojana) in Horticulture Crops. Around 40 farmers from Sarbhog FPC from Barpeta District and in Banana Cultivation through Rangmon FPC Ambuk and Madang Part II Rongjuli Dev. Block in Goalpara District got the support of drip irrigation under PMKSY. It will be replicated in all the APART Districts. It is hoped that OPIU Horticulture shall be able to achieve the project targets and implement the activities on time to give the farmers / FPCs the scope for increasing their income.

This newsletter is envisaged to act as a vehicle for knowledge dissemination to bring in convergence and harmony to all the activities focusing on Horticulture.

# A Glimpse Of Different Activities Taken Up

					(Unit in nos.)						
Activities/	2018-19		2	2019-20		2020-21		2021-22		Cumulative	
Sub-activities	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	
Potato	504	504	450	450	270	270	540	540	1764	1764	
Tomato	150	150	126	126	189	189	477	477	942	942	
Cabbage	150	150	112	112	168	168	348	348	778	778	
Cauliflower	150	150	96	96	144	144	324	324	714	714	
Brinjal	150	150	108	108	162	162	270	270	690	690	
Pumpkin	150	150	112	112	168	168	276	276	706	706	
Ginger	150	150	25	25	5	5	4	Ongoing	184	180	
Banana	180	180	75	75	30	30	4	Ongoing	289	285	
Pineapple							20	Ongoing	20	0	
PHM			180	180	255	255	135	135	570	570	
IPM			25	25	25	25	25	25	75	75	
Mechanization Demo for Potato	35	35	70	35	70	65	70	70	245	245	
Grant to Private Nursery Development	10	7	10	8	10	0	44	30	59	45	

















#### TRAINING AND OTHER ACTIVITIES UNDER POTATO CAFETERIA

OPIU-Horticulture and Food Processing has undertaken implementation of Potatoes Cafeteria in 14 Districts of Assam under World Bank funded project APART (Assam Agribusiness and Rural Transformation Project) to showcase different varieties in one plot of land to find out the suitable varieties both for table purpose and processing purpose in a district. Crop Cafeteria provided an opportunity to witness relative performances of various varieties of potato having different maturity period, diseases resistance, purposes (table/ processing), tuber shape, size colour, uniformity along with suitable agronomic production technologies.

The Six numbers of Potato varieties selected for Technology Demonstration in Potatoes Cafeteria were Kufri surya, Lady rosetta, Kufri himalini, Kufri mohan, Kufri chipsona 3 and Kufri jyoti.

The detail findings will be published in the next edition.







Post Harvest

# **POTATO VALUE CHAIN**

# Grading/Preference of CIP introduced technologies is being done as per the preference and adoption among the farmers.

	Particular	Technologies	Rating by popularity		Remark
		Potato Production with Best Management Practices (BMP)	More than Average	Ι	BMP and ZTSM
	Climate resilient	Potato Production with Zero-tillage & Paddy Straw Mulch(ZTSM)	More than Average	II	technologies are getting popular and these technologies are to be scaled up. The Benefit : Cost ratio
and the second s	practices in the APART	Potato Production with Raised Bed & Paddy Straw Mulch	Average	III	of BMP and ZTSM is 1.8 and 2.5 respectively. ZTSM is more preferred among the farmers.
		Potato Production with Partial Root-zone Drying method	Below Average	IV	Tarmers.

Grading/Preference	es of Techno	nlagies frai	n ( 'IP -
Ulaung/litter			

Particulars	Technology	<b>Ranking/Preference</b>	Remark
Best fitted Varieties	K surya, K jyoti, K himalini, K khyati, K pukhraj, K chipsona 3, K chipsona 4, Lady rosetta, Atlantic, K mohan	K pukhraj, K jyoti, K surya & Lady rosetta K chipsona are popular	Process varieties are to be scaled up for better market linkages.
Potato Value Chain Mechanization	Power driven Planter, Harvester, Grader	Harvester is more popular than automatic planter, land situation based semi automatic planter required.	Tractor driven mobile potato grader for better market linkages of processing varieties.
Value Chain School	34 established (with 797 members)	Potato Khurma, Potato Pickles are most popular innovations	Potato Khurma and Potato Pickle, Low cost potato storage are to be scaled up.

Eco	Economic analysis of Climate Resilient Technologies for Potato Value Chain						
Sl. No.	Cost of Particular operations	Best Mgmt Practices (BMP) in Rs.	Zero-tillage with Paddy straw Mulch in Rs.	Raised Bed with Paddy Straw Mulch in Rs.	Partial Root-zone Drying in Rs.	Conventional Production in Rs.	
1	Cost of Culti- vation	1,71,600	1,21,400	1,62,000	1,70,600	1,76,900	
2	Average Tuber yield kg/ ha	22,000	22,000	24,000	22,000	16,500	
3	Sale price ( Rs/ kg)	14	14	14	14	14	
4	Gross Income	3,08,000	3,08,000	3,36,000	3,08,000	2,31,000	
5	Net Income	1,36,400	1,86,600	1,74,000	1,37,400	54,100	
6	Benefit : Cost ratio	1.8	2.5	2.1	1.8	1.3	

Note: Potato Seed cost @ Rs 34/kg is very high as it is transported from North India, it can be reduced after local seed production



# **VEGETABLE VALUE CHAIN**

#### **Economics & Cost Comparison: Demo vs. Control**

	Demo Plot	Control plot	As per PIP	Yield in MT/ha		Cost: Benefit		Comparison	
Сгор	Cost/ha (Rs.)	Cost/ha (Rs.)	Cost/ha (Rs.)	Demo	Control	Demo		Percentage increase in Yield	Percentage increase in Cost of Cultivation
Brinjal	1,51,874	103026	82,932	29.3	23.2	4.4	3.8	26.29	47.41
Cabbage	1,58,184	97944	71892	28.3	22.4	4.2	3.5	26.34	61.50
Cauliflower	1,57,128	97284	71892	25.5	21	3.9	2.8	21.43	61.51
Pumpkin	1,78,552	111606	67780	24.8	19.2	2.9	2.1	29.17	59.98
Tomato	1,50,396	95568	82932	32.4	27.5	3.1	2.5	17.82	57.37
•Average Sa	Average Sale price of Brinjal, Cabbage, Cauliflower & Pumpkin @ Rs. 15/Kg								

•Average Sale price of Tomato @ Rs. 10/Kg

The Above analysis is based on Demonstration done during 2020-2021

#### **OP line seed production of Tomato and Pumpkin**

Production of seeds of WorldVeg's open pollinated (OP) lines of tomato and pumpkin through seed village approach was carried out on pilot basis in Nalbari, Jorhat, Biswanath & Golaghat districts during the 2020-21 and extended to other APART districts in 2021-22

**OP line Tomato: AVTO 1424** 

**OP line Pumpkin: AVPU 1391** 

•To make the seed easily available at low cost.

•Farmers can keep the seed upto 3 years.

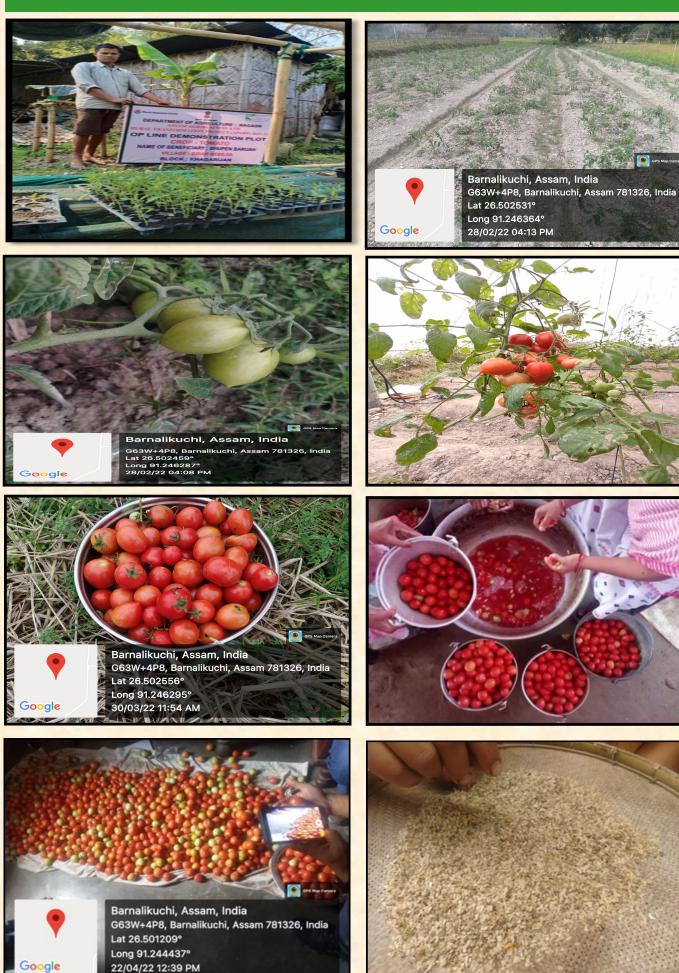
•Adapt to local ecosystem.

This activity can be scaled up further with more such demos and adoptions. More preferably OP -Pumpkin can be taken for a bigger scale up.



AVPU 1391

#### Tomato OP line –AVTO 1424 from field to seed Extraction



# Different practices from seedlings to post-harvest for vegetables









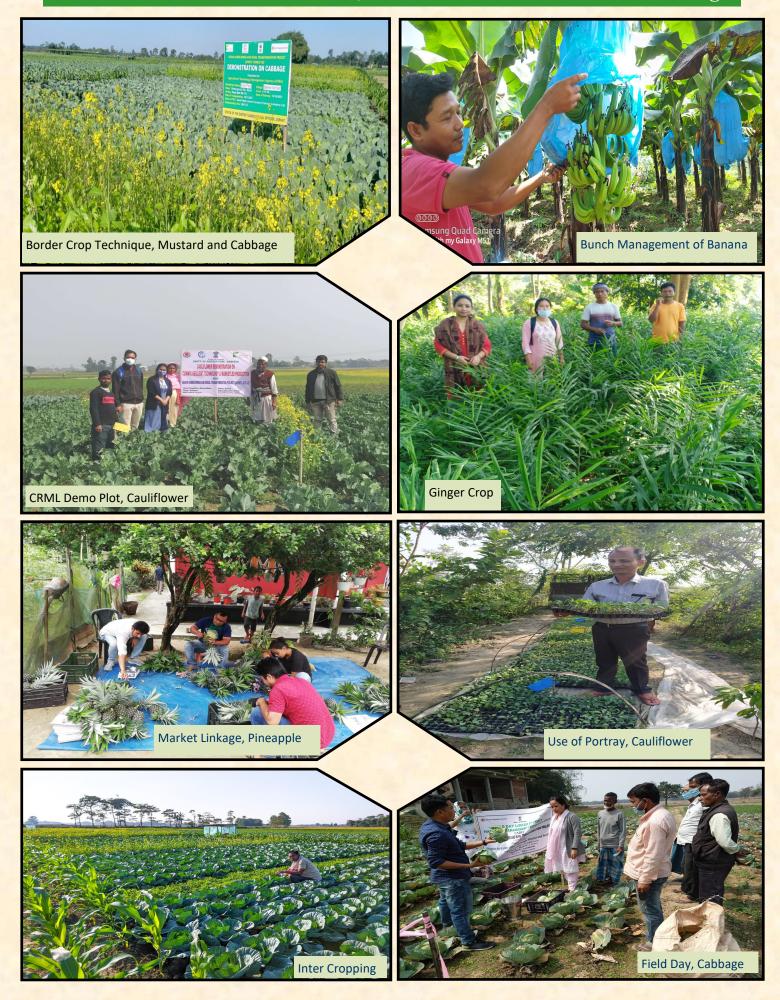




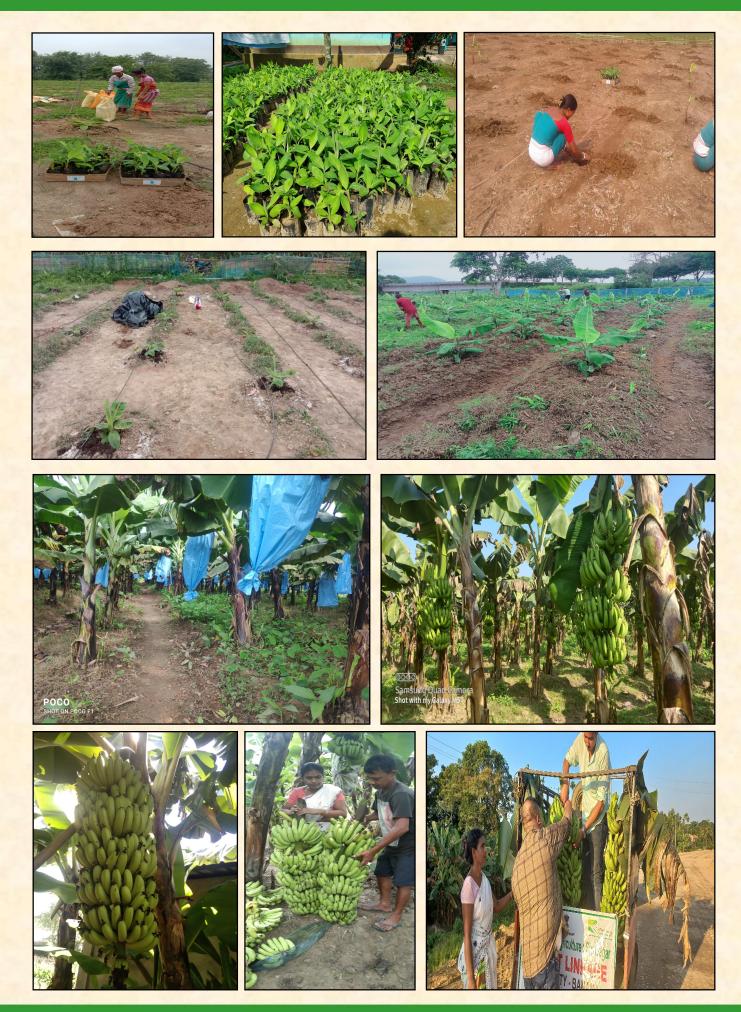




#### Various Activities under APART, OPIU-Horticulture & Food Processing



## **Snapshot of Different Stages of Grand Naine (G-9) Banana Cultivation**



# Enterprise Development through Vegetable Nurseries

Year	Plan	Achievement
2018-2019	10	7
2019-2020	10	8
2020-2021	10	0
2021-2022	44	44

To develop Vegetable Nursery Entrepreneurs, OPIU-Horticulture, has organized 4(four)days practical residential training of 54 selected beneficiaries in 2 batches, at Daffodil College of Horticulture and Daffodil Nursery.



#### **GLIMPSES OF BUYER / SELLER MEET**

BUYER / SELLER MEETs are being conducted by OPIU-Horticulture in collaboration with Department of Agriculture and ATMA, with the objective of creating of platform for Farmers and FPCs and other Value Chain Players, like Processors, Traders, Buyers, Multinational Food Companies, Bankers and other Agri. and allied companies. In this platform the Farmers / FPCs gets a chance to negotiate and better price realisation for their produces and in many cases MoUs are signed in the meet. In this platform, Farmers and FPCs showcases their Produces along with the information about the quantum and time of availability of the produces.



Snapshots of Various meetings, Training Programmes conducted for Capacity Building of the BODs, Staff of the FPCs. The training Programme were conducted in District and Sate level. Fifteen nos. of batches were trained successfully covering 370 nos. of Persons.



### **PAPER CUTTINGS**



বৰছলাৰ চেঙাহিলৈত ২০ বিঘা মাটিত কল খেতিৰে দেখুৱাইছে আদৰ্শ

শোণিতপুৰৰ বজাৰ দখল কৰিলে অমৃত সাগৰ, জি৯ আৰু মালভোগ কলে

নাত হয় গ্ৰাপ্তিল বাজাৰ নিৰম্বা মহাল কৰ্মনাস্কালন কাম্যা হাবাগুলি খাই জালৈ চাললি মেলা সময়তে শোলিতপুৰ গৰাহাল বাজিৰে আদৰ্শ নেতৃবাইছে শৈলেন বা আৰু প্ৰবীণ দৈমাৰী নামৰ সুজন পলাল হৈ লা গাঁৱত ায়াৰা আৰু প্ৰবাদ দৈমাৰী নামৰ দুজন লোকে। ভাহি লৈ গাঁৱৰ শৈলেন স্বগীয়াৰী আৰু

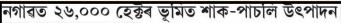


অনসমূহ জিলামনৰ নিটা প্ৰায়া কৰাৰে তি তেনি তোৰা লগাকে জুমীয় বানগানী সকলৰ পাইজনী লাহত কল সমূহ বিধী বাৰগ্য কৰিছে। এই কল (দেহিল লগত জন্মিত গৈচেল স্বামীয়া জান্দ্ৰ কিন সৈমানীয়ে জানিব নিয়া মতে যোবা বছৰক তেওঁলোকে এই কলাপেই আস্বা কৰাৰিক। হোচ তেওঁলোক বেঠা কলাপেই জান্দ্ৰ কৰা বিকা সেচিত তিনি লক্ষাক কলা আছে। নোৱা বুই-কিনি মহ কা তিনা কৈলমক আজ্ঞা সৈক আৰু কেনিতা নাজৰ ইয়াৰ উৎপান্দ আৰম্ভ হৈছে আৰু চাহিদা যথোঁ ভাল । বৰ্তমান অমৃত সাগৰ প্ৰতি কেজি ৩০ টক নামত, জি ৯ প্ৰতি কেজিত ২০ টকা নামত আৰু মালভোগ কল প্রতি কেন্দ্রিত ৫০ টকা দামত বিষ্ট হৈ আছে।বৰ্তমানলৈকে ৪০ কুহন্টন উৎপাদি। কল্ বিস্কৃট কৰিছে বুলি জানিবলৈ দি ইয়া কল (বৰু) কৰেছে বুলে আনবলে সং হয়ে জাৰ্মা হেকাৰ কৰে হাৰীন সৈমাৰীয়ে। ইপিনে যি সময়ত সময়ত সংস্থাপনৰ বাবে একালে নিবৰুৱাই নিধুৰ হৈ বহিৰাজ্যলৈ ঢাগালি মেলিছে তেনে সময়তে ৰৰছলাৰ চেংগাহিলৈ বাঁৱৰ এই দুজন বান্ধিয়ে কল খেতিৰে নিকুৱ সমূহন্যা সমাধানৰ সম্ভাৱনীয়েতাৰ উৎকুটিজ্ঞ দ্যা সমাধানৰ সন্ধা শন লাঙি ধৰাই নহয় ব পথ হ'ব পাৰে ভাগ openit of

গ্ৰশীশমেহাৰীয়ে নিজৰ ২০ বিখা মাটিত কলপেন্টি কলি নিকুৱা সমন্যা সমাধানন সন্তাক্ষীয়েকাৰ এক উৎকৃষ্ট উপাহৰণ দাঙি ধৰি কড়িয়াইছে আলন হেজনী। শৈকেল ক্ষীয়াৰী আৰু প্ৰধীণ টেমাৰাজৈ ২০ নিখা মাটিত কৰিছে অমৃত সাগৰ জিঠ আৰ মানাতগো ক পাৰ্কি ত কিছে। তেওঁলোকত উৎপাধিত অমৃত সাগৰক জিঠ আৰু মানতোগ

संटिनल-9

कृषि विभाग की पहल से साग सब्जियों की अच्छि पैदावर से लाभान्वित हुए किसान





উৎপাদন কোম্পানী-কৃষি বিভাগৰ প্রচেষ্টাত সুবিপণনৰ প্রয়াস

# growers get high prices

A CORRESPONDENT NAGAON, May 8: District Agriculture Department, Nagaon has taken a slew

agaon has taken a slew f initiatives to provide the true value as well as rices of vegetables and ther agricultural products to the farmers of the dis-ict. Besides, the depart-tent concerned has also n -provide s well as



tables produced in a mas sive way by a host of agri culture production compa nies of the district. Over 14 agricultura production companies o

production companies of the district inked an agree ment with the company is a meeting held at the of fice of district agricultur department. Naeaon of



### 'এপাৰ্ট'ৰ আঁচনি পৰিদৰ্শন টাইৱানৰ বিজ্ঞানী দলৰ

নিজা বাতৰি দিওঁতা

পুৰণিগুদাম, ২৪ এপ্ৰিল ঃ বিশ্ববেংকৰ সাহায্যত 'অসম কৃষি বাণিজ্য আৰু গ্ৰাম্য ৰূপান্তকৰণ' (এপাৰ্ট) নামৰ এখন আঁচনি কৃষি বিভাগৰ লগতে আন কেইবাটাও বিভাগত ৰূপায়ণ কৰা হৈছে। এই আঁচনিখনৰ জৰিয়তে টাইৱান, পেৰু ইত্যাদিৰ বহুকেইটা গৱেষণা প্ৰতিষ্ঠানে কাৰিকৰী দিহা-পৰামৰ্শৰ লগতে নতুন নতুন প্ৰযুক্তিৰ দ্বাৰা অসমৰ কৃষকসকলৰ শস্য উৎপাদন বৃদ্ধি আৰু অৰ্থনৈতিকভাৱে উপকৃত কৰাৰ বাবে ব্যৱস্থা হাতত লৈছে। বিশেষকৈ সুষম মাত্ৰাত ৰাসায়নিক সাৰ তথা কীটনাশক দৰৱ ইত্যাদি প্ৰয়োদ কৰি উন্নত পদ্ধতিৰে কবি, বেঙেনা, ৰঙালাউ আদিৰ প্ৰদৰ্শনমূলক খেতিৰ দ্বাৰা যাতে কৃষকসকল লাভান্ধিত হোৱাৰ উপৰি আমাৰ পৰিৱেশ প্ৰদূষণ নহয়, তেনেকুৱা বিষয়ত টাইবানৰ বিশ্ব শাক-পাচলি কেন্দ্ৰই গুৰুত্ব দি আহিছে। নগাঁও জিলাত এই আঁচনিখন পৰিদৰ্শন কৰিবৰ বাবে আজি কেন্দ্ৰটোৰ দুগৰাকী বিজ্ঞানীৰ লগতে অসমৰ এটা প্ৰতিনিধি দলে জিলাখনৰ কেইবাজনো কৃষকৰ পথাৰ পৰিদৰ্শন কৰে। বিশ্ব শাক-পাচলি কেন্দ্ৰ, টাইৱানৰ জ্যেষ্ঠ উদ্যানশস্যবিদ, ড° পাওলা কাৰডনা আৰু পতংগবিদ ড° চোপানা ইয়লে ডাকৰঘাটৰ প্ৰগতিশীল যুৱ কৃষক পলাশ প্ৰকাশ শইকীয়াৰ পথাৰত 'আটমা'ৰ দ্বাৰা ৰূপায়ণ কৰি থকা ৰঙালাউ প্ৰদৰ্শনমূলক খেতি চোৱাৰ লগতে কৃষকজনৰ লগত মত-বিনিময় কৰে। পাছত বিজ্ঞানীৰ দলটো কাবৈমাৰী নিলোৎপল গোস্বামীয়ে কৰা নাৰ্ছাৰী আৰু শেনচোৱাৰ মিঠু শৰ্মাৰ নাৰ্চাৰী তথা কেঁচুসাৰ উৎপাদন গোট পৰিদৰ্শন কৰে। প্ৰতিনিধি দলটোক জিলাখনৰ বিভিন্ন স্থানত বৰ্তমান হৈ থকা শাক-পাচলিৰ মাটিকালি, উৎপাদন তথা বিপণনৰ বিষয়ে ব্যাখ্যা আগবঢ়ায় জিলা কৃষি বিষয়া তৰুণ হাজৰিকাই। পথাৰ পৰিদৰ্শনৰ সময়ত বিশেষজ্ঞ দলটোক সকলোখিনি কথা বুজাই দিয়ে জিলা উদ্যান শস্য সমন্বয়ক পংকজ হাজৰিকা আৰু বিশ্ব শাক-পাচলি কেন্দ্ৰৰ সমন্বয়ক সুদীপ্ত দাসে। বিজ্ঞানীৰ দলটোৱে নগাঁও জিলা কৃযি বিভাগৰ তত্বাৱধানত চলি থকা 'এপাৰ্ট' আঁচনিখনৰ কাম-কাজত সন্তুষ্টি প্ৰকাশ কৰে বুলি জিলা কৃষি বিষয়াই জানিবলৈ দিয়ে।



#### **Efforts on to ensure vegetables** growers get high prices

A CORRESPONDENT NAGAON, May & District Agriculture Department, Nagaon has taken a slew of initiatives to provide the true value as well as prices of vegetables and other agricultural products to the farmers of the dis-trict. Besides, the depart-ment concerned has also made arrangements to exmade arrangements to ex-port those agricultural products to outside the State, sources said.

products to ourside in State, sources said. These steps to strengthen the financial community as well as to avail the actual market prices of their respective agricultural products, have been initiated by the district agriculture departs ment in a joint venture under special pursuance of district agriculture officer Tarun Hazarika, district ag-



tables produced in a mas-sive way by a host of agri-culture production compa-nies of the district. Over 14 agricultural production companies of



# HORTICULTURE Bytes

# **OPIU (Horticulture)-APART**

Directorate of Horticulture and Food Processing,

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