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AGROFORESTRY WILL RECEIVE A MAJOR THRUST

Shri Nitish Kumar, Union Agriculture Minister, Krishi Bhawan, New Delhi

Addressing a press conference on Agriculture Policy in New Delhi on 28 July, 2000, Shri Nitish Kumar, Union Minister for Agriculture said that since independence, Indian agriculture has made rapid strides and has contributed significantly in achieving self-sufficiency in food and in avoiding food shortages in our country. At the same time, agriculture has also become a relatively unrewarding profession due to generally unfavourable price regime and low-value addition causing abandoning of farming and increasing migration from rural areas. Despite having achieved national food security the well being of the farming community continues to be a matter of grave concern for the planners and policy-makers in the country.

The Agriculture Minister said the National Policy on Agriculture seeks to actualize the vast untapped growth potential of Indian agriculture, strengthen rural infrastructure to support faster agricultural development, promote value-addition, accelerate the growth of agro-business, create employment in rural areas and secure a fair standard of living for farming and agricultural workers and their families, discourage migration to urban areas and face the challenges arising out of liberalization and globalization.

The agriculture policy aims at a growth rate in excess of 4% per annum in agriculture sector, growth with equity; growth that is demand driven and caters to domestic markets and maximises benefits from export of agricultural products; growth that is sustainable technologically, environmentally and economically. The government accords priority to improving the quality of the country's land and soil resources, reclamation of degraded and fallow land as well as problem soils and will optimize their productive use.

Shri Nitish Kumar said that national

utilization and conservation of the country's abundant water resources will be promoted. Management of land resources on watershed basis will receive special attention. The use of biotechnologies will be promoted for evolving plants which consume less water, are drought and poor resistant, contain more nutrition, give higher yields and are environmentally safe.

Agroforestry and social forestry are prime requisites for maintenance of ecological balance and augmentation of biomass production in the agricultural systems. Agroforestry will receive a major thrust for efficient nutrition cycling, nitrogen fixation, organic matter addition and for improving drainage. Special efforts will be made to raise the productivity and production of crops to meet the increasing demand for food generated by unabated demographic pressures and raw materials for expanding agro-based industries.

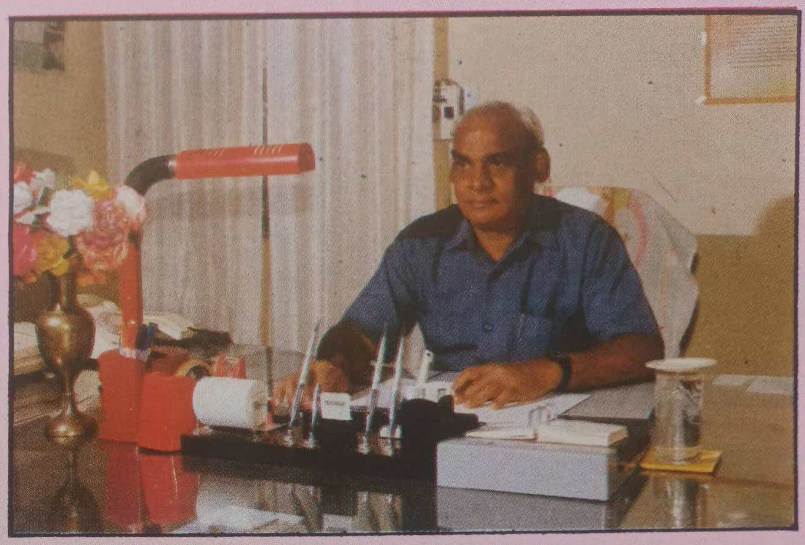
A major thrust will be given to development of rainfed and irrigated horticulture, floriculture, roots and tubers, bee-keeping and sericulture for augmenting food supply, exports and generating employment in the rural areas. Development of animal husbandry, dairying and aquaculture will receive a high priority in the efforts for diversifying agriculture, increasing animal protein availability in the food basket and for generating exportable surpluses. Generation and dissemination of appropriate technologies in the fields of animal production as also health care to enhance production and productivity level will be given greater attention.

Shri Nitish Kumar said that a high priority will be accorded to evolving new location specific and economically viable improved varieties of agricultural and horticultural crops, livestock species and aquaculture as also conservation and judicious use of germplasm and other biodiversity resources. The research and extension linkages will be strengthened to improve quality and effectiveness of research and extension system. Adequate and timely supply of quality inputs such as seeds, fertilizers, plant protection chemicals, bio-pesticides, agricultural machinery and credit at reasonable rates to farmers will be the endeavour of the government.

In order to protect the interest of farmers in context of removal of quantitative restrictions continuous monitoring of international prices will be undertaken and appropriate tariffs protection will be provided. A conducive climate will be created through a favourable price and trade regime to promote farmers own investment as also investments by industries producing inputs for agriculture and agro based industries. Rural electrification will be given a high priority as a prime mover for agricultural development. Emphasis will be laid on development of marketing infrastructure and techniques of preservation, storage and transportation with a view to reducing post-harvest losses and ensuring a better return to the grower. Endeavour will be made to provide a package insurance policy for the farmers, right from sowing of the crops to post harvest operations, including market fluctuations in the prices of agricultural produce. The government will continue to discharge its responsibility to ensure remunerative prices for agricultural produce.

The agriculture minister said that the National Agriculture Policy will receive the fullest support of all section of the people and lead to sustainable development of agriculture, create gainful employment on a self-sustaining basis in rural areas, raise standards of living for the farming communities.

From the Director's Desk.....



Agriculture, being the backbone of India's economy, is and will continue to be central to all strategies for planned socio-economic development of the country .In taking the annual food grains production from 51 million tonnes of the early fifties to 206 million tonnes at the turn of the century , it has contributed significantly in achieving self sufficiency in food and in avoiding food shortages in our country. The National Agriculture Policy-2000 seeks to actualise a growth rate in excess of 4 percent per annum in agriculture sector. In addition to the enhancement of growth rate it also states that growth that is based on efficient use of resources and conserves our soil, water and bio-diversity and growth that is sustainable technologically, environmentally and economically. The National Forest Policy (1988), on the other hand, sets a goal to have a minimum of one third of the total area of the country under forest or tree cover. This means that about 100 million ha should be covered with forest tree cover. For achieving this target, about 43 million ha (100-57.21 =42.79) area has to be regenerated/afforested.

Thus to attain the dual targets of agriculture production as well as forest cover, agroforestry by virtue of its very nature of combining trees on crop lands, serves as a viable option. It is because of this fact that National Agriculture Policy-2000 has nicely focused agroforestry and recognises, agroforestry and social forestry as prime requisites for maintenance of ecological balance and augmentation of biomass production in the agricultural systems. For practicing sustainable agriculture the policy envisages implementation of agroforestry in irrigated, rainfed and shifting cultivation areas. The policy also stresses greening of wastelands by adopting appropriate afforestation models.

The policy specially emphasizes that agroforestry will receive a major thrust for efficient nutrient recycling, nitrogen fixation, organic matter addition and for improving drainage. The policy features and stresses on: Reclamation of degraded and fallow lands as well as problem soils to optimize their productive use; Integrated and holistic development of rainfed areas by conservation of rain water by vegetative measures on watershed basis and augmentation of biomass production through agro and farm forestry ; Areas of shifting cultivation will receive particular attention for their sustainable development; Utilising wastelands for agriculture and afforestation.

Thus to be in tune with the proposed National Agriculture Policy-2000 , that endows teeming trust to agroforestry, emphasis has to be pitched on research for promoting vogue agroforestry

models for nitrogen fixation, organic matter addition and efficient nutrient recycling. Even, according to agriculture policy, the farmers will be encouraged to take up farm /agroforestry for sustainability of resources in addition to higher income generation by evolving technology, extension and credit support packages and removing constraints to development of agroforestry.

This is a colossal task and to accomplish it integrated efforts are required from agroforesters, farmers and policy makers. It also involves lot of funds not only from government side but also from private side and Non Government Organisations. Even the government policies have to be muffled so that incentives for agroforestry will be brought at par with incentives for crop production. A concerted effort of research and extension workers and the ultimate beneficiaries i.e peasant community may persuade to blooming accomplishment of this gargantuan endeavor.

K.R. Solanki

(K.R. SOLANKI)

Perspectives, Issues and Needs of Tree Growth Modelling

In principle, growth/yield models should allow generalization to emerge from limited amounts of field evidences. However, models rely heavily on parameters and on empirical relations that are subjected to errors and uncertainties, rarely quantified and therefore commonly ignored. Models should, therefore, be rigorously tested in field to predict accurately; for example by predicting how yield/growth will respond to species, spacing and management. In most tropical environments, growth/yield might reduce or enhance in many ways that are hard to model but impossible to ignore if predictions and measurements are to be reconciled.

A cental tree growth modelling effort in forestry/agroforestry can be seen as a means of achieving several important tasks :

- *synthesizing experimental and conceptual information* to understand the complex growth process in mathematically tractable form;
- *extrapolating research results* to new combinations that are too numerous to be studied with field experiments;

- **experience suggest that successful testing of a model in the relevant environment should always precede its exploitation to stabilise model efficiency**
- **to evolve models that may lead to optimum predictions, it is necessary to marshal information across disciplines and institutions**

- pinpointing and prioritising *gaps in knowledge* ;
- providing *decision support* to policy makers, researchers and extension staff.

These are particularly important because to evolve models that may lead to optimum predictions, it is necessary to marshal information across disciplines and institutions. It is the need of the time to concentrate on modelling efforts, which provides an intuitive means for researchers to develop and implement models and for other people to modify and use them. This potentiality provides a powerful basis for sub-models to be

exchanged and combined amongst researchers and institutions and could improve the efficiency with which interdisciplinary results of research are made available to assist in decision support and problem solving.

Concentration on the central development of one or two agroforestry practices for widespread adaptation and dissemination has been superseded by the facilitation of local development of tree resources at field, farm and landscape scale. Successful developments have generally involved a large number of locally available tree species, encouraged by farmers in various niches within their farms, building up at a landscape scale to the development of mosaics of complex and bio-diverse agroforestry practices. User-friendly models can help in training extension workers so that they easily ,understand this complexity in space and time. Connecting a central modeling effort to research and extension networks, with specific regard to making outputs available in suitable forms, has the potential to help extension staff understand which particular forestry/agroforestry interventions are valid for particular locations and farmer's objectives. This represents a significant step away from disseminating 'best-fit' agroforestry designs that may be inappropriate, towards supporting farmers in incorporating trees more flexibly within their farming systems.

Although foresters/agroforesters have invested much efforts and ingenuity in tree growth/ yield modelling, most of their predictions remains to be rigorously tested in field trials/conditions that deliberately reintroduce the protocols of traditional science. 'Rigorous' in this context means over several years and in different environments where it is intended to apply the model subsequently. It is agreed that there is very little evidence that testing on this scale has been attempted or even planned, presumably because it would be not only very expensive but also time consuming. However, both common sense and experience suggest that successful testing of a model in the relevant environment should always precede its exploitation to stabilise model efficiency. It amounts to confirm the refinement of a model ('estimation' and 'validation' in a nested manner) before its release.

To summarise, it is believed that although ingenuity and persistence has enabled modellors to make impressive progress over the last decade, major challenges still lies ahead: to account quantitatively for the uncertainties in the model predictions that are an inevitable consequence of uncertainties in inputs; to use models for predicting potential yield/ growth; to compare potential and actual yield/growth and to account for differences between them. In such tasks and in many other problems still ahead both in field and in computer room, much efforts, ingenuity and enthusiasm will be needed for success.

Ajit, V.K. Gupta and K.R. Solanki
National Research Centre for Agroforestry, Jhansi

Institute Joint Staff Council : Meeting of Institute Joint Staff Council was held on 23.10.2000 under the Chairmanship of the Director .

Field SRC : The field SRC was held during 14-16 and 19 December, 2000 under the chairmanship of Dr. K.R. Solanki ,Director ,NRCAF, Jhansi. Field SRC was attended by all Scientist .

Air Layering in *Hardwickia binata* : A Technique for Multiplication of Elite Trees without Genetic Drift

Hardwickia binata Roxb. of sub family Caesalpinaceae under the family Leguminacae, commonly known as Anjan, is a moderate to large sized tree and is distributed in isolated patches and blocks on varying soil types in the drier parts of India. It especially grows best on deep reddish gravelly loam soil. It is generally evergreen with graceful drooping slender branchlets and dark green coriaceous bifoliate leaflets which provides good quality fodder. Its wood is hardest, heaviest and an excellent source of fuel and charcoal wood. The bark produces a red brown fibre which is used to make ropes. As this species has highly straight bole with close canopy, it is considered to be one of the best species for agroforestry systems. However, this wonderful multipurpose tree has certain limitations in its life style *viz.* fruit formation generally starts at the age of 10 years or even more, sparse fruit formation to some extent every year but gregariously on an average of every 3-5 years according to climate/locality, pollination behavior is not known, natural germination is not so good and depends on some factors, dying back of seedlings, poor capacity of regeneration, not good coppicer, etc. Vegetative propagation techniques including micro propagation techniques are discouraging. Reported techniques for regeneration in this species is direct seed sowing in poly bags followed by transplantation in the field. Taking into view of these limitations especially where there is an importance to maintain genetic purity of elite trees and germplasm, necessity is found for regeneration through vegetative propagation. To achieve this goal, air layering may be a good achievement to overcome these hurdles as well as to maintain genetic purity of germplasm.

Techniques used for air layering

About 2.0-2.5 cm length of bark was scalped out around the axis of a healthy side dropping branchlets having 0.5-1.5 cm diameter in 10 years old plants. Different concentrations and combinations of IBA hormone solutions were prepared in 3% agar medium and applied separately on such debarked area in February, May, August and November for last two years (1999-2000). The treated branches were covered with moist moss grass (*Sphagnum sp.*) and wrapped with plastic ribbon of two inches width thereafter. Doses of treatments were (i) 500 ppm, (ii) 800 ppm, (iii) 1000 ppm, (iv) 1000 ppm IBA+500 ppm kinetin (2:1v/v),(v) 1000 ppm IBA+500

ppm kinetin (2:1 v/v)+vitamin B-complex (50 ppm) and (vi) distilled water as control. Each dose was applied on 20 branchlets. After rooting, the rooted branches were detached from mother plants. Tips of rooted branches were cut-off leaving a length of the branch 30-40 cm and after waxing the upper cut ends the same were transplanted in pots with standard sand : soil mixture (1: 1).

It is mention worthy that the experiment conducted in the months of August, November and February, had no callusing or rooting in the treated branches. Experimental findings in perspective of last two years suggested that high temperature with optimum humidity used to play very important role as evident from good rainfall in June-July unlike previous years. 800 ppm IBA gave poor callusing (40%) as well as rooting (10%). 1000 ppm IBA registered good callusing (90%) but did not show rooting capability accordingly. Addition of 500 ppm kinetin with 1000 ppm IBA (2:1 v/v) promoted callusing and rooting upto 100% and 50% , respectively as well as hastens rooting (20-40 days). Vitamin B-complex in combination with IBA and kinetin gave rise to good and more vigorous callusing (100%) and ultimately 5% increase in rooting. This dose scored the highest performance of rooting (55%). 500 ppm IBA and distilled water treatments (control) made no difference. Survival in pots was 100% for each dose. In a nut shell, it is to be concluded that air layering technique in *H. binata* is found to be very important and efficient in multiplication of superior genotypes/plus tree and for improvement programme of this species.

V. K. Gupta, R.V. Kumar, A. Datta, S. Sharma, S. K. Verma and K. R. Solanki
National Research Centre for Agroforestry, Jhansi

ऑवला सप्ताह

राष्ट्रीय कृषिवानिकी अनुसंधान केन्द्र, झाँसी में ऑवला सप्ताह (20 - 26 नवम्बर, 2000) का शुभारंम्भ डा. के. आर. सोलंकी, निदेशक द्वारा किया गया। इसके तहत पहले दिन पत्रकार बन्धुओं का प्रक्षेत्र भ्रमण कराया गया। सर्वप्रथम डा. के. आर. सोलंकी, निदेशक ने पत्रकार-गणों का आह्वान करते हुये ऑवला आधारित कृषिवानिकी पद्धति के बारे में जानकारी दी तथा ऑवले की उन्नत किस्मों जैसे कंचन, कृष्णा, एन. ए. - 7 तथा चकैया का अवलोकन कराया। बुन्देलखण्ड क्षेत्र के लिये ऑवले को वरदान के रूप में बताया गया। इस पेड़ को बुन्देलखण्ड की राकड़, पथरीली तथा बेकार भूमि में उगाने की जानकारी मुहैया कराई गई। डा. राम नेवाज, वरिष्ठ वैज्ञानिक ने ऑवले की महत्ता पर प्रकाश डालते हुये बताया कि एक पेड़ से औसतन एक से सवा कुन्तल ऑवले की उपज प्राप्त होती है तथा साथ में रबी और

खरीफ की फसलों को भी उगाया जाता है। कार्यक्रम के संयोजक डा. आर. पी. द्विवेदी ने ऑवला सप्ताह की विस्तृत

(शेष पृष्ठ 9 पर)

राष्ट्रीय कौमी एकता सप्ताह

राष्ट्रीय कृषिवानिकी अनुसंधान केन्द्र, झाँसी में राष्ट्रीय कौमी एकता सप्ताह (20-26 नवम्बर, 2000) का आयोजन डा. के. आर. सोलंकी, केन्द्र के निदेशक की अध्यक्षता में हुआ।

कौमी एकता सप्ताह के अन्तर्गत विभिन्न कार्यक्रमों का आयोजन हुआ। दिनाँक 20 नवम्बर, 2000 को शपथ ग्रहण कार्यक्रम हुआ। 21 नवम्बर, 2000 को कवि सम्मेलन हुआ जिसमें श्री राम बाबू शर्मा, श्री उदय प्रताप सिंह, डा. आर. के. तिवारी, श्री अजीत तथा डा. करीमूल्ला ने अपनी-अपनी क्षेत्रीय भाषा में काव्य पाठ किया। 22 नवम्बर, 2000 को श्री आर. एच. रिजवी तथा डा. के. करीमूल्ला ने अल्पसंख्यक तथा अनुसूचित जाति/जनजाति के उत्थान एवं कल्याण के लिये विभिन्न कार्यक्रमों का ब्यौरा तथा भूमि आवंटन के बारे में जानकारी दी तथा अभी तक के सांख्यिकीय आंकड़े प्रस्तुत किये। 23 नवम्बर को संस्थान के आवासीय परिसर के बच्चों ने रंगारंग कार्यक्रम प्रस्तुत किये।

इस आयोजन की मुख्य अतिथि श्रीमती पाठक एवं विशेष अतिथि श्रीमती सोलंकी रहीं। उन्होंने संयुक्त रूप से पुरष्कार वितरण किया।

इस रंगारंग कार्यक्रम में कु. निधी यादव व कु. नीशू चौहान ने नृत्य व कविता पाठ में प्रथम स्थान प्राप्त किया। सांस्कृतिक कार्यक्रम का संचालन डा. आर. पी. द्विवेदी ने किया। 24 नवम्बर को श्रीमती उमा, कु. नीलम खरे तथा श्री राम बाबू शर्मा ने नारी का भारतीय समाज में योगदान तथा विभिन्न समस्याओं पर विस्तृत एवं सारगर्भित जानकारी दी। कार्यक्रम के अन्तिम दिन 25 नवम्बर, 2000 को पर्यावरण संरक्षण

पर डा. प्रसिद्धि राय, प्रधान वैज्ञानिक तथा डा. ए. के. बिसारिया, वरिष्ठ वैज्ञानिक ने विचार व्यक्त किये। निदेशक डा. के. आर. सोलंकी ने केन्द्र के सभी वैज्ञानिक, अधिकारी एवं कर्मचारी गणों का आह्वान करते हुये कहा कि कौमी एकता बढ़ाने के लिये अपने परिवार के सदस्यों को ऐसे संस्कार दें जिससे दूसरो को सम्मान दिया जा सके। कौमी एकता सप्ताह के संयोजक श्री नोने राजा बुन्देला, सहायक प्रशासनिक अधिकारी ने सभी के प्रति आभार व्यक्त किया।

Human Resource Development

1. Dr. K.R. Solanki, Director, attended Director's meeting during 11 - 12 October, 2000 at New Delhi.
2. Dr. K.R. Solanki, Director attended "Seminar on Aonla" on 20 October, 2000 at Pratapgarh.
3. Dr. K.R. Solanki, Director, attended "Second Biotechnological Conference" during 29 October-1 November, 2000 at New Delhi.
4. Dr. K.R. Solanki, Director, Dr. A.K. Bisaria, Sr. Scientist and Dr. Ram Newaj, Sr. Scientist attended "National Seminar on Agriculture Scenario - Challenges and Opportunities" during 11 - 12 November, 2000 at JNKV Campus, CAO, Gwalior.
5. Dr. R.V. Kumar, Scientist attended Winter School on "Advances in Hybrid Breeding of Crop Plants" during 25 September - 15 October, 2000 at PDKV, Akola, Maharashtra.
6. Dr. R.S. Yadav, Scientist attended 65th Annual Convention of ISSS during 27 - 30 December, 2000 at NBSS&LUP, Nagpur.
7. Sh. Ramesh Singh, Scientist attended Winter School on "Advances in Micro Irrigation Systems" during 11 - 20 December, 2000 at DWMR, Patna.
8. Dr. P. Rai, Principal Scientist attended "Review Meeting Progress for ACIAP Project CSI/95/129 on Stylosynthesis" during 4 - 5 December, 2000 at Hubli.

(शेष पृष्ठ 7 का)

जानकारी दी तथा यह बताया कि बुन्देलखण्ड क्षेत्र के किसानों को रोजाना केन्द्र के प्रदर्शन प्रक्षेत्र पर भ्रमण कराया गया तथा किसान भाइयों से आह्वान किया कि ज्यादा से ज्यादा संख्या में भागीदारी करके इससे होने वाले लाभ को अर्जित करें। अन्त में कार्यक्रम संयोजक ने पत्रकार बन्धुओं का आभार व्यक्त किया। कृषक परिवारों ने खेत के बीच में ऑवला देखकर आश्चर्य व्यक्त किया तथा अपने खेतों में तथा खेतों की मेंड़ों पर ऑवला लगाने के लिये इच्छा व्यक्त की। ऑवला सप्ताह के दौरान किसानों में ऑवला आधारित कृषिवानिकी के बारे में जागरूकता एवं ज्ञान में इजाफा हुआ तथा उन्होने भविष्य में प्रशिक्षण कार्यक्रम में आने की इच्छुकता दिखाई।

Visitors

- Dr. R.S. Prasad, Finance Advisor, DARE, ICAR, Krishi Bhavan, New Delhi.
- Dr. V.P. Gupta, Vice Chancellor, RAU, Pusa, Bihar.
- Dr. V.K. Mishra, Executive Director, SPWD, New Delhi.
- Dr. S.K. Arora, Ex. Dean, College of Basic Sciences, HAU, Hisar.
- Dr. R. Deb Roy, Ex. Director, NRCAF, Jhansi.
- Press Reporters and Farmers from near by villages visited the Centre during Aonla week.
- Five ARS probationers from NAARM, Hyderabad visited the Centre under F.E.T. programme.
- Twenty five Officer trainees from CSWCR&TI, Dehradun visited the Centre.
- Educational tour of RLPS, Jhansi with 6 faculty members and 45 children visited the Centre.

Zonal Sports

A contingent of 32 players participated in ICAR Zonal Sport Meet (Zone-IV) held at IGFRI, Jhansi during 14 - 18 November, 2000 and Sh. Attar Singh got first prize in cycle race and in Badminton team event Dr. Anil Kumar, Dr. R.V. Kumar, Dr. K. Kareemulla, Sh. R.H. Rizvi and Dr. D.B.V. Ramana got second prize.

Supervision and Guidance : Dr. K.R. Solanki, Director, NRCAF, Jhansi

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A. K. Bisaria	**Director**	**Mini Printers**
Ajit	N.R.C.A.F., Jhansi	Antia Talab Road
A.K. Handa	Ph. : +91 - (0517) - 448213	Jhansi-284002
Rajeev Tiwari	Fax : +91 - (0517) - 442364	✆ : (0517) 446820, 447831
	E.mail : nrcaf@hub1.nic.in	