

White Onion Cultivation in PPP-IAD Project 2013-14 – Success Story (Jain Irrigation Systems Ltd, Jalgaon)

White Onion Cultivation

White onion offers great potential for processing and the activity is prevalent in Jalgaon, Dhule, Nandurbar districts of Khandesh & Amravati, Akola, Buldhana districts of Vidarbha. Jain Irrigation Systems Ltd (JISL) is established a state of art onion & vegetable dehydration factory in Jalgaon & process white onions & other vegetables. Dehydration requires a specific processing variety for dehydration. There were no white onion variety available specific for processing. Jain Irrigation Systems Ltd (JISL) established a state of art Onion & vegetable dehydration plant in Jalgaon in 1994. Initially onions were procured from open market. Subsequently, JISL developed a dehydrator white onion variety (JV12) after a continuous & rigorous research, developments & field trials & introduced it with growers in the region through contact farming and buying back entire produce for processing.

Objectives -

- To increase farm productivity, reduce cost of production and minimize losses in supply chain.
- To implement JAINGAP to promote sustainable agriculture.
- To help in capacity building of the farmer with an integrated approach to develop sustainable agriculture.
- Buy back, value add by processing & market to complete the value chain.

Achievements of the PPP-IAD project:

- 19.645 MT seed was supplied to the selected 2208 farmers.
- Area covered was 1957.9 Ha against a target of 2000 Ha which is about 98% of the targeted area
- About 82% of the total area cultivated was sown directly by planter
- Cost of cultivation reduced by Rs. 7000 to 8000 / Acre by mechanization.
- Area under Micro Irrigation System (MIS) was about 85% of the total area cultivated in this project.
- Implemented JAINGAP- a food safety, traceability & quality management systems for entire white onion cultivated area.
- 100% of white onions produced (35392 MT) in this project was procured directly by the company.

Impact of PPP-IAD project implementation:

- Financial assistance provided through PPP-IAD project helped many small & marginal farmer to buy the planter
- Many farmers rented their planter which created an opportunity to develop village level agri. entrepreneur.
- Partnership approach due to PPP-IAD project has increased the confidence of the growers.
- Efficient & 100% procurement by company has made the farmer to build trust with a win pricing mechanism.
- Implementation of JAINGAP has created awareness among the growers about food safety, workers welfare, personal hygiene and environment protection.
- GHG emission was calculated to be 2390.3 Kg/Ha and about 64.3 Kg/MT of onion produce.

Benefits of the PPP-IAD Project to the farmer:

- 1) Increase in farm productivity not only in white onion but also in other crops
- 2) Reduce cost of cultivation by adapting mechanization, judicious use of resources by implementing Good Agricultural Practices (GAP)
- 3) Reduce losses in the supply chain
- 4) Increase in area under onion
- 5) Transfer of Hi tech / improved technology
- 6) Assured buy back mechanism for assured income
- 7) Development of Sustainable agriculture by conserving, judicious use, development & enhancement of natural resources
- 8) Conservation, protection & enhancement of biodiversity
- 9) Conservation, protection & enhancement of environment
- 10) Human welfare through by promoting safety, hygienic practices

JISL Initiative:

- JISL developed contract farming through 60 agriculture extension associates for the white onion growers.
- Company's extension & contract farming team provide timely & on-field agronomical guidance throughout the crop season to ensure high productivity, better quality & agricultural sustainability.
- High yielding white onion variety named JV12 (with TSS 18-20%) was developed by JISL through a dedicated research and is provided to the farmers at a reasonable cost. This variety is suitable for processing, have high pungency, good flavor and suitable for long storage.
- JISL developed a Onion Planter for direct seed sowing which reduced cost of production and maintained desired plant population on raised bed as a result productivity increased.
- Company's extension team aware to the farmers about water and fertigation management for onion crop and convinced them for implementation of Micro Irrigation Systems and do endeavor for cover 100% area under MIS for tremendous growth in productivity.
- Capacity building programs are organized for farmers from time to time. The rationale behind this was to increase the knowledge and awareness level of the farmers and inform them of best practices.
- JISL developed JAINGAP standard, it is Food Safety Management System for primary production. It helps in maintaining traceability by record keeping in prescribed format, health, safety, hygiene, sanitation, worker welfare, risk assessment and analysis. It ensures food safety and sustainability standards along the entire supply chain.
- The gunny bags are being provided by JISL free of cost to the farmers for packaging. The cost of one gunny bag is Rs 22. Thus farmer saves the packaging cost and these bags can be reused for at least 3-4 times.
- Company buys the total white onion produce from farmers at a minimum price decided at the beginning of the growing season or average of the market price on the day of procurement, whichever is greater.
- JISL encouraged to the growers about biodiversity conservation in their field for maintain GHG emission with increasing productivity.
- JISL directly procure Banana & Mango fruits also from growers.

Involvement of Farmers:

Total 2208 farmers were involved in the PPP-IAD white onion project 2013-14. Out of that some farmers have very good experience of white onion bulb production through Jain Irrigation's white onion cultivation techniques with PPP-IAD project. Therefore all farmers involved in the project were interested for implement the new cultivation practices for white onion crop.

Farmers Training:

Growers & workers actually working in the field are trained by JISL field extensionsts & a team of multidisciplinary expert along with State Government Officials. Training includes topics are new cultivation practices, food safety & hygiene, IPM etc. Therefore farmers showed very good interest in training & field visit program.

- **Farmers training & field visit**



Direct sowing by Onion Seed planter:

Due to use of onion seed planter labour cost reduced by about 80 to 85 % as against the cost incurred in nursery raising & transplanting with increase the productivity of the crop. For encourage to the farmers, Financial Assistance helped the growers to buy the planter & achieve Mechanization even in marginal area, hence about 82% of the total area was sown directly by planter in 2013-14.



Bed formation & direct sowing by onion seed planter

Irrigation Management:

Conventionally, farmers used flood irrigation for onion cultivation. This method required large volume of water. In contrast to this, micro irrigation promotes water application at regular interval thereby maintaining optimum moisture level at the root zones for a longer period. PPPIAD projects aims at encouraging the use of micro irrigation in the onion growing belt. Uniform and efficient use of fertilizers is also ensured through the drip irrigation system. As a result about 85% of the total area under this project was on MIS. Method of irrigation was through inline drip, micro sprinkler and rainport irrigation system.

As example Mr Devendra Ramdas Chaudhari, Village- Ahirwadi, District- Jalgaon. The crop under onion used 5.28 Mega lit/ha 5.12 Mega lit/ha and 4.8 Mega Lit/Ha in 2011-12,

2012-13 & 2013-14 respectively. The water usage has come down in 2013-14 as compared to 2012-13.



Onion crop with Inline / Rainport / Micro sprinkler irrigation system

Judicious & Efficient use of Resources:

- Water – it is efficiently applied & used by the plant through Micro Irrigation System (MIS). About 40-50 % water is saved as against flood irrigation. It automatically reduces the power consumption by 50%.
- Fertilizer – uniform & efficient use of fertilizer through drip fertigation systems, saving up to 30% fertilizer as against hand application. Reduces losses & environmental pollution from leaching & loss of nitrogen in the environment.
- Power – less power is used in pumping irrigation water as MIS is use

Application of Fertilizers:

Fertilizers were applied as recommended for the white onion crop as per the guidance of JISL's extensionists based on soil analysis. Fertilizers were applied in split doses during entire crop cycle. Water soluble fertilizers were applied through drip irrigation & fertigation system; water insoluble fertilizers were applied manually when there was sufficient moisture available in the soil. At times soil conditioner enriched with different cultures like azetobactor, phosphorus soluble bacteria, trichoderma were applied to improve soil texture & upliftment of various inputs by the crop. Recommended doses & controlled application methods reduced the loss of fertilizer by leaching & loss of nitrogen in the environment. Photo shows crop growth & soil texture.



Photo shows crop growth & soil texture.

Plant Protection Products (PPP) & personal health & safety:

In farming at the time of application of plant protection products or any other farming operation farmers neglected or unknown about personal health & safety. Therefore Jain Irrigation has creates awareness about safety in farmers mind and due to financial support by PPP-IAD project personal protective equipment (Pesticide container, Protective clothing & First Aid Kit) distributed to the 2141 farmer



Use of personal protective equipments while applying plant protection products

Procurement:

- The Company buys the 100% white onion produce from farmers at a minimum price decided at the beginning of the growing season or average of the market price on the day of procurement, whichever is greater.
- The procurement centre is at Jalgaon.
- Farmers bring their produce at the procurement centre in gunny bags. These gunny bags are being provided by JISL free of cost to the farmers for packaging. The cost of one gunny bag is Rs 20. Thus farmer saves the packaging cost Rs.5000/- per acre.
- We have procured 35392 MT white onion in PPP-IAD white onion project 2013-14.



Yield Comparison:

Year wise average of all farmers and district wise one farmer's yield mentioned below.

District	Farmer Name	Year wise Yield (MT)		
		2011-12	2012-13	2013-14
	Average of all farmers	9.57	9.71	7.38
Jalgaon	Mr Devendra Ramdas Chaudhari	19.00	18.78	10.85
Dhule	Mr Bhatu Waman Surywanshi	11.76	13.31	7.93
Nandurbar	Mr Dileep Rohidas Patil	10.24	11.78	7.68
Buldhana	Mr Dnyaneshwar Ramkrishna Sonawane	12.08	12.99	9.00

Growers achieved better yield in 2011-12 & 2012-13. However, due to sudden hail storm, the yield in 2013-14 dropped down. Cost of production has gone down by the use of onion seed planter. In last three years prevailing market price were higher than the Minimum Guaranteed Price (MGP). Hence it is an excellent return in 4-5 months crop cycle as compared to maize, wheat, sorghum or even cotton etc.

Value Addition by Processing & Marketing:

Jain Irrigation has two onion processing facilities one at Jalgaon, Maharashtra and another at Badoda, Gujrat. The various dehydrated products offered by Jains to its customers are as follows

Sliced Onion	Custom-made
Granulated	Large Chopped
Standard Powder	Diced Onion
Toasted Powder	Standard Chopped
Toasted Minced	Small Chopped
Fried Onion	Kibbled Onion
Toasted Chopped	Minced
Premium Powder	Ground

Efforts to Make Agriculture More Sustainable through PPP-IAD:

- **Development of Variety** – JISL has developed its own high solid variety suitable for dehydration.
- **Supply of quality seed** – pure, authentic & quality seed is supplied to the growers so that minimum resources like, land, water, power, agrochemicals manpower are used to raise the crop and intern minimize environmental pollution.
- **Developments of onion planter for direct sowing**- Direct seed sowing by onion seeder reduces the labour cost by about 80 to 85 % as against the cost incurred in nursery raising & transplanting thereafter. This also save lot of time of the grower which he can utilized in other productive activities. Further, it reduces the crop duration by one month, thereby saving man, machine, power, agrochemicals, and fuels.
- **Judicious & Efficient use of Resources** –
 - Water – it is efficiently applied & used by the plant through Micro Irrigation System (MIS). About 40-50 % water is saved as against flood irrigation. It automatically reduces the power consumption by 50%.
 - Fertilizer – uniform & efficient use of fertilizer through drip fertigation systems, saving up to 30% fertilizer as against hand application. Reduces losses & environmental pollution from leaching & loss of nitrogen in the environment.
 - Power – less power is used in pumping irrigation water as MIS is use
- **Maintaining Biodiversity** – Growers are encouraged to preserve, maintain & enhance the farm biodiversity.
- **Soil to soil sustainable cycle** - The onions so produced by JISL contract growers through JAINGAP system is sent to the factory, where it is received & under goes systematic & scientific preparatory, dehydration & milling, packing & warehousing process. The waste onion dried biomass is buried in the field. And the process waste in the factory is sent to biogas generation plant. After the biogas is generated, the solid part is sent for manufacturing soil conditioner. The soil conditioner so produce is applied in the contract growers' farm to maintain fertility, soil texture & soil biodiversity to complete soil to soil sustainable systems.