



# Prosperity through Diversification in Agriculture

## Proceedings

Organized Jointly by:

## Haryana Kisan Ayog

National Dairy Research Institute  
Indian Council of Agricultural Research  
International Maize and Wheat Improvement Centre  
Protection of Plant Varieties and Farmers' Rights Authority  
Lala Lajpat Rai University of Veterinary and Animal Sciences  
Department of Animal Husbandry, Haryana  
Department of Agriculture, Haryana  
Department of Horticulture, Haryana  
Department of Fisheries, Haryana

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On

**December 22-23, 2012 at Karnal (Haryana), India**

**Haryana Kisan Ayog**

Government of Haryana

CCS Haryana Agricultural University Campus

Hisar- 125004

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## **Seminar on Prosperity through Diversification in Agriculture**

### **Introduction**

Haryana has been a major contributor to the national food basket particularly rice and wheat despite very small acreage under farming. This has been possible due to introduction of high yielding cultivars of wheat and rice, creation of irrigation infrastructure, hard work of innovative farmers, and excellent policy support for promoting improved technologies in the State. However, the continuous monotonous rice-wheat cropping system has led to several second generation problems posing serious concerns on the sustainability of farming in the State which have major implications on the future food security of the country. The emerging challenges of depleting ground water resources, deteriorating soil health, volatility of energy and labour costs and growing climatic variability are intensifying the challenges. Therefore, alternate options for sustainable farming should be the top priority for agricultural research for development (AR4D) in the State. Keeping in view these challenges, a special seminar on “Prosperity Through Diversification in Agriculture” was organized jointly by Haryana Kisan Ayog (State farmers' commission), Indian Council of Agricultural Research (ICAR), National Dairy Research Institute (NDRI), State departments of Agriculture, Animal Husbandry, Horticulture and Fisheries, Govt of Haryana; International Maize and Wheat Improvement Centre (CIMMYT), Protection of Plant Varieties and Farmers' Right Authority (PPV & FRA) and Lala Lajpat Rai University of Veterinary and Animal Sciences (LLRUVAS) on December 22, 2012 at Karnal (Haryana). Nearly 1200 stakeholder including farmers, scientists, development officers of the State and private sector entrepreneurs participated in a day-long deliberation.

### **Inaugural Session**

The Seminar was inaugurated by Dr. R.S. Paroda, Chairman, Haryana Kisan Ayog (HKA) and was chaired by Dr. K.M.L. Pathak, Deputy Director General (Animal Sciences), ICAR. The other key persons present in the inaugural function of the

seminar were, Mr. Roshan Lal, IAS, Principal Secretary, Agriculture, Govt of Haryana, Mr. A.K. Singh, IAS, Director General (Agriculture), Govt of Haryana, Dr. K. D. Kokate, Deputy Director General (Agricultural Extension), ICAR, Dr. A. K. Srivastava, Director, NDRI, Dr. Indu Sharma, Director, DWR, Dr. D. K. Sharma, Director, Central Soil Salinity Research Institute (CSSRI), Karnal and Dr. R. S. Dalal, Member secretary, HKA.



The seminar was designed with three scientific presentations on the crop, horticultural and livestock diversification followed by sharing of experiences by innovative farmers on the respective thematic areas of diversification. Dr. M. L. Jat, Senior Cropping Systems Agronomist of CIMMYT



presented the issues under current farming situations of Haryana and their potential solutions with special emphasis on crop diversification through Conservation Agriculture (CA) based cropping system management practices. He pointed out that the results of a large number of farmers'

participatory field experimentations across the State suggest that CA based cropping systems management practices not only help to produce more with less water, energy, labour and cost but also restore natural resources health; adapt and mitigate climate change effects. Emphasizing the potential diversification possibilities, he highlighted that in many of the rice-wheat areas of Haryana where water table depletion is a serious concern, maize-wheat-mungbean rotation with CA based management is more profitable and sustainable option with 75-80 % saving in irrigation water. However, we need to have a holistic strategy of diversification that includes, cropping systems optimization, crop substitution, cropping system intensification, technology

diversification etc with their precisely defined potential domains and out-scaling strategies through greater synergies of programs, schemes, investments, institutional arrangements for knowledge sharing and enabling policy.

Dr. A. K. Srivastava, Director, NDRI presented the potential livestock diversification strategies emphasizing the contribution of livestock in agricultural GDP of the State. He also explained how it can further add value to the sustainability of farming systems and livelihoods in the State. In his presentation, he underlined the legacy of higher population of livestock in India, comprising 56.7% of buffaloes and 16% of cattle in the



world, and emphasized the need for further promoting poultry, sheep and goat production along with value addition as a part of diversification in livestock. He pointed out that (i) the problem of calf mortality in buffaloes and cattle can be tackled with good management practices including feeding of adequate colostrum to the new born calf, hygienic and comfortable shelter and providing good drinking water. (ii) For optimum reproduction and milk production, the first heat after parturation which normally appears in about a month, should be missed, the animal should be inseminated during the second heat and animal should be pregnant within 100 days of parturition. If the animal does not come into heat in 3 months, the veterinarian should be consulted. (iii) Piggery is also an option in the State for the farmers preferably in integrated farming system mode and among goat breeds; Beetal, Jakhrana and Barbari have good scope especially in the Mewat region.

For boosting milk production, Dr. Srivastava laid emphasis on fodder production, AI coverage, infertility management, feeding of mineral mixture and green fodder and feed blocks. He emphasized that the area under fodder production has come down to 5% from 12% at the time of independence while the population of livestock has doubled since then. He also emphasized that

rampant malnutrition in the children can be addressed by providing at least one glass of milk to every child during first 1000 days of life. Similarly, adequate nutrition of pregnant mothers is important for proper development of the foetus and healthy life of the child. Since livestock sector, particularly dairy, eggs and poultry meat have shown impressive growth rate of around 4,10 and 11 per cent respectively, it needs more budgetary support as against the present 1 per cent of the agricultural GDP, though livestock, poultry and fishery together contribute 28 to 30% of agricultural GDP at national level and 40 per cent in Haryana.

Dr. A.S. Saini, Additional Director (Horticulture) presented potential horticultural diversification options in Haryana. He summarized the major schemes that Govt of Haryana is implementing for horticultural diversification as well as intensification to cover more area under horticultural crops particularly in peri-urban areas as well as degraded and un-utilized lands.



Nearly 20 innovative farmers shared their experiences on crop, livestock and horticultural diversification using new technologies/approaches. The conservation agriculture remained the major focus during the discussion.

## TECHNICAL SESSIONS

### Technical Session 1: Crop Diversification- Experiences of Innovative Farmers

**Chair:** Sh. Roshan Lal  
Principal Secretary, Agriculture,  
Govt. of Haryana

**Co- Chair:** Dr. D. K. Sharma  
Director, CSSRI, Karnal

**Facilitator:** Dr. B. R. Kamboj  
CIMMYT, Karnal



Innovative farmers presented their views and rich experiences on diversification of agriculture. **Sh. Harpreet Singh** (farmer, village Beer Narayna, Karnal) shared his successful experiences about growing rice through Direct Seeded Rice (DSR) technology. He emphasized that DSR is a successful technique for water saving and for combating the problems of labour and electricity shortage in rice cultivation. He also pointed out that DSR is helpful in increasing the yield of succeeding wheat crop by 1 to 1.5 quintal per acre. He advised fellow farmers to take proper training and knowledge about package and practices of DSR before adopting it. He urged the scientists to explore/develop low cost and more effective weed management practices for DSR. He emphasized that under the uncertainties of weather due to climatic variability, the DSR crop tolerate more water stress than conventional till puddled transplanted rice and hence DSR is a risk management strategy. In the end Sh. Harpreet Singh necessitated more subsidies on the multi-crop zero till planter which is helpful to the farmers for more precise planting of different crops using the same machine and hence making better use of the machinery.

**Sh. Gurmail Singh** (farmer from Yamunanagar) stressed on intercropping in sugarcane systems for better profits and more efficient use of resources. He shared his experiences on intercropping in sugarcane systems and informed that sugarcane can be planted with wheat as intercrop in the end of October or in the beginning of November (autumn planting) with the help of raised bed planter at a distance of 90 cm. Based on his long experience on intercropping in

sugarcane, he recommended wheat, mustard, and gram for moderately big farmers while garlic, potato, onion and coriander as intercrops for small farmers. He stressed upon the need for mechanization in sugarcane cultivation. During the discussion, the custom services for sugarcane harvesting were emphasized.

**Sh. Harvinder Singh** (farmer from Kurukshetra) shared his recent experiences on cropping system intensification. He informed that rice-potato-spring maize is a highly profitable cropping system. With this crop rotation, he claimed to have harvested 42 quintals maize per acre. Sh. Singh also pointed out that there is a very good possibility of taking two maize crops and two potato crops in a calendar year, if maize is introduced in the system, and that will certainly add to the income of the farmers. He also opined that poplar cultivation with intercropping is a suitable way to conserve natural resources. Sh. Singh also shared his experience in the production of Murrah buffalo semen and found it a very profitable business for farmers.



**Sh Manoj Kumar and Sh Vikas Chaudhary** (farmers from Taraori, Karnal) shared their experiences about conservation agriculture and new model of adaptation and scaling-out of new technologies through Farmers Societies. They emphasized that conservation agriculture has the potential to raise the income of the farmers through curtailing the production cost, improving resource use efficiency and timeliness of operations. Sh. Manoj shared that sowing of wheat by turbo Happy Seeders in the loose rice residue is helpful in conserving water, soil and environment and also helpful in mitigating terminal heat effects. He also shared that growing berseem with wheat (Co-culture) and taking one cut for green



fodder at 55 days after sowing can fetch Rs 5000 per acre extra income to farmers and meet the green fodder requirements at lean period. These farmers explained in detail how they got attention from various agencies involved in agriculture by forming the Farmers' society. Sh Vikas shared his experiences on diversification of rice with kharif maize which was not only economically viable but also saved 90% water compared to rice. . He also shared his experiences on new tools and techniques (Nutrient Expert decision support tools, GreenSeeker etc) for precise nutrient management and improve productivity, profitability and nutrient use efficiency.

**Sh Ramesh Dagar** emphasized that market study is an essential tool to make diversification a successful business and advised the farmers to work in groups / farmer cooperatives. While sharing his experiences, Sh. Dagar explained that organic products can fetch 30 to 50 % more income to the farmers. He also suggested using the loose residue of rice to produce mushroom.

**Sh Anil Kamboj** explained that natural farming is helpful in reducing the use of chemicals in agriculture which helps in saving the environment along with raising the income of the farmers. Further, he told that JEEV AMRIT and BEEJ AMRIT can be used to grow high quality produce in agriculture.

### **Recommendations:**

**Key recommendations that emerged during the session on different topics are as follows:**

#### **Conservation Agriculture**

Conservation agriculture has demonstrated significant potential to address the emerging challenges of water, labour and energy shortages, deteriorating soil health, increasing cost of production and growing challenges of climatic variability.

Mechanization is necessary to overcome the acute labour problem. For this purpose the machinery should be provided on 90% subsidy to the farmer cooperatives to establish machinery banks and service windows.

Laser land levelling is a precursor technology for conservation

agriculture and the fields should laser levelled before adoption of conservation agriculture

Minimum 75 % subsidy should be provided on the multi-crop planter and turbo happy seeders.

The farmer Cooperatives and Societies can play a vital role in the dissemination of new technologies and knowledge through service windows and hence these should be encouraged for attracting youth in agriculture.

### **Rice- Wheat cropping system**

Direct Seeded Rice (DSR) is a successful technique to combat the problems related to scarcity of water, labour and electricity as well as adaptation to uncertain weather and erratic rainfall.

DSR has the potential of having equally good yield compared to conventional transplanted rice.

DSR saves about 25% irrigation water and tolerates more water stress compared to puddled transplanted rice

There is less incidence of Bakane/ Root rot disease in DSR as compared to puddled transplanted rice.

For better crop establishment of DSR, laser levelling is important.

DSR is also helpful in increasing the yield of succeeding wheat crop by one to one and half quintal per acre

Before adopting the technology proper training and knowledge about the package and practices of DSR is essential.

There is an urgent need to develop low cost and more effective herbicide molecules and integrated weed management practices.

In very light textured soils, DSR crop may suffer due to iron deficiency which can be corrected with the spray of Iron sulphate.

Zero tillage is helpful in conserving water, environment as well as reducing the cost of production in rice-wheat as well as other cropping system.

Residue burning can be avoided with use of turbo happy seeder but uniform spread of the straw is a must. For uniform spreading of straw, straw management system (SMS) attachment should be mandatory to all the combine harvesters.

Sowing of wheat by Turbo Happy Seeder in the loose rice residue is helpful in conserving water, soil and protecting environment with higher yield and income

To make the rice-wheat cropping system profitable, inclusion of short duration moongbean is a must and can be done either through relay planting or ZT situation using ZT planter.

### **Sugarcane based cropping system**

Sugarcane based cropping system can be made highly remunerative by intercropping sugarcane with cereals/oilseeds/pulses/vegetables.

Sugarcane should be planted during autumn (end of October or in the beginning of November) as an intercrop with wheat using raised bed planter. In this system, it was suggested to plant the sugarcane at a distance of 90 cm.

The sugarcane seed must be put in furrows and covered with light soil and then apply irrigation.

For good germination, the upper one-third portion of the 10 months old sugarcane plants should be used as seed.

The intercropped sugarcane + wheat give higher yields and income compared to wheat - sugarcane cropping sequence.

Wheat, mustard, and gram can be grown as intercrop in sugarcane by medium to large farmers while garlic, potato, onion and coriander are recommended as intercrops for small farmers.

For the sustainability of sugarcane cultivation, mechanization is necessary because of excessive demand of labour in harvesting, detrashing, loading and transportation.

Use of off-baring cum-fertilizer applicator machine in sugarcane ratoon can help in improving productivity as well as nutrient use efficiency.

## Cotton-wheat system

There is a large yield gap in wheat under cotton-wheat system compared to rice-wheat system due to delayed planting of wheat

Relay planting of wheat in standing cotton can increase the wheat productivity by 0.5 t/ha

Relay planting technology also helps in mitigating terminal heat effects, reduce cost of production and improve productivity of both wheat as well as cotton and hence higher profitability

Relay planting also address the issues of labour shortages at peak season

There is need to machinery for relay planting

## Crop diversification

Market study is an essential tool to make diversification a successful business.

Growing berseem with wheat and then cutting it at about 55 days can fetch Rs 5000 per acre extra income to the farmers besides addressing the issue of green fodder scarcity during extreme period.

To address the issues of water, kharif maize is a potential alternative to rice. There is tremendous water saving in kharif maize production compared to rice cultivation while having equal or better remunerations.

Permanent bed planting is a best crop establishment option for maize-wheat rotation

Farmers should work in groups. Self Help Groups and Societies work better than individuals.

Integration of Livestock with Crops can increase the income and serve as a source of income of farmers round the year.

Organic products can fetch 30 to 50 % more income to the farmers.

The farmers can earn extra income by grading and packaging the produce.

Rice straw is viable option for mushroom cultivation.

Rice-potato-spring maize is a highly profitable cropping pattern compared to conventional rice-wheat system. Maize yield levels up to 42 quintals per acre in spring season. However, precision in water management is a must.

For good residue management of spring maize, instead of ploughing in dry field one should go for harrowing by disc harrow followed by planking in the standing residue of maize. It will help in getting 3 to 4 quintal extra rice production per acre as well as saving of 3 to 4 irrigations.

If maize is introduced in the system, four crops can be taken in a year i.e. two maize crops and two potato crops can be grown successfully in a year in the field.

Poplar cultivation with intercropping is a suitable way to conserve natural resources.

## Soil Health

Conservation agriculture is a potential management strategy for improving soil health

Balanced plant nutrient management with Site-Specific nutrient management (SSNM) approach using Nutrient Expert decision support tools. Integrated nutrient management are helpful in improving soil health

Recycling crop residues and avoiding burning is a potential solution for improving soil health and mitigating GHG emissions

Natural farming is helpful in reducing the use of chemicals in agriculture which helps in saving the environment along with raising farmers income.

JEEV AMRIT and BEEJ AMRIT can be used to grow high quality produce in agriculture which can be sold up to three times higher prices.

## TECHNICAL SESSION- 2

### Horticultural diversification: experiences of innovative farmers

**Chair:** Dr. Satyavir Singh  
Director General, Horticulture,  
Govt. of Haryana.

**Co-Chair:** Dr. Malavika Dadlani  
Joint Director (Research), IARI

**Facilitator:** Dr. M. L. Chadha  
Consultant, HKA



In this session, four farmers made their presentations which were mainly based on their success stories.

**Sh. Kanwal Singh Chauhan**, a pioneer baby corn and mushroom farmer from district Sonapat, Haryana highlighted the importance of diversified and integrated farming. Dairying, bio-gas, bio-fertilizer, vermi-compost, hybrid seed production of baby corn and paddy are the main components of his integrated farming system. In 2004, he adopted mushroom and baby corn production. He also started utilizing mushroom compost. He has his own canning unit for baby corn, sweet corn, mushroom, broccoli, tomato puree and tomato ketchup. His system of farming is very unique and integrated in all aspects, starting from production, processing to marketing. His turnover increased from Rs. 35 lakh in 2009 to Rs. 72 lakh in 2010 and over Rs. 4 crore in 2012. In his attempt to help his neighbours, he purchases their produce at a premium over minimum support price for his processing unit. He gives better rate i.e. mushrooms Rs. 40/-, baby corn Rs. 50/- and sweet corn at Rs. 7-8 /- kg to the farmers under contract growing.

**Sh. Ramesh Chauhan**, a progressive farmer from district Palwal, Haryana highlighted the importance of aromatic crops. His crop diversification practices included growing of Mint and Lemon grass. He claimed that just in four



months, he earned Rs. 1 lakh from 1 acre of mint extracting 100 kg of oil from two cuttings. He was of the opinion that farmers can earn more profit by cultivating the non-traditional crops, as high value products can be developed from most of the non traditional crops. He expressed his concern that loan approval for a processing unit is taking long time, sometime over 2 years and suggested that banks should be persuaded to process the farmer's cases promptly.

**Sh. Dharamvir Singh**, a progressive farmer from Kurukshetra, Haryana, explained the importance of crop diversification. A paddy and wheat grower narrated that he visited Himachal Pradesh, with other farmers, to see the protected cultivation of vegetable crops. After his visit he started protected cultivation with the installation of 600 sq m green house receiving 50 % subsidy from the State Horticulture department. He earned Rs. 90,000 for two crops of cucumber in one year and now he has grown coloured capsicum. Sh. Singh said that he is very happy with the progress and will further increase the area under protected cultivation. He also listed the benefits of protected cultivation.

**Sh. Tara Singh**, a young farmer from Karnal District Haryana, emphasized the need for capacity building of insecticides/pesticides dealers of the State, as knowledge of these dealers must be up scaled to serve farmers better. He was of the view that no subsidy is needed if the profitable returns are assured to the farmers and agriculture gets the industry status. He opined that sometimes rates after subsidy are higher than the open market prices. He also referred to the big gap between the prices received by the farmers and paid by consumers, as the middlemen are taking away about 50 percent of the prices paid by the consumers.

### **Remarks of Chair**

In his concluding remarks, the chairman of the session, Dr. Satyavir Singh, congratulated all the speakers on sharing their valuable experiences on horticultural diversification. He emphasized that farmers face problems because of delay in getting loans, and this process need to be simplified. Based on the farmers' success stories, he was of the opinion that diversified farming is a hope to bring back the youths in agriculture.

## **Recommendations:**

**The following recommendations emerged from various presentations and suggestions made by the participants:**

1. There are problems in getting loan from Banks and they charge high processing fee for loan.
2. The provision for providing loan for setting agro-processing industry should not be linked with collateral security of agriculture land.
3. The excise duty charged in India on canned produce (12% + VAT) is not applicable in competing countries like Thailand/ Malaysia etc.
4. For processing industry, loan should be available at the rate of 4 %.
5. In order to help mushroom production in State, a mushroom processing unit should be established in Sonipat as Sonipat is the hub of mushroom production.
6. A full package of practices should be developed for organic farming and protected cultivation.
7. Aromatic crops like mint and lemon grass are very paying and their cultivation and processing need to be promoted.
8. Protected cultivation is a paying venture, as it gives 4-5 times yield, it should be promoted as youth is attracted back to Horti-business.
9. Training should be provided to input dealers especially to insecticides-pesticides dealers so that they can provide the right type of quality inputs to the farmers.

## TECHNICAL SESSION- 3

### Livestock diversification

**Chairman:** Dr. G. S. Jakhar  
Joint Director,  
DAH&D, Haryana

**CO-Chairman:** Dr. Suresh C. Arya  
Dean, LLRUVAS, Hisar

**Facilitator:** Dr. M.P. Yadav  
Consultant, HKA



Six progressive farmers from Haryana shared their views and experiences in this session.

**Shri Ramesh Dagar** opined that livestock is a very important component of organic farming. He said that he is selling organic milk at Rs 50.00 per kg which is almost double of regular market price. He said that he is adding value to the milk further by preparing butter and ghee and their marketing after proper grading, packaging, and labelling.

**Shri Vikash**, another farmer who runs a Society for conservation of natural resources and empowering rural youth, advocated the growing of dual purpose wheat for grain as well as for green fodder. He obtained 60 quintal fodder/acre at 55 day cut in mixed crop of wheat and berseem at his farm. He said that although there was Slight reduction in wheat grain yield in this method, but it is more than compensated through nitrogen fixation by berseem crop and increase in milk yield as well as quality of milk by feeding green fodder to animals. As practice does not require separate land for fodder production. The practice will make more land available for cultivation of other crops including cereals, vegetable and flowers etc.

**Shri Rajbir Singh**, a progressive dairy farmer from Karnal advocated for growing year round maize for fodder by obtaining up to three crops in a year. He also emphasized the need for breed purity and higher price for milk.

**Smt Kamlesh**, another progressive farmer from Karnal, informed about the

success story of a Self Help Group (SHG) for preparing Paneer and Khoya from milk. She said that each member of the SHG earns about Rs. 6000/- per month.

**Shri Ram Singh**, a farmer from Taraori having 100 cows, desired that in view of over flowing of wheat grain and wastage due to inadequate storage facilities, surplus wheat could be provided on subsidized rate for feed. He also suggested for treating dairy sector at par with “crop agriculture” for electricity rates. He emphasized the need for establishment of a research institute on indigenous cattle breed development. He further suggested that there should be incentives for rearing milch cow at par for buffaloes rearing, sexed semen should be available to the farmers, minimum one rupee increase should be made in milk price, 100% subsidy on silo pits, maize seed and maize cutter should be provided to the farmers on subsidy, and training should be given to the farmers in marketing.

**Shri Harvinder** shared his experience of earning Rs 400 from one straw of elite Murrah bull and establishment of semen bank by him through freezing. He informed that the semen is being supplied by him up to West Bengal.



**Shri Sultan Singh**, a progressive fish farmer from Karnal suggested for more subsidies in fishery, developing human resources, and addressing the problem of low water temperature, hindering the growth of fish during winter in northern India.

**Dr. K.M.L. Pathak** DDG, Animal Science, ICAR in his remarks earlier during the inaugural session emphasized the need for strengthening of research in animal reproduction and remunerative MSP for milk to the producers who sell their milk to the processing plants.



Dr R. S. Paroda, Chairman Haryana Kisan Ayog in his remarks advocated the need for initiating the “Livestock Mission” in the State which has already been approved in principle by the Haryana Government.

**Recommendations:**

**The following recommendations emerged from the above presentations and discussions:**

1. There should be provision for minimum Support Price (MSP) for milk, as the prices received by the milk producers are not remunerative considering the cost of milk production.
2. Awareness should be increased among livestock keepers regarding the importance of colostrum feeding to newly born calves/kids/lambs/piglets for reducing mortality rate in the young stock.
3. In order to enhance quality fodder resources and at the same time avoiding man- animal conflict for land use for growing grains and fodder respectively, dual purpose wheat variety and wheat with Berseem need to be popularized during the rabi crops, with early sowing and one cutting for fodder between 50-60 days after sowing.
4. To solve the problem of shortage of concentrates for livestock, surplus wheat in the granaries of the government after one year of storage may be diverted for animal feeding at subsidized rates.
5. Due emphasis should be given for infertility management in cattle and buffaloes.
6. Value addition to milk in the form of organic milk, healthy food, composite, Dairy food, butter or ghee making should be promoted along with market access for increasing farmers profits .
7. Backyard Poultry, Piggery, goat and sheep husbandry need due attention at policy as well as technology levels for their promotion in the State for livelihood and nutritional security.
8. Dairying and Fishery should be treated at par with crop agriculture and horticulture in respect of inputs, pricing, incentives and other facilities by the government.

9. The problem of lower water temperatures in fish pond in northern India during winter seasons, thereby restricting the growth of fish and permitting only one crop in the year, need to be addressed through appropriate R & D.
10. Male Murrah buffalo semen production has the potential of profitable business.
11. Research should be strengthened in the State for Indigenous cattle breed development.

## Plenary Session

Dr. R. S. Paroda, Chairman of Haryana Kisan Ayog chaired the plenary session and highlighted the fact that Haryana cannot sustain the benefits of green revolution unless we involve farmers in the research and development process. In this session, Dr. Paroda summarized the deliberations



made during the seminar and highlighted the need for diversification not only in crops and cropping systems but also in horticulture and livestock, along with their production/management technologies. While reiterating the issues of water, labour and energy shortages as well emerging challenges of climate change, he outlined the possible options and necessary policy support for scaling-up and scaling-out of those technologies. Real time access to information at farmer's door-step as well as linking farmers to market are the key factors for the required success in agricultural diversification. In his concluding remarks, Dr. Paroda mentioned that Haryana is ahead of other states in the country to have decided to have its "Agricultural Policy" for convergence & synergy of various programs, schemes and investments for prosperity of farmers, while conserving the natural resources and available agro biodiversity of plants and animals.

He highlighted that the productivity growth remained low, except wheat which has caught up from 4.6 tonnes to 5.2 tonnes/ha during the last 3 years. This has

been possible by involving farmers in crop management, such as timely planting, Conservation Agriculture (CA) soil test based nutrient application, seed replacement of HYV etc. He further said that the challenges are no longer for a top down approach. Many farmers have come out with good innovations. Some farmers are producing more yield than what is reported at the experimental farms. We have similar examples in fisheries, animal husbandry and horticulture, where farmers have contributed in terms of new innovations. He desired that the number of awards and the amount of awards for the farmers be increased to provide incentives for new innovations or new records. Based on the discussions, he summarized the following issues for an overall development of agriculture:

We need to move towards more sustainable cropping system in long-term. There is enough evidences that Green Revolution, started in mid-1960s, is being challenged by natural resource degradation, declining factor productivity and climate change effects. Therefore, we need to create a balance by introducing climate smart technologies, which may help in reducing costs on labour, fuel, water and inputs requirements and risk management to make farming resilient and improve profits of farmers.

Recent production increases have been primarily due to improvement in management practices. We, therefore need to lay greater emphasis on resilience in agriculture.

There is considerable scope for promoting kharif and spring maize, soybean, direct seeded rice and machine for transplanting of rice. There is also a need for inter-institutional efforts to address the issues of climate change and need to work with a change in perception from “crop commodity” based approach to cropping system's approach and an “integrated farming system” approach.

There are still several untapped opportunities that will help to create employment in agriculture. Diversification in dairying including the mission on Livestock and Animal Husbandry, post-harvest handling, agriculture machinery, and agriculture based industry, peri-urban farming, Agro-service centres for mechanization, direct purchase of machines from dealers and creating entrepreneurs among farmers and linking farmers with the market.

Women farmers have comparative advantage for ensuring household nutrition security through agricultural diversification. They are getting actively engaged in mushroom cultivation, animal husbandry, vermi-compost, post-harvest technologies and also in small business enterprises. They are playing an important role in farm management issues and can inject new dynamism in rural society provided empowered and encouraged. Women now represent a new opportunity, therefore women empowerment and their involvement in agriculture related decision making is very much needed. We also need to explore new ways by which women farmers can contribute more towards development of agriculture in the State.

Industries, especially of textiles, are increasing around major cities and in NCR region, but manufactures do not care about the pollutants and effluents that harm the agriculture. There should be emphasis on both the beneficial and harmful effects of such effluents for agriculture.

We need to create enabling environment to improve the profitability in farming and sustaining it. Haryana Kisan Ayog has prepared policy document and has given the roadmap for new initiatives that we need to take up. Farmers, in fact, need knowledge, proper market mechanism and remunerative price of their produce in view of increase in the cost of inputs.

Today's agriculture has new challenges, and to find proper solutions we need to have competent human resources and a proper balance between research and extension. We, therefore, need to develop technologies that suits better the need of farmers. For this, we need to promote participatory approach through involvement of farmers right from strategic planning to generation, refinement and adoption of new technologies.

Given the scale of the task, it has become all the more necessary to build public - private sector partnerships. We must also strengthen again partnership with International Agriculture Research System (IARS).

Dr. Paroda also highlighted that molecular breeding will continue delivering significant outcomes. We now need urgently new innovations. He also emphasized the need to lessen the risks such as: stresses like terminal heat, draught, and biotic stresses.

## Kisan Diwas Celebration

On the 110th birth anniversary of former Prime Minister of India, Chaudhary Charan Singh, a Kisan Diwas, being second in the series, was organized by Haryana Kisan Ayog in collaboration with ICAR, NDRI, CIMMYT, PPV & FRA, LLRUVAS and the State Departments of Agriculture, Animal Husbandry, Horticulture and Fisheries on December 23, 2012 at NDRI, Karnal (Haryana). Over 5000 farmers, scientists, development officers and other stakeholders participated in the Programme. Dr Bhupinder Singh Hooda, Chief Minister of



Haryana graced the occasion as Chief Guest, whereas Dr S. Ayyappan, Director General, ICAR and Secretary, DARE was the Guest of Honour and Dr. R.S. Paroda presided over the function. Dr Hooda along with other dignitaries first visited the Conservation Agriculture

field trials at KVK, NDRI, Karnal, managed jointly by NDRI and CIMMYT. Dr. M. L. Jat of CIMMYT explained the potential benefits of Conservation Agriculture (CA) based management practices and also about relevant CA machinery that need to be encouraged in the State. Hon'ble CM also inaugurated the exhibition of agri-technologies, wherein more than 50 organizations/institutions and innovative farmers showcased farmer friendly technologies.

Dr. R.S. Paroda, Chairman HKA, in his address, highlighted the major achievements of the Ayog and appreciated the support of the Hon'ble CM for accepting almost of the recommendations. The decision for their implementation will lead to inclusive growth in agriculture in the State. Dr. Paroda also highlighted the key recommendations of the seminar on "Prosperity through Diversification in Agriculture" emphasizing the need for diversification in a "farming systems mode", with emphasis on natural resource management as well as issues of climate change. In this regard, he specially cited some examples such as: conservation agriculture, direct seeded rice, laser

levelling etc. Dr. S. Ayyappan, emphasized that Haryana is a torch bearer in agriculture and contributes significantly to the bread basket of the country. He further highlighted the need of location specific diversification options in a holistic manner including field crops, horticultural crops, livestock, fisheries etc. He further stressed that shrinking farm profitability is an issue of concern. Hence, we should develop strategies for twin benefits of increasing productivity and reducing cost of production. There is need to link farmers to market and improve youth in agriculture through adoption of modern farm technologies. He appreciated the work of Haryana Kisan Ayog and considered it as a model for other states in the country to follow. Dr. Ayyappan assured full support of ICAR institutions for agricultural development and prosperity of Haryana farmers. Dr Arvind Sharma, MP from Karnal also graced the occasion and congratulated the farmers for their dedicated work to improve Haryana agriculture. Shri Roshan Lal, Principle Secretary Agriculture, Govt of Haryana highlighted the achievements of Haryana for its highest wheat productivity in the country.

In his eloquent address, Dr. Bhupinder Singh Hooda, Chief Minister of Haryana laid major stress on (i) sustainability issue of rice-wheat system in the state, (ii) depleting water table, (iii) deteriorating soil health and (iv) emerging challenge of climate change. To address these issues, he emphasized the need to replace rice with maize and soybean in some areas, direct seeding of rice, zero tillage in wheat and other crops, to stop residue burning and use turbo Happy Seeder for planting wheat, introduce short duration legumes like mungbean, raised bed planting and intercropping in sugarcane system, laser levelling, micro-irrigation, balanced plant nutrient management and also adoption of high value crops and protected cultivation in the peri-



urban areas. To promote these technologies, made announcement on doubling the subsidies on laser leveller, zero till planter, turbo Happy Seeder, multi-crop planter, raised bed planter and reaper. He was happy to learn about the progress on implementation of Conservation Agriculture action plan in the state. He appreciated and congratulated the excellent progress of HKA and assured that all the recommendations of HKA shall be accepted by the Govt. for the benefit of Haryana farmers. He felt proud that other states of India as well as other countries are keen to learn Haryana model. Dr. Hooda awarded 27 innovative farmers for their innovative efforts in technology adaptation and scaling-out. He also released the publications of Haryana Kisan Ayog and the Department of Horticulture and expressed his satisfaction on successful organization of Kisan Diwas at NDRI, Karnal.

## **FARMERS HONOURED ON KISAN DIWAS**

- |                                     |   |
|-------------------------------------|---|
| ▪ Sh. Kanwal Singh Chauhan, Sonipat | ▪ Sh. Surender Singh Hara, Yamuna Nagar |
| ▪ Smt. Birmati, Mahendragarh        | ▪ Sh. Ravinder Lakhanpal, Panchkula     |
| ▪ Sh. Ishwar Kundu, Kaithal         | ▪ Sh. Dipanshar Bhatia, Karnal          |
| ▪ Sh. Mahinder Singh, Kaithal       | ▪ Sh. Dharmvir Kamboj, Yamuna Nagar     |
| ▪ Sh. Manoj Kumar Munjal, Karnal    | ▪ Sh. Narender Singh, Panipat           |
| ▪ Sh. Vikas Choudhary, Karnal       | ▪ Sh. Hoshiyar Singh, Hisar             |
| ▪ Sh. Gurmail Singh, Yamuna Nagar   | ▪ Sh. Karamvir Singh, Kurukshetra       |
| ▪ Sh. Harvinder Singh, Kurukshetra  | ▪ Sh. Baljeet Reddu, Jind               |
| ▪ Sh. Harpreet Singh, Karnal        | ▪ Sh. Roop Singh, Jind                  |
| ▪ Sh. Gurbhajan Singh, Sirsa        | ▪ Sh. Jasbeer Deshwal, Jind             |
| ▪ Sh. Satish Saluja, Yamuna Nagar   | ▪ Sh. Ishwar Singh, Mahendragarh        |
| ▪ Sh. Jasbir Malik, Sonipat         | ▪ Smt. Nayab Kaur, Ambala               |
| ▪ Sh. Bijender Singh, Sonipat       | ▪ Sh. Sultan Singh, Karnal              |
|                                     | ▪ Sh. Jai Pal Singh, Jhajjar            |

## **“Prosperity Through Diversification in Agriculture”**

**December 22-23, 2012, Karnal, Haryana**

### **PROGRAMME**

#### **Day-1: 22<sup>nd</sup> Dec-2012: Seminar**

0900-0930	Registration	
0930-1100	Inaugural and <i>Thematic presentations on Issues, opportunities and action plan for diversification in Agriculture</i> Session	
	<i>Chief Guest : Dr RS Paroda, Chairman, HKA</i>	
	<i>Chair : Dr KML Pathak, DDG (Animal Sciences), ICAR</i>	
	<i>Co-Chair : Dr Indu Sharma, Director, DWR</i>	
	<i>Facilitator : Dr M.L. Jat, Sr Cropping Systems Agronomist, CIMMYT</i>	
0930-0935	Welcome	<i>Dr AK Srivastava, Director, NDRI</i>
0935-0950	Crop diversification	<i>Dr ML Jat, CIMMYT</i>
0950-1005	Horticultural diversification	<i>Dr Arjun Saini, Govt of Haryana</i>
1005-1020	Livestock diversification	<i>Dr AK Srivastava, NDRI</i>
1020-1025	Address by DG Agril. Haryana	<i>Mr AK Singh, IAS</i>
1025-1030	Address by DDG (Extension), ICAR	<i>Dr KD Kokate</i>
1030-1035	Address by Co-chair	<i>Dr Indu Sharma, Director, DWR</i>
1035-1040	Address by Chair	<i>Dr. KML Pathak, DDG, ICAR</i>
1040-1055	Address by Chief Guest	<i>Dr RS Paroda, Chairman, HKA</i>
1055-1100	Vote of thanks	<i>Dr RS Dalal, HKA</i>
<b>1100-1115</b>	<b><i>Tea Break</i></b>	
<b>1115-1210</b>	<b><i>Technical session-1: Crop diversification: experiences of innovative farmers</i></b>	
	<i>Chair : Sh Roshan Lal, Financial Commissioner, Govt of Haryana</i>	
	<i>Co-Chair : Dr DK Sharma, Director, CSSRI</i>	
	<i>Facilitator : Dr BR Kamboj, CIMMYT</i>	
1100-1115	Farmer-I: Rice-wheat system	<i>Harpreet Singh</i>
1115-1130	Farmer-II: Cotton-wheat system	<i>Shamsher Singh Sandhu</i>
1130-1145	Farmer-III: Sugarcane based system	<i>Gurmel Singh</i>
1145-1200	Farmer-IV: Crop diversification	<i>Ramesh Dagar</i>
1200-1215	Farmer-VI: Conservation agriculture	<i>Vikash &amp; Manoj</i>

1215-1230	Farmer-VII: Micro-irrigation/water management	Arvinder Singh/Anil
1230-1245	Farmer-VIII: Soil and crop health management	Harvinder singh
1245-1300	Open discussion and summary of discussion with key outcomes/action points	All
<b>1320-1400</b>	<b>Lunch</b>	
<b>1400-1515</b>	<b>Technical session-2: Horticultural diversification: experiences of innovative farmers</b>	
	<i>Chair : Dr. Satbir Singh, DG Horticulture, Govt of Haryana</i>	
	<i>Co-Chair : Dr. Dr Malvika Dadlani, Joint Director Research, IARI</i>	
	<i>Facilitator : Dr. M. L. Chadha, HKA</i>	
1400-1415	Farmer-I: Vegetables	Parmal Singh
1415-1430	Farmer-II: Fruits	Balbir Singh
1430-1445	Farmer-III: Specialty crops: baby corn, sweet corn, mushroom etc	Kanwal Singh Chauhan / Pawan Kumar
1445-1500	Farmer-IV: Floriculture	Lakhanpal/Ravinder Dahiya
1500-1515	Open discussion and summary of discussion with key outcomes/action points	
<b>1515-1530</b>	<b>Tea Break</b>	
<b>1530-1645</b>	<b>Technical session-3: Livestock for diversification: experiences of innovative farmers</b>	
	<i>Chair : Dr. G. S. Jakhar, DAH&amp;D</i>	
	<i>Co-Chair : Dr. Suresh C. Arya, Dean, College of Vety.&amp; An. Sc., LLRUVAS, Hisar</i>	
	<i>Facilitator : Dr. M.P. Yadav, HKA</i>	
1530-1545	Farmer-I: Livestock production	Rajbir Singh, Dadupur
1545-1600	Farmer-II: Dairy processing	Baljit Singh Redhu/Kamlesh
1600-1615	Farmer-III: Fisheries	Sultan Singh/ Susheel Kr (Kamalpur)
1615-1630	Farmer-IV: Poultry	Vikas, Bastana
1630-1645	Open discussion and summary of discussion with key outcomes/action points	

**1645-1800 Plenary session: Key recommendations of different sessions**

*Chair : Dr RS Paroda, Chairman, HKA*

*Co-Chair : Dr KD Kokate, DDG (Ext), ICAR*

*Facilitator : Dr R.K.Malik, CIMMYT*

1645-1655	Session-I	Dr ML Jat, CIMMYT
1655-1705	Session-II	Dr BR Kamboj
1705-1715	Session-III	Dr ML Chadha
1715-1725	Session-IV	Dr MP Yadav
1725-1740	Remarks of Co-chair	Dr KD Kokate
1740-1755	Remarks of Chair	Dr RS Paroda
1755-1810	Vote of thanks	Dr Suresh Gahalawat

**1830-2000 Cultural Program**

**2000-2100 Dinner**

**Day-2: 23<sup>rd</sup> Dec-2012: Field visit, Exhibitions and Kisan Diwas**

0900-1100	Visit to exhibitions and field demonstrations	DoA, CIMMYT, NDRI, CSSRI, DWR teams
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**1100-1130 Tea**

1130-1200	Highlights of Seminar (all the participants sit in the pandal)	
1130-1200	Inauguration of Exhibition by Hon'ble Chief Minister and field at NDRI-KVK ( <i>Parallel</i> )	Dr Bhupinder Singh Hooda

**Kisan Diwas Celebration and address of Hon'ble Chief Minister, Haryana**

1215-1220	Welcome of dignitaries	Sh Roshan Lal
1220-1235	Address by Chairman HKA	Dr RS Paroda
1235-1240	Presentation of reports to Honble CM and Plaques to Chairmen, WG	Hon'ble Chief Minister
1240-1255	Address by Guest of Honour	Dr S Ayyappan, DG ICAR
1255-1315	Distribution of awards	Hon'ble Chief Minister
1315-1335	Address by Hon'ble Chief Minister, Haryana	Dr Bhupinder Singh Hooda
1335-1340	Vote of thanks	Dr.A.K.Srivastava
1345-1430	Lunch	







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