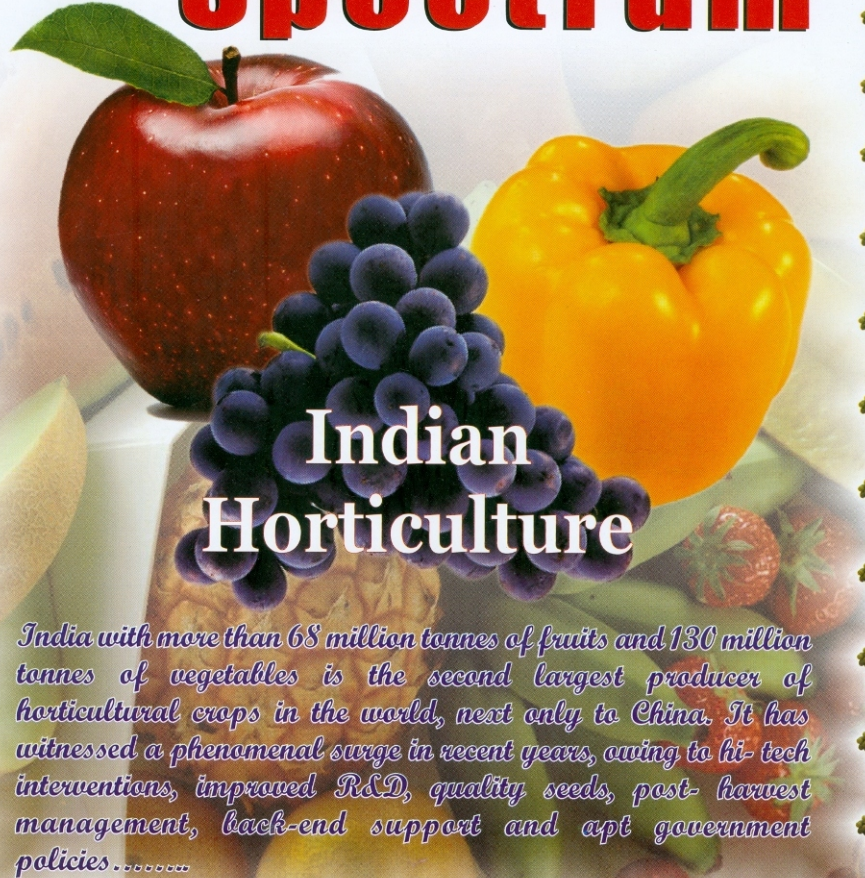


Horticulture Special Issue

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Agricultural Spectrum



Indian Horticulture

India with more than 68 million tonnes of fruits and 130 million tonnes of vegetables is the second largest producer of horticultural crops in the world, next only to China. It has witnessed a phenomenal surge in recent years, owing to hi-tech interventions, improved R&D, quality seeds, post-harvest management, back-end support and apt government policies.....



Tamil Nadu Precision Farming Project A Model Farmers' Corporate

Dr.E. Vadivel, Ph.D.,

Tamil Nadu Precision Farming Project is a turnkey consultancy Project for Tamil Nadu Agricultural University, Coimbatore, and was the first of its kind among Indian Agricultural Universities. It was a State's mega demo in 400 ha to be implemented in farmers holdings with a business component of consultancy fee to University and a condition to enhance the productivity of crops by 40-50 percent. The scientists have accepted the challenging task of being in the field and raising the first crop by themselves while the farmers and the extension workers were participating as trainees. Subsequently, for crops raised by the farmers for the next three years, the scientists have extended technical support. The project was awarded to TNAU on competitive bid basis and the highest quote was Rs.17.50 crores by an overseas firm while the lowest quote of the TNAU was Rs.7.20 crores of which Rs.43.00 Lakhs was made available as balance after completion of the project.

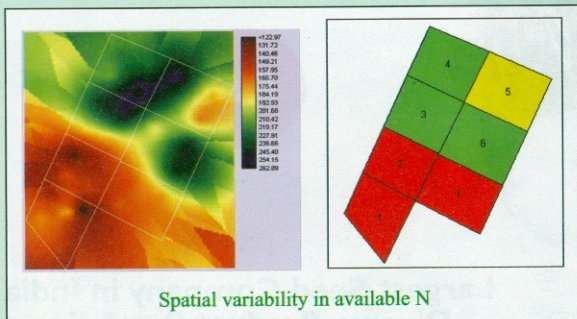
Processes matter

There were three partners, viz., TNAU, State Department of Horticulture, and Farmers and there was a tripartite agreement defining the responsibility of each; The District Administration shall identify the beneficiary farmers with the help of State Department of Horticulture. The TNAU, as the implementing agency, shall undertake the cultivation of crops; The State Department staff

and farmers had to undergo hands on training. The farmers within 20-30 km radius in the block have been brought under a cluster and each cluster was registered under Societies Act. The cluster served as the platform for all kinds of interactions, transactions, and functionally like a commodity group. Within TNAU, there was a Co-ordination Committee, Technical Committee, and separate Purchase Committee. About 20 scientists were physically in the field to cover 100 ha during the first year(2005-06), 200 ha during the second year(2006-07), and 100 ha during the third year(2008-09)

Technologies and Precision elements

The prime technologies adopted were remote sensing and GIS, chisel plough, Community shade net pro tray nursery, Crop geometry, Drip and Fertigation, IPM and PHM. 'Precision Farming' means predominantly the variable rate of fertilizer application for each sub cubic centimeter of soil in



Spatial variability in available N

the temperate countries where all other cultural elements are almost precisely accurate under highly mechanized system and need little attention. Further, the slow soil weathering process and winter cum autumn for six months in a year favour moderately homogenous soils in temperate regions, hence, GIS and Remote sensing could be appropriately applied for full advantage; where as in tropical countries like India, the seasonal variations are extreme, soil profile is kaleidoscopic, fertility and physical and chemical characters are extremely varying in every kilometer, hence, GIS and Remote Sensing technology has got limited use.

There are vital elements like soil preparation, nursery, crop geometry, nutrition, regulation of growth, flowering, fruiting, plant protection, support systems, post harvest management, capacity of individual farmers that have offered tremendous scope to make it precise. The accumulated effects of such precise application of technologies could contribute for enhancing the productivity.

Measurable outcomes

Productivity had enhanced up to 60-80% in 45 kinds of agricultural and horticultural crops raised so far. In the case of brinjal, an amazing yield of 500 MT/ha in duration of 16 months was recorded. Sugarcane yielded 250 MT/ha, Banana 200 MT/ha; 90-95 percent of produces were of first quality; in fact, Safal Market in Bangalore had to introduce a new 'Super Grade' over and above the 1st grade for bananas from precision field. Sago industries started paying Rs.50.00 extra per bag because of 30 percent Starch content. The produces enjoyed Premium Price in all the markets owing to the extended shelf life and eventually emerged as 'Precision Farm Brand'

produces.

The weight of produce per unit volume was 25 percent more. It had attracted the retailers who buy by volume and sell by weight, as there were double advantages. The extended harvest in precision crops made the produce available during lean seasons into market, which fetched double the price many a times.

Water economy (30-40%) and electricity economy (50%) were very much visible; The farmers are able to take up sowing right in the season with little irrigation water available in the wells even if monsoon rains get delayed. The dependence on labour was less and this was greatly enjoyed by every farmer when they were

relieved from the problem of acute labour shortage. Instead of five weeding, two weeding were adequate; even for one weeding, the number of labour required was only two thirds.

There was *technical empowerment* in that not only the farmers, but also the farm women and workers had developed expertise in activities like Protray nursery, fertigation, crop geometry, IPM and PHM. There were instances when farmers themselves refined the technologies to suit their specific needs. There was *economic empowerment* (minimum net profit one lakh/ha and maximum Rs.8.50 lakhs per ha) due to the higher production and successful marketing strategies adopted and equally there was *social empowerment* as they have become resource farmers not only to train 40,000 fellow farmers within the state, but also several thousand farmers from other states. Two precision farmers have become permanent resource farmers for NIRD and MANAGE Hyderabad. The Cluster level association efforts have drawn the attention of all development agencies in the district like the panchayat, district administration, banks, and line departments.

Scale up of the project

With the support of NADP (RKVY) funding from 2007-08 up to 2010-11, an area of 45,000 ha was brought under Precision Farming Project in Tamil Nadu State. As each farmer was allotted one unit only (one ha), almost all the farmer have extended the Precision Production System with their own investment for



the rest of the land they possessed and also availed the subsidy under micro irrigation scheme. Many of the projects are *subsidy driven* and few are *technology driven*; but the Precision Farming Project became the first project to be termed as *farmer driven*.

Beyond production into market

The farmers were taken an exposure visit to markets like SAFAL, Cochin, Chennai, Azad Nagar market, New Delhi, Pune, and Nasik to get them sensitized on market forces. Repeated buyer seller meet conducted during the tenure of the project sensitized the farmers on all issues of Supply Chain Management. Based on the learning on SCM, the cluster level associations took the responsibility of collective buying of inputs and collective bargaining of the price for the produce at various markets. A corporate firm 'Dharmapuri Precision Farmers Agro Services Ltd and Erode Precision Farm Producers Company Ltd' to deal with trading quality inputs for farmers have been incorporated by the initiatives of the Farmers; A new corporate firm 'Tamil Nadu Precision Farmers Producers Company Ltd' was incorporated under Company's Act exclusively to take up marketing of the farm produce on all four lane roads of the state with branding of the produce.

Thus, the peasant farmers are now shareholders of Ltd Company. They conduct AGM and plan for better marketing like a Corporate. The virtues of corporate have been transferred on to the peasant farmers and, in the real sense we can call the project as **Farmers Corporate**. The London School of Economics had studied the project and termed it as *India's Second Green Revolution*. The Union Planning Commission has identified the project as flagship project for extending to all other states in India.

Expertise started and Experience gained

Compared to expertise shared from University to the farmers, the experience gained by the Scientists was higher in dimension. The integration of technology and traditional wisdom had really paid the dividend.

- a. The TOT process has three integral elements, viz., Technology, Transfer mechanism, and the user (farmers). Since the implementation of the First Five year plan, the policy and budget support were much for the first two elements and the third element, (the farmers) the issue of capacity building of the farmers had



received no attention at all. The success of Precision Project was made possible simply by repeated interactions with the farmers rather than the technology and extension *per se*. The social capital, the farmers have accepted the Scientific Community as '*God Fathers*' and developed an emotional and moral linkage with the University.

b. Research Methodologies

The technologies from different disciplines of agriculture were efficient individually but when they were blended in the real field situations, hardly 30 percent of technologies synergized. Hence, a message was communicated to the research community that multi disciplinary and farmer participatory research programmes alone could deliver relevant and blendable 'technology package' to the farmer and time is not too far when farmers are to ask for '*Customized*



and Packaged technology' for each situation, crop, and variety rather than individual technologies. The *technology use efficiency, input use efficiency* and farmers' *managerial efficiency* are to be attended simultaneously; only then can the expected growth rate in agriculture be enhanced beyond the magic percent of four across the country. In this context, the role of the scientists needs to stretch beyond research and into development. The developmental focus of the scientist and extension workers is the need of the hour as experienced through the Precision farming Project over five years.

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