SUCCESS STORY UNDER NADP (RKVY)

1.Title : **Enhancement of Productivity and Quality of Grapes through Hi-tech practices**

2. Category : **Horticulture**

Type : **Fruit Production**

3. Challenges

In Tamil Nadu, grapes is cultivated in an area of 2800 ha of which Theni district alone accounts for 2184 ha. The major grape varieties grown are Muscat Hamburg (Panneer) and Thompson Seedless. Tamil Nadu ranks fourth in area with an average productivity of 29.2 tonnes per hectare, which is low, even though 5 harvests are made in a span of two years period. Quality of grape fruits also not up to the market standard. Hence farmers follow planting of own rooted plants traditionally for several decades due to non-availability of root stocks. The productivity of own rooted grape vines are less and they also susceptible to drought, salinity and nematode. Traditionally farmers grow only two grape varieties viz., Muscat Hamburg and Thompson Seedless. Nutritional disorders like berry cracking, berry shattering, hen and chicken disorder etc., are widely prevalent. Uneven ripening and poor colour development are serious hindrance in marketing of grapes. Drought and salinity is also severe constraint in Dindigul district, parts of Theni and Tiruchi districts. Indiscriminate spray of plant protection chemicals for the management of pest and diseases, particularly during rainy season is not only increase the cost of production but also pollute the environment. Hence the **"Enhancing the productivity and quality in Grapes through Hi-tech management practices"** was undertaken to cater the needs of grape growers with the funding from RKVY (NADP with a budget outlay of Rs.2.07 crores).

Issues

- *Non-availability of new hybrids / improved commercial grape varieties*
- *Non-availability of rootstocks*
- *Nutritional disorders*
- *Uneven ripening*
- *Poor colour development*
- *Drought and salinity*
- *Indiscriminate spray of plant protection*

4. Initiative

The following activities are executed in the Grapes Research Station

- Mass multiplication of grape rootstock *viz*., Dog Ridge (*Vitischampini*) was taken up.
- A total of 130 grape varieties meant for table, juice, raisin and wine making purposes were assembled and being maintained.
- The trials were conducted to find out the suitable new hybrids / improved grape varieties suitable for grape growing regions of Tamil Nadu. The results found that new grape hybrid / improved varieties *viz.*, Red Globe, Medika, Nana Saheb Purple, Krishna Seedless, Sharad Seedless, Fantasy Seedless, Crimson Seedless, A-18/3, Sonaka Seedless etc., are performing well and found suitable for grape growing tracts of Tamil Nadu.
- Field demonstrations (45 Nos.) were conducted at farmers' fields to overcome the nutritional disorders *viz.*, berry cracking, berry shattering, hen and chicken disorder etc.,
- Periodical trainings (20 Nos.) were conducted to educate the grape farmers for the adoption of recent technologies in grapes, cultivation.
- Weather forecast facilities have been created at Grapes Research Station for providing daily and weekly forecast for the management of pest and disease problem in grapes.
- Maintenance of 130 different grape varieties at Grapes Research Station farm for mass multiplication and distribution of scion sticks for grafting purpose to the needy grape growers.
- A total of 2,25,000 nos. of Dog Ridge rootstocks and planting materials of improved commercial varieties *viz*., Red Globe, A -18-3, Medika, Nana Saheb Purple and Krishna Sharad Seedless have been distributed to the grape farmers for the enhancement of yield and quality.

Time line of actions

- Farm development works, Establishment of Trailing structures for grapes vineyard development, Strengthening of Irrigation facilities, E- communication and networking and Purchase of laboratory accessories and chemicals was completed during the period of 2013-2016.

Beneficiaries

- Supply of commercial grape varieties viz., Red globe, Shared Seedless, Nana Saheb Purple, A 18-3, Medika to the grape growers.
- Collaborations with National Grape Research for Grapes, ICAR, Pune, the apex body for grapes research in the country and Project Coordination Cell, All India Coordinated Research Project for Fruits, Indian Institute for Horticulture Research, Hessaraghatta, Bengaluru for the implementation of need based research projects on grapes in our state.
- As part of the research mandate 17 different commercial grape varieties from ICAR-National Research Centre for Grapes, Pune were introduced and are being tested for assessing their suitability under Tamil Nadu grape growing region.
- Planting of Dog Ridge rootstocks for mass multiplication and distribution to the grape growers. Dog Ridge rootstocks are used for enhancing the vine vigour, productivity and quality in grapes.

5. Key result/insight/interesting fact

- A total of 1, 75,000 nos. of Dog Ridge rootstocks have been produced and distributed to the grape growers. By this an additional area of 70 ha has been covered under grapes with new technology of *in situ* grafting.
- Created awareness and supplied scion sticks of new grape hybrids / improved grape varieties *viz.*, Red Globe, Medika, Nana Saheb Purple, Krishna Seedless, Sharad Seedless, Fantasy Seedless, Crimson Seedless, A-18/3, Sonaka Seedless etc., suitable for commercial cultivation were distributed for *in situ* grafting in the grape growers' fields.
- Field demonstrations and trainings were imparted to the grape farmers' fields to overcome several field problems in grape vineyards.

Field issues		Remedies
Berry cracking	:	Spray of Calcium Chloride @ 0.3 %
Hen & chicken disorder	:	Spray of Boron @ 0.2 %
Reduced bunch growth and berry size	:	Spray of Potassium Nitrate @ 0.5 % & Calcium Nitrate @ 0.5 %
Uneven ripening and poor colour development	:	Spray of Sulphate of Potash @ 1.0 %
Poor berry size and bunch quality	:	Use of plant growth regulators viz., GA3, Brassinolide and 2-Chloro Phenol Pyridinyl Urea (2-CPPU)

- A total of 600 grape growers have been covered under **"Weather forecast"** system for alerting the pest and disease risk and remedial measures.

6. Impact

The implementation of this project resulted in an area expansion of around 90 hectares of new area, of which around 70 hectares under seeded Muscat Hamburg and 20 hectares under commercial grape varieties *viz*., Red Globe, A-18/3, Medika, Sonaka, Thompson Seedless, Nana Saheb Purple and Krishna Sharad Seedless.

S. No.	Particulars	Quantity supplied (Nos.)	Area covered (ha)	Traditional yield / ha / yr. (Two seasons)	% of increase in yield / ha / by new technology	Enhanced yield / ha / yr. than traditional practices	Total yield enhancement (for two seasons)	Value of the produce / year (Rs.)
1.	Distribution of Dog Ridge rootstocks	1,75,000	70	32 tonnes	30 %	6.4 tonnes	448 tonnes	134.40 lakhs (448 t x Rs. 30/kg)
2.	Distribution of new commercial grape varieties	50,000	20	25 tonnes	-	-	500 tonnes	250.00 lakhs (500 t x Rs. 50/kg)

- Adoption of advanced viticultural practices by conduct of periodical training programmes, field days and diagnostic visits to the grape vineyards resulted in enhancement of grape yield and quality of marketable produce which ultimately fetched premium price in the market.
- Skill oriented viticultural and grape vineyard management practices generated employment opportunities to the rural youth women and men labourers.
- Further the exposure to the new grape varieties and value added products preparation in grapes to the rural women and farmers would ultimately benefitting them economically and socially.

7. Lessons Learned

- Farmers are ready to adopt *in situ* grafting technology by using Dog Ridge rootstocks for cultivation of new grape hybrids / improved grape varieties. Certain farmers are also

willing to become entrepreneur by cultivating juice grape hybrid **''Medika''** for commercial scale production of ready to serve beverage (RTS) / Squash / Crush.

- There is also great awareness for cultivation of red wine grape varieties viz., Cabernet Sauvignon, Shiraz, Zinfendal, Merlot etc., and white wine grape varieties viz., Sauvignon Blanc, Chenin Blanc etc.,
- ''Y'' trellis training system for grape is becoming popular among the grape growers. The initial investment cost for adoption of this system is more than expected.
- Berry cracking is a serious issue particularly during rainy season in the cultivation of Seedless grape varieties which ends in heavy crop loss. For the provision of rain shelter and spreading of polythene mulch sheet requires high investment.
- There is a great scope in Tamil Nadu to become an off-season production hub for seedless grape varieties in India during July to September months. It is highly astonished and realized that there is an untapped potential for off-season production of seedless grape varieties that fetches Rs. 10 lakh as gross profit and Rs. 6 lakh as net profit per acre.

8. Supporting Quotes and Images

1. Quotes from farmer

<table>
<tr><td>Th. N.R.Chandraprakasam
S/o. N. Raja Suruliandi
AandalKoil Street,
Anaipatty @Nagayagoundanpatty
Uthamapalayam Taluk. Theni district
Mobile: 9865939219</td><td colspan="2">  </td></tr>
<tr><td>Results obtained through the adoption of technologies by farmers</td><td>Improved production technologies</td><td>Traditional Production Practices</td></tr>
<tr><td>i. Grape Production (tones / acre)</td><td>26 tonnes
(Two season harvests)</td><td>17 tonnes</td></tr>
<tr><td>ii. Cost of production per acre (Rs.)</td><td>Rs. 2.25 lakh</td><td>Rs. 1.75 lakhs</td></tr>
</table>

iii. Net profit per acre (Rs.)	Rs. 4.25 lakh	Rs. 2.50 lakhs
iv. Product quality improvement	Excellent quality	Poor
v. Technologies adopted	❖ Use of Dog Ridge rootstocks and i*n situ* grafting on rootstock with traditionally grown Muscat Hamburg (Panneer) grape variety. ❖ Adoption of double pruning technology during summer and winter months for two harvesting. ❖ Use of plant growth regulators viz., GA_3 (10 ppm) for enhancing the size and quality of grape berries. ❖ Use of Calcium Chloride (0.3 %) for reducing berry cracking. ❖ Use of Boron (0.2%) to reduce hen and chicken deficiency. ❖ Use of Potassium Nitrate (0.5%) and Sulphate of Potash (1%) spray for improvement of berry colour, TSS and shelf life.	
vi. Natural resources saved / Conserved like Soil, Water etc.,	❖ Use of Dog Ridge rootstocks resulted in reduced the water demand and endure soil salinity by plants ❖ Use of drip irrigation system for water saving	

2. Quotes from farmer

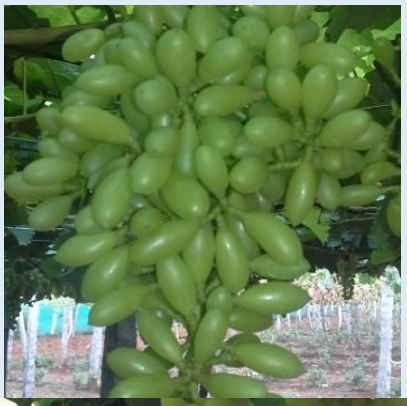
Th. S. Kanagaraj S/o., R. Suruliandy Gowder Erasai Road, Kanniservai Patty UthamapalayamTaluk,Theni district **Mobile: 9751874111**	

Results obtained through the adoption of technologies	Improved production technologies	Traditional Production Practices
i. Grape Production (tones / acre)	15 tonnes	10 tonnes
ii. Cost of production per acre (Rs.)	Rs. 3.00 lakh	Rs. 2.50 lakhs
iii. Net profit per acre (Rs.)	Rs. 6.00 lakh	Rs. 3.50 lakhs
iv. Product quality improvement	Excellent quality	Poor
v. Technologies adopted	❖ Use of Dog Ridge and *in situ* grafting on rootstock with commercial grape variety Sharad Seedless and Sonaka ❖ Pruning technology by adopting of double pruning single cropping ❖ Use of plant growth regulators for improving the grape quality.	
vi. Natural resources saved / Conserved like Soil, Water etc.,	❖ Use of Dog Ridge rootstocks resulted in reduced the water demand and endure soil salinity by plants ❖ Use of drip irrigation system for water saving	

Mass multiplication and distribution of Dog Ridge rootstocks to the grape growers

Bunch quality improvement in Muscat Hamburg (Panneer) grape using Dog Ridge rootstock

Bunch quality improvement in Medika hybrid grape using Dog Ridge rootstock



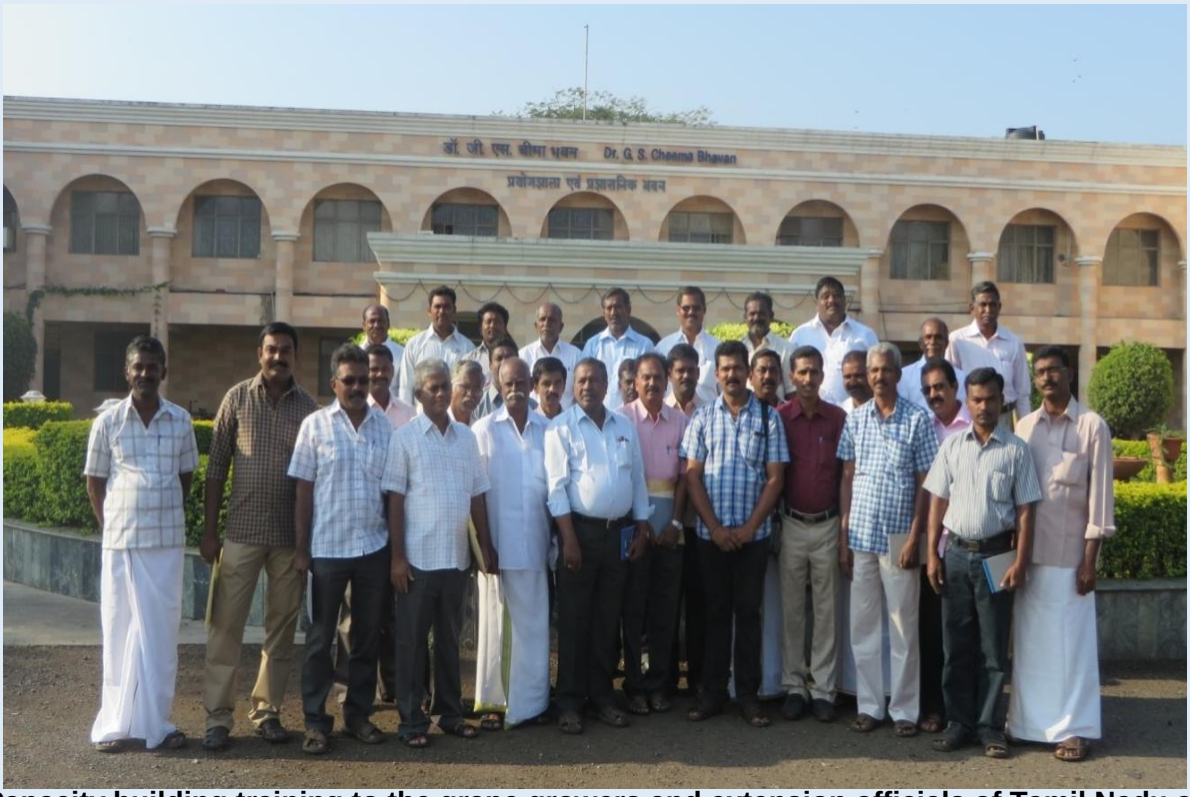
Variety: Sonaka

Farmers training programmes at village level with scientists of IIHR, Bengaluru

Address to the grape growers by Dr.N.K.Krishnakumar, Deputy Director General (Horticulture), ICAR, New Delhi

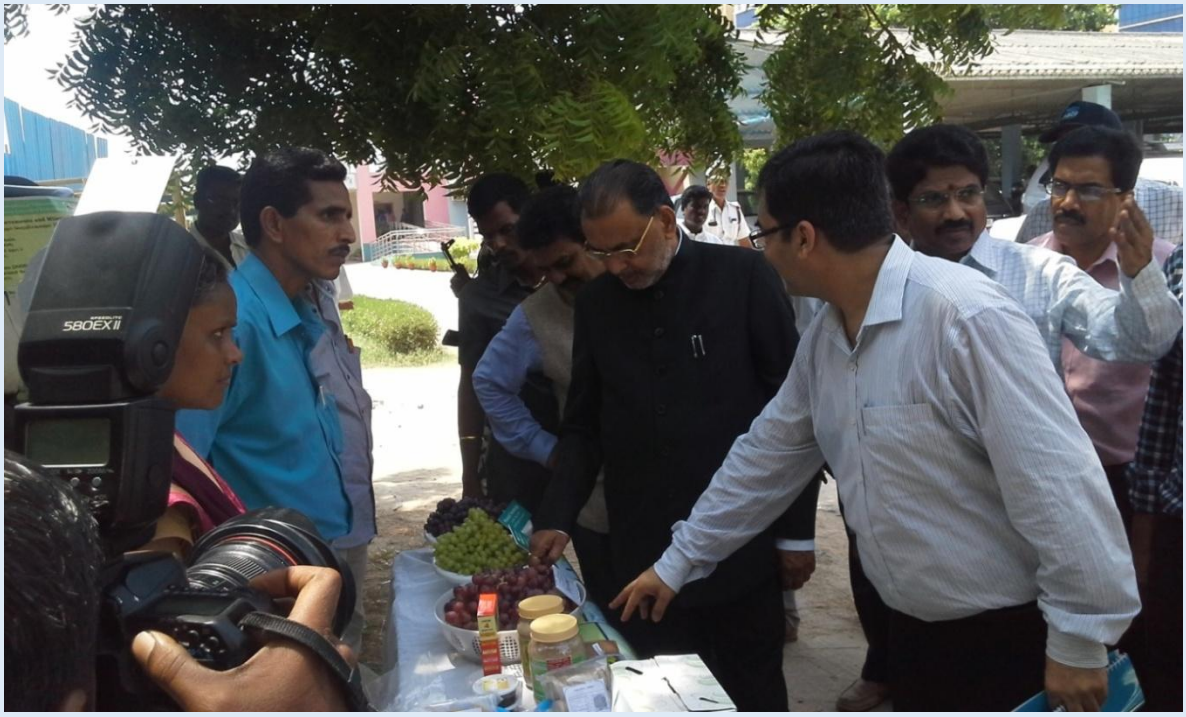
Participation in the HORTI INTEX - 2014 at CODISSIA Trade Fair Complex, Coimbatore from 7th to 10th November-2014 for exhibition of grape varieties, products and technologies

Visit by Dr. A.K. Malhotra, Commissioner of Horticulture, Ministry of Agriculture, Govt. of India to the Grapes Research Station stall on 08.11.2014



Capacity building training to the grape growers and extension officials of Tamil Nadu at National Research Centre for Grapes, Pune, Maharashtra

Exposure of Tamil Nadu grape growers to vineyards of export quality coloured seedless grape (Nana Saheb Purple)



Honourable Union Minister for Agriculture Shri.Radha Mohan Singh visit to the grape varieties and value added products stall put up during NADP-RKVY Scheme Review held at CIBA, Chennai

Third party review of NADP-RKVY Scheme by the staff in the beneficiary farmer's field (Variety - Red Globe)

9. Additional information

1. List of all project partners and / or donors who supported the work	1. ICAR-Indian Institute of Horticulture Research (ICAR-IIHR), Bengaluru, Karnataka. 2. ICAR-National Research Centre for Grapes (ICAR-NRCG), Pune, Maharashtra. 3. Grapes Research Station, Rajendra Nagar, Hyderabad, Telungana.
2. Links to the supporting materials, such as news items, photos on Flicker and presentations on Slide Share.	1. **Web Link:**https://sites.google.com/a/tnau.ac.in/grapes-research-station 2. Tamil Monthly Agricultural Magazine:**ValurumVelaanmai, March, 2017** Issue
3. Contact person for this story **(Name, Position, email address)**	Dr. S. Parthiban, Ph.D., Professor and Head Grapes Research Station, Anaimalayanpatty, Rayappanpatty Post Theni district, Pin Code: 625 526. Email: grstheni@tnau.ac.in

4. Other information

The implementation of this NADP-RKVY Scheme on ‘’Enhancement of productivity and quality in grape through hi-tech management practices’’ was really helpful in uplifting the economic livelihood options among the grape growers of Theni and Dindigul districts of Tamil Nadu for achieving the area expansion under grapes with new commercial grape varieties and also by adopting advanced viticultural practices for enhancing the yield and quality of the grape.

Checklist

No.	Question to consider	Yes	No
1.	Is the story interesting to the target audience of the project / activity report?	Yes	-
2.	Does the story explain what new insights the project brings? What is the main lesson learned from this story? Does the story describe a key insight on what works and what doesn't and something that future projects could build On	Yes	-
3.	Does the story describe the outcomes the project produced and the people who are benefitting? What changes-in skills knowledge, attitude, practice, or policy-has the project brought about and who is benefitting from these changes?	Yes	-
4.	Does the story make a compelling point that people will remember? Does the story show how the project makes a difference to improving livelihoods and lessening poverty?	Yes	-
5.	Does the story provide an interesting fact that people will remember? For example, how yields increased, how many hectares of land could become more productive from this innovation or technology?	Yes	-
6.	Does the story explain what kind of impact this innovation or technology could have if scaled up?	Yes	-
7.	Does the story show which partners contributed and how?	Yes	-
8.	Does the story include quotes from stakeholders or beneficiaries?	Yes	-
9.	Have I provided links to other media (journal articles, website news, newsletter, blogs, and annual reports of other programme/project) that also feature this story?	Yes	-
10.	Have I provided the contact details of people who can provide more information?	Yes	**-**