



Sub Themes : VI  
Miscellaneous

## Problems Faced by Farmers in Using Indigenous Water Harvesting Practices

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Water harvesting is the process of collecting, conveying and storing water from an area that has been treated to increase the runoff of rainfall and snow melt. Water is major natural resource which is limiting factor in the development of agricultural product. Rajasthan is the largest state in India having about 11 per cent area of the county where water availability is only one per cent of the country. In north western Rajasthan particularly in Bikaner district the quantity of available water from various sources such as surface water and ground water are not sufficient even for drinking purpose. People in north western Rajasthan particularly in Bikaner district have been depending on Rain Water Harvesting Structure (RWH) which is the form of small ponds (Nadis) reservoirs under ground tank called Tanka or Nadi etc. In recent past traditional water harvesting systems started gradually disappearing due to environment degradation, over dependency, on the state and technological advance which led to easy exploitation of groundwater results is more scarcity of water in and around. A study was undertaken to find out the various impediments or problems faced by farmers in using Indigenous Water Harvesting Practices in two panchayat samities namely Bikaner and Kolayat and 120 farmers were selected from 10 selected villages of Bikaner district of Rajasthan. The finding of the study shows that socio-psychological (70.16 MPS) and technical constraints (64.33 MPS) were most important constraints among all the identified constraints viz., economic constraints, technical constraints, socio-psychological constraints, climatic constraints and general constraints which hinders the adoption of Indigenous Water Harvesting Practices. Among socio-psychological constraints “deterioration of water quality in Indigenous Water Harvesting Structure as a major problems expressed by the farmers with 81.94 MPS. The least important socio- psychological constraints perceived by respondents was “Negative approaches of the local leaders regarding IWHP” with 63.05 MPS. Where as in technical constraints the requirement technical skill for maintenance of IWHS is the most important constraints with 71.38 MPS and the least important technical constraints as perceived by the respondents was “Difficulty in making large catchments area for tanka” with 57.50 MPS. The heavy initial investment required for the construction of tanka is perceived as most important economic constraints by the respondents in adoption of IWHP. Whereas, “more water less in IWHS due to high temperature was important climatic constraint as perceived by respondents. The lack of motivating agency in area for adoption of IWHP was important general constraints as per respondents view. It was also recorded that the deterioration of water of quality in IWHS was a major problem faced by farmers. It was concluded that the socio-psychological constraints were perceived at the top priority by the respondents with 70.16 MPS, followed by technical constraints (64.33 MPS) and economic constraints on third ranks with (64.27 MPS). The climatic constraints and general constraints were given less priority by the respondents and were assigned fourth and fifth rank with 57.00 and 52.55 MPS, respectively. It was suggested that the availability of potassium permanganate and chlorine should be ensured in a rural areas to tackle the problem of deterioration of water quality.

## Traditional Feeding Practices of Dairy Animals and Chemical Compositions of Dairy Rations in Goa

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A study was envisaged to highlight the traditional feeding practices of the dairy animals and chemical compositions of the dairy rations in Goa. A total of 66 farmers were selected randomly from different Talukas of Goa, which included 1170 dairy animals. The feeding traditions practiced by the dairy farmers were either stall feeding or grazing or both. Exclusive stall feeding was practiced by 68.2% of the dairy farmers. The concentrate feeds were either purchased pellet (24.2%) or home-made (1.5%) or mixture of both (74.3%). Among the ingredients of the home-made concentrate feeds, ground maize and cotton seed cake were most preferred. Majority of the dairy farmers (53%) were using naturally grown karad grasses during rainy season only. Paddy straw (25.8%), dry karad grass (22.7%) and kadaba kutti (21.2%) were predominantly used as dry roughages. Among the un-conventional feeds, spent brewers' grains were mostly used. Only 47% and 25.8% of the dairy farmers were feeding their dairy animals based on the milk yield and lactational stage, respectively. The concentrate feed offered varied from 2-10 kg/ animal/ day in milch animals and 2-6 kg/ animal/ day in dry animals. The amount of cultivated green fodder offered varied from 3.0-30.0 kg/ milch animal/ day and 3.0-15.0 kg/dry animal/ day. The CP content of the purchased concentrate feeds varied from 17.3-20.8%. The CP, EE, CF, NFE, TA and AIA of the home-made concentrate feeds were 8.6-23.1, 1.3-15.3, 2.5-30.3, 35.6-84.2, 1.8-8.5 and 0.2-1.4, per cent respectively. The CP content of the cultivated green fodder varied from 6.7 to 19.6%, while the CF content varied from 21.1 to 41.4%. It could be concluded that scientific interventions is needed in the traditional feeding practices of the dairy animals to make the dairy farming more profitable venture.

## Information Seeking Behavior of Farmers and Extension Personnel

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Information seeking behavior is a broad term encompassing the ways individuals articulate their information needs, seek, assess, and use the needed information. Information acquisition depends on needs of individuals involved in specific activities such as farming and extension management. Information is important for the production process, the economy of products, technical quality, production capacity, and the market and market related needs, such as competitive intelligence. Information is needed because it affects individuals' livelihood activities. Knowledge about information needs and information seeking behavior of the farmers is crucial for effectively meeting their information needs. Understanding about the type of information sources preferred by the farmers could be useful for extension services in developing their policies. This study is therefore centered on the information needs and information seeking behavior of farmers and extension personnel regarding farm management practices. In this background, a study was carried out in the rural communities of Sitapur district of the state of Uttar Pradesh. It investigated the information needs of farmers regarding crop cultivation practices, KVK personnel and State Agricultural Department Officials (SAD). A sample of 60 farmers, 20 KVK and 20

SDA personnel were selected using random sampling technique. Data was collected by using structured interview schedule and it was analyzed by using percentage analysis. Regarding primary information sources, all the farmers perceived personal contact (100.00%) as the most important source of information followed by mobile phone (61.67%) and TV (30.00%). State office personnel too perceived personal contact (75.00%) as the most important source of information followed by mobile phone (65.00%) and TV (35.00%). But post office personnel in contrast to SAD personnel had the choice for mobile phone (90.00%) followed by TV (55.00%) and personal contact (30.00%). Regarding modern communication devices, 71.67 per cent of farmers used mobile phones followed by radio (61.67%), TV (53.33%) and news paper (38.33%). Almost all SAD/KVK personnel possessed news paper, mobile phones, radio (90.00%), TV and computer (85.00%) and internet (35.00%). Further, it revealed that 71.67 per cent of farmers, and all of KVK and SAD personnel had mobile phone. It is very interesting to note that not a single farmer knew about the operation of the internet, but 55 per cent of KVK and SAD officials knew about how to use an internet. It reveals that information needs of farmers and extension personnel were mostly occupation driven. The study recommends that the farmers should be provided with a formal system of information provision like the services of extension personal and state agricultural department officers. For this, information services like Short Message Service (SMS) and web portals in local language should effectively be utilized.

## Impact of Redgram Cropping System FLD's in Groundnut and Ragi Based Cropping Systems and Strategies for Higher Productivity

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Groundnut and finger millet are the major crops of Tumkur district in Karnataka. The farmers of the district get an average yield of 5.26 quintals groundnut per hectare and 15.25 quintal ragi per hectare and obtain an average net income of Rs. 5500-7000/ha. With this background, Krishi Vigyan Kendra, Tumkur has conducted Front Line Demonstrations on redgram and ragi from last 4-5 years as pure crop and also intercropping of redgram in ragi and groundnut in 8:2 ratio. The results obtained through FLD's indicated that farmers obtained 10-11 quintals of redgram per hectare and 20 quintals of ragi seeds as pure crop and obtaining Rs. 11,000-12,000/ha. net income as against Rs. 6000/ha. and Rs. 7000/ha. net income from groundnut and ragi as pure crop. Apart from this, pulse crop cultivation results in improvement of soil fertility, lower incidence of pest and diseases in groundnut and efficient utilization of nutrients and moisture in soil and results in expansion of area under red gram from 7000 ha. in 2007 to 18,700 ha. in 2010 due to efforts of KVK and Department of Agriculture through supply of quality seeds like BRG-1, BRG-2 and TTB-7 and other advisory services through adoption of certain extension strategies like timely availability of critical inputs from nearby market, incorporation of short duration varieties, promoting suitable intercropping systems, production of quality and improved seeds made available to farmers at his doorsteps at reasonable rates, creation of informal seed village system, proper storage methods of seeds to avoid damage, value addition etc., This resulted in improvement of socio-economic status of farmers as well as improvement of soil fertility.

## On Farm Testing Approach for Management of Snails in Horticultural Crops

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The giant African snail, *Achatina fulica* Bowdich belongs to phylum Mollusca and is native to East African coastal regions. It is known to infest many crops like cereals, commercial crops, vegetables, fruits and ornamentals. Recently it is found to attack areca and other intercrops of areca gardens in Shimoga, Hiryur, Davanagere and Tumkur districts of Karnataka. Apart from areca it is a serious pest of vegetables like brinjal, tomato; fruit crops like banana, papaya in Tumkur district. Damage caused by them results in qualitative loss that result in low income to the farmers. With this background an OFT was conducted in horticultural crops in farmers field at Chikkanahalli, Sira taluk; Matthihalli, Tiptur Tq; Devihalli, Turvekere taluk of Tumkur district. The farmers don't adopt any control measures or use locally available materials like lime or salt to control them. Ready made bait metaldehyde (Snail kill) @ 3-4 kgs/acre is recommended in controlling the snails. Metaldehyde is costly (Rs.320/Kg) and more over not easily available to farmers. With these available technologies, different baits like papaya, banana, guava, tomato, cabbage and rice bran were evaluated in attracting snails to these baits. Among these baits fruits like ripen papaya and rice bran were found to be the most effective baits in attracting the snails. Different insecticides like Methomyl, Monocrotophos, Carbaryl, Dichlorvas, Lime powder, Salt and Urea were tested with these effective baits for controlling the snails. Among the different insecticides evaluated Methomyl @ 10 gms/kg ripen papaya or rice bran was found to be the most effective insecticide when mixed with ripens papaya/rice bran followed by ready made bait Metaldehyde. Methomyl + Papaya/rice bran was more economical and cheaper (Rs 150/acre) compared to Metaldehyde (Rs. 1000/acre) in controlling the snails. Most of the farmers of the district are Organic farmers and hesitate to use metaldehyde and chemical control had adverse effect on the pet animals in the surroundings. So KVK Tumkur educated the farmers regarding non chemical methods of controlling the snails through community approach in collection of snails in rainy season and burying them deep in soil, good field sanitation by removing the dead and decaying organic matter that acts as breeding site for snails, destroying snail habitats by eliminating refuse files, loose boards and stones, ploughing the soils twice a year etc., Also KVK, Tumkur encouraged the farmers in adopting biological control of snails by rearing ducks, crabs and pigs that feed on snails.

## Effect of Front Line Demonstration on Yield of Cumin

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Cumin is an important Spice crop sown in Rabi in jaisalmer district of Rajasthan. The seeds of cumin are mostly used as condiments in the form of an essential ingredient in all mixed spices and in curry powder for flavoring vegetables, pickles, soups, sausages, cheese and other preparations and also for seasoning of breads, cakes and biscuits. It is used in many Ayurvedic and veterinary medicines as carminative, stomachic, astringent and is useful against diarrhoea and dyspepsia. Besides these qualities it is an important cash crop for the farmers of Jaisalmer District and conditions are advantageous for cultivation of cumin but the crop accounts for 30.28

and 30.30 % of area and production, respectively in Rajasthan. But then again, the average district yield is 3.5 quintal/hectare, which is significantly lower than the national average (5.5 quintal/hectare). There is scope of improvement in productivity leading to higher production; it is possible through regular surveys, farmers meetings and Kisan Gosthi followed by providing them to improved seed and recommended package of practice. To exhibit this, 50 Front Line Demonstrations were organized by KVK, Jaisalmer between 2005 and 2010 at eight different sites under actual farm situations.

Usual farmer's practices were treated as control for comparison with recommended package i.e. improved seed + balanced fertilizer. The result of FLD revealed that yield of Demonstrations under improved seed + balanced fertilizer was higher (27.58 %) over Control. The economics and cost benefit ratio of both control and demonstrated plot was worked out. An average of Rs 85600 was recorded net profit under recommended practice while it was Rs 51700 under farmers practice. Cost benefit ratio was 3.72 under demonstration, while it was 2.66 under control plots. Through conducting Front Line Demonstration of improved seed + balanced fertilizer, yield potential and net income from Cumin cultivation can be enhanced to a great extent with increase in the income level of the farming community.

## Extension Support System to Promote the Organic Farming

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There has been a tremendous increase in production and productivities after the independence of the country. The year of 1966-67 was the turning point in Indian Agriculture when high yielding variety seed's were introduced and fertilizer got real impetus. Fertilizer has played a critical role in making the Green Revolution a success. This has resulted not only in self sufficiency in food grain production of 241 Mt during 2010-11 but also made country food surplus. Still we have to increase production further through the use of improved production technologies including fertilizers, pesticides, high yielding varieties etc. But, the injudicious use of chemicals in the ecosystem resulted in nutrients imbalances, pollution of soil, air and ground water as well as health hazard and extinction of many plant and animal species which have attracted serious concerns. Also the stagnation in productivity with higher cost of production makes the people to worry. As of today, organic food accounts for 5-10% of food sales worldwide. In the future, growth is expected to range from 15-50% annually depending on the country (2008-09 estimation by FAO). Organic farming seems to be more appropriate in the present scenario of changing climate, as it considers the important aspects like sustainability of natural resources and environment. Organic farming is based on the knowledge on how nature works and trying to work with nature rather than to keep fighting against it. India is bestowed with lot of potential to produce all varieties of organic products due to its various agro climatic regions. Currently, India ranks 33rd in terms of total land under organic cultivation and 88th position for agriculture land under organic crops to total farming area. The cultivated land under certification is around 2.8 million hectares. This includes 1 million hectares under cultivation and the rest is under forest area (wild collection). The paper explains the need to develop appropriate effective extension support system at farmers' level which can help us to promote the concept as well as real practices, field experiences to adopt organic farming system with a goal to feed over populating country like us. The present paper also advocates the adoptability of organic farming and its advantages. This system will helpful to the farmers for providing latest technological support prevailing in different parts of the country, which will spread the concept of organic farming.

## Vegetable Crops Grown and their Traditional Value Added Products Prepared by Farmers under Water Stress Conditions of Hot Arid Regions of Rajasthan

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A study was carried out on vegetable crops grown and their traditional value added products prepared by farmers under water stress conditions of hot arid regions of Rajasthan during 2007 to 2010. The study revealed that the major vegetables grown by farmers during different season under water stress conditions were mateera (*Citrullus lanatus*), snapmelon, kachari (*cucumis callosus*), brinjal, bottle gourd, ridge gourds, clusterbean, round melon, Indian aloe, okra, tomato, chilli, fenugreek (leaves), coriander (green), green onion, mustard leaves, sangari (pods) of khejri (*Prosopis cineraria*), moringa pods, etc. The vegetable particularly, mateera (*Citrullus lanatus*), snapmelon, kachari (*cucumis callosus*), bottle gourd, ridge gourds, clusterbean, round melon, khejri (*Prosopis cineraria*), etc. were grown under mixed cropping system during Kharif season. A few (13 – 22 %) farmers grow the above vegetables under sole and inter cropping system also. During Rabi season and irrigated conditions, brinjal, cauliflower/cabbage, spinach, fenugreek (leaves), coriander (leaves), carrot, radish, pea, green onion, etc., were grown by > 29.62 % farmers (out of total vegetable growers) on a small scale (0.1-0.5 ha). Pods of Khinp (*Leptodedia pyrotechnica*), fog flowers, clusterbean pods, mothbean pods and products, cow pea pods and products, green gram pods and products, amaranth (Chandlai), fenugreek, drumstick, chenopod (Bathua), land caltrops, mustard leaves, gram leaves, black nightshade (Makoa), Giloy, etc. were the major traditional and underutilized vegetables which are grown by farmers of hot arid regions of Rajasthan. The dehydrated pods of cluster bean, moth bean and sangria of Khejri; dehydrated fruits of kachri, snapmelon, round melon, ker, ber; the pickles of sangria, kachri, snapmelon, Indian aloe, tumba, khinp; the Rayata of chenopod, flowers of fog, khinp; various kind of juices, powders chatani, jem, jelly, etc. the major value added products of arid vegetables which were prepared by farmers / local peoples by using their own indigenous knowledge / vision / insight and traditional methods.

## Rice Weeds Management through Metamifop 10EC under Changing Climate Condition and Its Effect on Soil Microflora

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Changing climate is responsible for variation in weed flora on different crop season. Weeds cause serious ecological problems and are capable of altering the process of the biodiversity and ecosystem. The commonly used chemicals for controlling weeds may persist in the soil for longer period and their residues may adversely affect the crop growth. But presently the herbicides are safer, low persistent, low dose and thus lesser effect on soil microflora. Experiment conducted during kharif 2009-2010 at C Block Farm, Kalyani, West Bengal with sandy loam in pH-6.78 to study the effect of Metamifop 10EC on weed management in DS rice and soil microflora. The experiment was conducted in RBD with treatments viz. Metamifop 10EC at dosages 50, 75, 100 and 125 g a.i ha<sup>-1</sup> (T1 –T4) and Cyhalofop Butyl 10EC @ 100 g a.i. ha<sup>-1</sup> (T9) sprayed at 2-3 leaf stages and

only the Metamifop 10EC at same dosages (T5-T8) sprayed 5-6 leaf stage, T10 - Hand Weeding at 20 & 40 DAS, T11 - control were replicated thrice. Before sowing seed treatment done by *Trichoderma viridis* @ 4 g kg<sup>-1</sup> and fertilized as recommended dose of NPK (60:30:30 kg ha<sup>-1</sup>). Among two application stages of Metamifop 10EC showed better control in 2-3 leaf stages of grassy weeds. The higher two doses of Metamifop 10EC recorded significantly better yield than that of the lower two doses in both the stages of application and Metamifop @ 100 and 125 g/ha were par among themselves in terms of weed control and yield. Hand weeding treatment recorded maximum grain and straw yield (3.82 and 4.55 t/ha). No phytotoxicity in paddy was observed in any doses of Metamifop 10EC. There were no significant variations on the microbial population of the soil in the rhizosphere region of the rice due to the application of Metamifop 10EC. The microbial population at harvest showed higher in number in respect of the initial in all doses of Metamifop 10EC.

## Survey and Surveillance of Weed Flora of Bastar District in Chhattisgarh: An Extensive Case Study

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Under National Invasive Weed Surveillance Programme (2008-2010), a thorough survey of existing weed flora in cropped, non-cropped and garbage area was done with a view to study the block and district wise weed flora of all the districts of Chhattisgarh as well as to keep surveillance on newly entered five invasive weeds during imports of wheat from different European countries, Russia, Australia etc. Three dominant weed species with highest IVI in vegetables were *Cynodon dactylon*; *Euphorbia geniculata*; *Cyperus rotundus*; in Sugarcane were *Paspalum conjugatum*; *Commelina benghalensis*; *Portulaca oleracea* and in Rice; *Cyperus rotundus* ; *Cynodon dactylon*; *Echinochloa colona* were the dominant weeds in Bastar district.

While during Rabi season, total 142 villages of 6 blocks were surveyed during the period from 2008 to 2009-10. A total number of 27 weed species in winter rice, 15 weed species in Chickpea; 29 weed species in vegetable and 30 weed species in rice-fallow were identified during the survey in cropped area of Bastar district. *Cynodon dactylon* registered with highest density, dominance, frequency, relative density, relative frequency, relative dominance and IVI among the 30 weed species in rice-fallow. However, ecological parameters of weed *Phyllanthus amarus* were found to be lowest amongst the 30 weed species in the rice-fallow field.

Three dominant weed species with highest IVI in different crops of Bastar district during Rabi'08-10 are as Winter rice; *Ageratum conyzoides*; *Commelina benghalensis*; *Cyperus rotundus*, in Chickpea; *Leucas aspera*; *Melilotus alba*; *Medicago denticulata*; In vegetable; *Cynodon dactylon*; *Chloris barbata*; *Cyperus rotundus* and in rice-fallow; *Commelina bangalensis* ; *Ageratum conyzoides*; *Cyperus rotundus* were the dominant weeds during rabi season in Bastar district. However, a total number of 60 weed species during Kharif season and 52 weed species during Rabi season were identified during the survey in non-cropped area of Bastar district. *Cassia tora* during Kharif and *Cynodon dactylon* during Rabi registered highest density/m<sup>2</sup>, frequency, relative density, relative frequency and IVI.

Whereas in garbage area of Bastar district, A total number of 50 weed species during Kharif season and 37 weed species during Rabi season were identified during the survey. *Cynodon dactylon* during Kharif and *Ageratum conyzoides* during Rabi registered highest density/m<sup>2</sup>, frequency, relative density, relative frequency and IVI.

## Performance of Dual Flow Grass Filters Integrated with Groundwater Recharge System for Stormwater Treatment

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A dual flow multimedia stormwater filter integrated with a groundwater recharge system was developed and tested for hydraulic efficiency and pollutant removal efficiency. The influent stormwater first flows horizontally through the circular layers of planted grass and bio-fibres. Subsequently the flow direction changes into vertical direction so that water moves through layers of pebbles and sand and finally it gets recharged to the deep aquifers. The media in the sequence of Vegetative medium: Bio-fibre- Pebble: Sand were filled in 9 proportions and tested for the best performing combination. Three grass species, viz., Typha (*Typha angustifolia*), Vetiver (*Chrysopogon zizanioides*) and St. Augustine grass (*Stenotaphrum secundatum*) were tested as the best performing vegetative medium. The adsorption behaviour of Coconut (*Cocos nucifera*) fibre, which was filled in the middle layer, was found out by a series of column and batch studies and corresponding isotherms were developed.

The dual flow filter showed an increasing trend in hydraulic efficiency with increase in flow rate. The chemical removal efficiency of recharge dual flow filter was found very high in case of K<sup>+</sup> (81.6 %) and Na (77.55%). The pH normalizing efficiency and EC reduction efficiency were also recorded high. The average removal percentage of Ca<sup>2+</sup> was moderate, while that of Mg<sup>2+</sup> was very low. Iron concentration was found increasing after filtration. A new terminology, UPI (Universal Performance Index), which represents the weighted average of the hydraulic efficiency and quality improving efficiencies, giving extra weightage to the latter, has been introduced. UPI values of each filter combinations were determined and subjected to the analysis of variance. In case of vegetative media, typha plant performed well followed by vetiver and St. Augustine grass. As far as filter proportions are concerned, the ratio 1:1-1:2 (plant: fibre- pebble: sand) showed much superior performance compared to all other proportions. Based on the estimated annual costs and returns, all the financial viability criteria (IRR, NPV and BCR) were found favourable and affordable to farmers for investment on developed filtration system.

## Communication Behaviour of School Going Children

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Television has its important place in current Indian social life due to its various entertaining and educative programmes. Television has influenced not only the children and the youth but it has also influenced the adults and the old people. Doordarshan has new direction to the children and youth as well as it has filled the free time of old people as such the felling of depression and loneliness is vanishing from the minds of these sections.

The study was conducted in Meerut district of Uttar Pradesh to find out the communication behavior of school going children. Eighty respondents were selected purposively of 6th to 9th standard of school going children by the systematic random sampling method of the sampling techniques. Study revealed that majority of respondents i.e. 43.75 per cent belong to the age group of 12 to 14 years. Majority (43.75 %) of respondents were the student of belonging to class 9th while 31.25 per cent respondents were of 7th class followed by 15 per cent of 8th class. Majority (68.75%) respondents were watching television 2 to 3 hours daily followed by 17.5

per cent up to 1 hour daily, while 13.75 per cent respondents were watching television for more than 3 hours daily for different purposes. Study shows that majority (60%) respondents were spent time on their studies between 2 to 3 hours daily followed by 31.25 per cent more than 3 hours daily, while 8.75 per cent respondents were spent time on their studies only up to 1 hour daily. All the respondents (100%) reflected that they watch on television movies, sports and songs. Discovery channel is the next choice to watch on television by 88.75 per cent of respondents followed by serials (76.25%), cartoons (68.75%), educational (42.5%), news (30 %), horror movies (26.25%) respectively. Where as only 11.25 per cent respondents were spent time on other television programmes.

## SAR: Protection For Plants

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Systemic Acquired Resistance (SAR) refers to a distinct signal transduction pathway that plays an important role in the ability of plant to defend themselves against pathogen. SAR can be distinguishing from other disease resistance responses by both the spectrum of pathogen protection and the associated changes in gene expression. The SAR signal transduction pathway appears to function as a potentiator or modulator of other diseases resistance mechanism. SAR is characterized by the increased of a large number of pathogenesis- related genes, in both local and systemic tissues. SAR are broad spectrum plant defense responses that can be induced biologically by challenging a plant with a weaker strain of specific pathogen or exposing a plant to natural and/ or synthetic chemical compound. SAR is preceded by an increase in SA (Salicylic Acid) concentration that SA for SAR is synthesized via the shikimate phenylpropanoid pathway. These results suggest that either SA is not the long distance signal or very small amounts of SA in infected leaves are sufficient full SAR indication. It is found that maximum induction of SAR occurs only at high concentrations of SA in the infected leaf. Even though SA is not likely to be the translocated signal that triggers SAR in distal plant organs, it is essential for SAR signal transition. The induction of SAR in systemic tissues in SA was dependent. These findings indicate that SAEs and essential signal in SAR and that it is required downstream of the long distance signal.

## Knowledge and Adoption of Control Measure Practices of Various Weeds of Rice Crop

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Rice plays a vital role in the national food security. India is the second largest producer of rice after China. Chhattisgarh is popularly known as the “Rice Bowl of India”. The extent of yield reduction of rice due to weeds is estimated to be 15-90 per cent. Now a days timely unavailability of labours make weed control difficult, but the mechanical weeding and new pre and post emergence herbicides/weedicides for rice give an effective alternative to labour expensive way of weed control. Out of the thirty weeds infesting paddy crop, nine weeds are of major economic importance. A research was organised to assess the knowledge and adoption of control measure practices of various weeds of rice crop and average yield losses due to various weeds. In all one hundred and sixty rice growing farmers were randomly selected from purposively chosen Dhamtari and Nagri

blocks of Dhamtari district of Chhattisgarh and personally interviewed with the help of structured interview schedule to collect the relevant information from the respondents. The data were statistically analysed and logically presented in tabular form. The result of the study revealed that with the exception of Resamkata (*Alternanthera sessilis* L.), majority of the rice growers had medium knowledge regarding control measure practices of various weeds of rice crop viz. Motha (*Cyperus* spp.), Kala bhangra (*Eclipta prostrata* L.), Sol ghas (*Aeschynomene indica* L.), Kaua keni (*Commelina benghalensis* L.), Pekereal weed (*Monochoria vaginalis*), Badauri (*Ischaemum rugosum* L.), Machharia (*Corchorus aestuans* L.) and Sawa (*Echinochloa colona* L.). So far as high knowledge is concerned 26.62 per cent respondents had high knowledge about Sawa followed by Resamkata (14.38%), Motha (6.25%), and Kala bhangra (6.25%). As regards low knowledge 38.12, 25.0, 18.12, 18.12, 17.50, 16.25, 12.50, and 11.25 per cent respondents were found to have low knowledge about Resamkata, Machharia, Pekereal weed, Badauri, Kaua keni, Sol ghas, Kala bhangra and Motha respectively. It was also observed that majority of the respondents (76.25%) had medium adoption of control measure practices of Kala bhangra weed of rice crop followed by Sol ghas (71.87%), Motha (68.75%), Sawa (66.87%) and Machharia (58.75%). 41.25 per cent respondents had high adoption of control measure practices of Resamkata while 23.12 per cent had low adoption of control measure practices of Resamkata. Further, it was found that as per farmers perception out of the nine weeds studied Motha caused 10 per cent reduction in yield an average which amounted to Rs 5001.75 per hectare followed by Sawa (8.35%, Rs 4179.24 per hectare) and Badauri (4.97%, Rs 2489.76 per hectare) in puddled rice.

## Marketing of Milk and Milk Products: Opportunities for Entrepreneurship in Punjab

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Punjab's agriculture which is considered as "Kohinoor" of Indian states because of its major contribution in national pool of food grains, milk, fish, fruits & vegetables is in a state of disarray since last few years. Dairying has played a prominent role in strengthening rural economy which forms an integral part of the farming system in the state. At present, dairying in Punjab is on the threshold of large scale expansion. Punjab is one of the milk surplus states in India. About 50-55 percent of the total milk produced in the state is retained at the source for domestic consumption. Out of total marketable surplus of milk only 14-15 percent is being handled by organised sector while the rest of the milk is either sold as fresh, non-pasteurized milk or as traditional dairy products at local level through unorganized channels including milk traders and halwais. However, now-a-days quality and food safety has taken the centre stage due to growing health awareness of modern consumers. To ensure the quality of foods available in market and global trends of food safety issues government of India has passed a new legislation in the form of Food Standards & Safety Rules 2011 which came into force w. e. f. 5th August 2011. This new food safety rules have created a golden opportunity for the small and medium level milk producers and entrepreneurs to start their own mini dairy plants at farm level and add value to their produce on one hand while fulfilling the aspirations of the modern consumers for quality milk and milk products on the other hand through proper processing and packaging of milk at farm level. However, to promote the entrepreneurship in milk processing sector at farm level it is essential that the small and medium level dairy farmers and traders should be given appropriate training on various aspects of dairy processing and marketing of milk and milk products so that they can harness the full benefits of opportunities arises out of new food safety legislations. Moreover, it would be a win-win situation for milk producers/ entrepreneurs and consumers.

## Impending PRA in Agricultural Extension

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Agricultural extension, approaches and methods in developing countries have been changing in recent years to reflect a new development paradigm that emphasizes sustainability, institutional change, and a participatory learning process leading to local capacity building and empowerment (Adhikarya, R. 1994). Participatory Rural Appraisal (PRA) is considered to be an important tool of agricultural extension. An increasing number of project analyses have shown that participation by local people is one of the critical components of success in agriculture, irrigation, livestock, and water projects (Reij, 1988; Cernea & IBRD, 1991; Uphoff, 1992; Narayan, 1993; World Bank, 1994; Pretty et al., 1995; Pretty & Vodouhe, 1997). PRA facilitates collection and analysis of information by and for community members. It also emphasizes local knowledge and involves communities in the inventorying, monitoring, and planning of local development. Because it is a collaborative process, PRA actively empowers marginalized communities, de-emphasizes hierarchies, and helps to identify resource needs and sustainable use systems. Promoting research on PRA, its impact, effectiveness, diversity, use, and applicability, in order to gain greater insight and knowledge about participatory methods will pave the way for rural developmental path. The purpose of this paper is to reflect upon how Participatory Rural Appraisal (PRA) can be used for moving the extension profession towards a development paradigm that embraces learning rather than teaching processes. The analysis on this approach suggest some important policy implications as creating pilot projects in existing or new agricultural extension programs to test PRA and other participatory methods in diverse settings and the governmental and non-governmental staff working in agricultural extension and development should begin integrating the PRA methods and activities for the future agricultural extension and development.

## Impact of Junk Food Consumption on the Intelligence Level of School Ooing Children

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Nutrition is one of the many factors that affect development of brain and the intelligence of children. Deficiencies of nutrients such as vitamin B12, folic acid, zinc and iron are frequently associated with impairment of memory, concentration and learning ability. A total of 130 school going children's were selected from two different schools of Trans Yamuna area of Allahabad district, U.P. (India). Types and frequency of junk food consumption was recorded. Data on dietary intake was collected by using 24 hours dietary recall method and average daily intakes were compared with dietary allowances recommended by I.C.M.R. (1988). Height and weight measurements were taken and computed followed by clinical survey. Standard Progressive Matrices (SPM) was taken as a measure of intelligence, which was applied to interpret the intelligence level of respondents. Correlations among junk food consumption frequency and intelligence level of school children's were computed. The energy and fat intakes of the respondents were higher than RDA for children's. However, intakes of other nutrients were inadequate. Significant differences in the average height and weight of both boys and girls were found in comparison to NCHS Standard Values. Clinical signs of deficiencies noticed were anaemia (63.07 percent), night blindness (7.69 percent), pale conjunctiva (22.3 percent), bleeding gums (26.92 percent) and

marked dental cavities (15.38 percent). The intelligence level of school girls and boys were assessed by conducting intelligence test (Standard Progressive Matrices). And it was found that majority of students 31.5 percent obtained Vth Grade, followed by 26.9 percent obtaining IVth Grade, 17.69 percent obtained IIIrd Grade, 12.3 percent obtained Ist Grade and 11.53 percent obtained IInd Grade. Significant correlations noticed were among (i) girl's intelligence grade and girl's consumption frequency (junk foods), (ii) boy's intelligence grade and boy's consumption frequency, (iii) girl's intelligence grade and boy's consumption frequency and (iv) boy's intelligence grade and girl's consumption frequency.

## Extent of Knowledge and Adoption of Recommended Practices of Agri -Silvi and Agri-Horti Systems

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In agro-forestry production system trees protect the agricultural crops in the dry in-hospitable climate by conserving soil moisture, increasing the atmospheric humidity and by providing protective cover from scorching winds, increasing soil fertility, thereby stepping up agricultural yields and ensuring supply of much needed food, fuel, fodder, and timber. The study was conducted in Tumkur district of Karnataka during 2009. A sample of 125 farmers were randomly selected from Koratgere, Tiptur and Chikkanayakanahalli taluks to study the extent of knowledge and adoption of recommended practices of agri -silvi and agri-horti systems by the farmers in Tumkur district of Karnataka. The findings revealed that regarding overall knowledge level, majority (68%) of the growers of both the systems (agri-silvi and agri-horti system) were found belonging to medium knowledge level. Similarly regarding overall adoption level 40 per cent and 50 per cent of the farmers belong to medium adoption level in case of agri-silvi and agri-horti systems respectively. Major problems faced by the agri-silvi growers were rapid growth of prolific trees may hinder the growth of food crops in the long run (88%) followed by yield reduction due to crop competition (85%) lack of knowledge on package of practices (76%). therefore in order to overcome these problems, farmers suggested that providing tree species with short duration (94%), adoption of wide spacing (78%) and providing adequate extension services (65%). Similarly in case of agri-horti system 88 per cent of the respondents expressed no immediate return from the fruit crops followed by the rapid growth of prolific trees may hinder the growth of food crops in the long run (79%).

## Effect of Occupation on Hearing Ability amongst Traffic Police Personal in Kathmandu, Nepal

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Health is not something that one possesses as a commodity, but connotes rather a way of functioning within one's environment (work, recreation, and living). The work environment constitutes an important part of man's total environment, so health to a large extent is affected by work conditions. Personnel engaged in traffic duty, have to undergo physical strain in an environment polluted by fumes, exhaust of vehicles, use of blowing horns,

blow of dust in the air by a speeding vehicle, etc. The personnel also pursue a near-sedentary type of work as they only stand at one place for long hours or just walk a few meters, only when necessity arises. The aforementioned factors pose as a health hazard. Still little has been done to assess their health status and suggest preventive measures for the upliftment of their health. This study has been conducted on the objective to find out the personal profile and assess the effect of occupation on their hearing problems. Total 125 Traffic Police of Kathmandu Metropolitan City including, Male and Female, out of 25 traffic police units based on random number were taken as respondents. Out of 125, 97 male and 28 female respondents were selected. A set of structured questionnaire was used for data collection. Majority of the respondents' lies in their productive age group 25-29yrs. Sixty eight per cent of respondents were married followed by 32.00 per cent of respondents were unmarried. This table shows majority of respondents (59.20 per cent) were from High school (SLC), the minimum requirement of educational qualification for this job is high school (SLC). Respondents suffered from some degree of hearing problem were 24.00 per cent. Majority of respondents (60 per cent) did not get treatment for their hearing problem. Majority of respondents got psychological stress from this job. The highest frequency was mental tension (49.60 per cent). This is due to the long exposure in poor environment, poor preventive methods and continuously working for longer period. Some awareness program about health and pollution is also needed for them. They should be taught how to prevent from environmental pollution.

## Entrepreneurs in Protected Agriculture in Maharashtra

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Commercial floriculture has scaled a new height in the last decade to achieve a record production of 987.40 metric tonnes of loose flowers and 4794 million cut-flowers. The area under flower cultivation is estimated to be 1, 67,000 ha during 2008-09 (NHB database 2009). But still India accounts for a mere 0.65 percent of the \$11 billion global flower trade. Total area under cultivation of different flowers in India presently is 1, 67,000 ha of which only 1,100 ha are under protected cultivation (The Hindu, 2009). India's total export of floriculture products was estimate to be Rs. 340.14 Crores in 2007-08. The Maharashtra is one of the leading states in area under protected agriculture in India. Keeping in view of the tremendous market potential, both in domestic and International markets, floriculture industry has a great potential. With the introduction of protected cultivation in recent time has resulted into tremendous growth and increase in area, production of flower and exotic vegetables. The state Maharashtra was selected purposively for the study, as it was one of the few states of India which has maximum area under protected cultivation. Pune district was purposively selected as protected cultivation is quite popular in this mild climate region in the Shahyadri hill ranges. From Pune district sixty respondents were selected by using simple randomly form three tahsils: Maval, Khed and Haveli. In order to understand the kind of respondents practicing protected cultivation, an attempt has been made to draw a profile sketch, especially highlighting the personal and socio-economic attributes of entrepreneurs, and their communication behaviour. It was evident that majority of the respondents from study area had received training on cultivation of flowers and vegetables, post harvest management, and packaging, etc. But sill some of them did not under gone training of any sort; this shows the lack of awareness regarding importance of training. The respondents also earn higher income due to their enterprise, and income was continues throughout the year as compare to the other field crops of which production is seasonal and dependent on climate. It was also found entrepreneurs engaged in this enterprise were moderate to high on the entrepreneurial success scale specially developed for the study. The growth of this sector is hinder by many constraints like, no proper pricing of the cut flowers, high commission by

middlemen, pricing heavily depending on demand and supply, high initial investment, lack of skilled labour, pest and disease management, no proper information regarding pricing of the cut flowers to the growers by commission agent and lack of knowledge of cold chain management. High initial investment and high bank interest rate are the main reason for reluctance on farmer to take on protected cultivation technology. If the floriculture industry is regulated, subsidies part increase and technical guidance provided at easy access level then floriculture in general and protected cultivation in particular in witness a revolution. Many more favourable regions from the state would come in focus.

## Training Needs of Dairy Farmers in Bihar

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Livestock sector is playing a major role in National economy. So far milk production is concerned, our country ranks first position, but considering the total number of cattle, buffalo and livestock farmers involved in it, the performance is not satisfactory. The present study was conducted on 200 dairy farmers of different districts of Bihar viz. Patna, Jahanabad, Gaya, Purnea, Bhagalpur, Darbhanga etc., who came at Department of Extension Education, BVC, Patna, selected through Distt. ATMA, NGO, for training purpose. The different areas of training were selected with the help of progressive farmers other than respondents and scientists of this college. Finally four important broad areas of training viz. Feeding, Breeding, Health Care and Management were selected for study purpose. The training needs in the selected areas of training were measured on a three point rating scale: No training needed, few training needed and more training needed, with 0, 1 & 2 scores respectively. Total scores for each broad area were tabulated to explore the training need hierarchy on ranking pattern. The findings of the investigation revealed that among different areas viz. Feeding, Breeding, Health Care and Management occupied IInd, IVth, Ist, and IIIrd position respectively. Pooled data analysis showed that maximum need of training perceived for health care (68 %) followed by feeding (46 %) management (39%), and breeding (36%). Thus, the findings emphasized the importance of training on Health care and Feeding practices so that they can develop this occupation as an enterprise for their socio-economic upliftment. Govt. of Bihar as well as Govt. of India should also make proper strategy on priority basis to impart training on the aforesaid parameters. The different agencies involved in training of the farmers should ensure the need based dissemination of knowledge to get maximum output.

## Management Approaches for Root Knot Nematode in Tomato

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Tomato, *Lycopersicon esculentum* Mill. is recognized as a valuable vegetable crop and is parasitized by root-knot nematodes. Yield losses to tomato due to root-knot nematode *Meloidogyne* spp. in India range from 40 to 46% (Bhatti and Jain 1977; Reddy 1985). Roots infected with *Meloidogyne* spp. were severely galled, plants showing poor growth and symptoms of chlorosis. This nematode is a serious constraint in the successful cultivation of this crop (Reddy 1985). Experimental results based on two seasons (2006-2008) data revealed clearly that the

application of *Trichoderma viride*, and *Pseudomonas fluorescens* either as seedling dip or along with FYM provided relatively higher yield as compared to untreated plots. Both the bioagents alone as seedling dip of tomato showed relatively effective against the root-knot nematode (*Meloidogyne incognita*). However, application of fungal bioagents, *Paecilomyces lilacinus* as seedling dip was not effective for protection of tomato crop from root knot nematode and enhancing tomato yield. The fungus was found to give highest yield (13.40kg/plot) in 2007-2008). Among the treatments, *T. viride*/*P. lilacinus* along with FYM was found to be the best treatment in terms of reduction of root galling and suppression of soil population of root knot nematode in tomato. The efficacy of neem granule at 30kg/ha against root-knot nematode in tomato was found statistical at par with carbofuran at 2 kg a.i./ha. in 2006-2007 and 2007-2008.

## Use of Composite Materials for the Development of Light Weight Farms Yoke

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Natural fibers are subdivided based on their origins, coming from plants, animals or minerals. All plant fibers are composed of cellulose while animal fibers consist of proteins (hair, silk, and wool). Plant fibers include bask (or stem or soft sclerenchyma) fibers, leaf or hard fibers, seed, fruit, wood, cereal straw, and other grass fibers. The use of such materials in composites has increased due to their relative cheapness, ability to recycle and for the fact that they can compete well in terms of strength per weight of material. Natural fibers can be considered as naturally occurring composites consisting mainly of cellulose fibrils embedded in lignin matrix. The reinforcing efficiency of natural fiber is related to the nature of cellulose and its crystallinity. The existing traditional yoke is made up of the wood of trees like Tun and Haldu which are not easily available in different parts of India. The life of a yoke is about 3 to 5 years, due to this 628 tons of wood is required at every 3-5 years in India that would create a burden to the presently available forests. To overcome these problems, there is a need to develop yoke from waste bio-materials. Keeping this in view, a yoke from composite material was designed and developed and relative comparison between traditional wooden and developed yoke has been done.

## Efficacy of Hydrophilic Polymer (HP) on Quality and Yield Components in Tomato

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The Fruits volume of tomato by water displacement methods. The results of the investigation revealed that among the treatments the application of HP (1.75 g/plant) into the soil increased significantly quality parameters viz. ascorbic acid content (38.80 mg/100g fr.wt) & lycopene content (4.48 mg 100 fr. wt.-1). The results of this study have shown quality parameters and yield component could be improved by adding hydrophilic polymer to the soil as the polymer in soil can store extra water and enable to the plants to utilize that water over an extended period of time, which maintained the biosynthesis of quality parameters in plant system.

## Constraints in Adoption of Improved Ginger Production Technology

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Ginger (*Zingibe rofficinale*) is an important spice crop of the world. In northern India, planting of Ginger is done on the onset of monsoon. Therefore, a study was conducted by the scientist of KVK Shahjahanpur to find out the major constraints responsible for the adoption of improved ginger production technology. For the study the sample population was selected from 15 villages of the 02 blocks namely Bhawalkhera and Dadraul. A total of 75 respondents were selected randomly for the study. These constraints were realized for wide spread adoption of ginger cultivation in the district. To overcome such constraints the ginger growers suggested that the proper guidance and awareness of improved technology may be cleared field demonstration, field visit, practical skill oriented training programs and programs on full package of practices for ginger production.

## Productivity and Economics of Castor : Intercropping Systems in Drylands

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An experiment was conducted during the rainy season of 4 consecutive years from 2005 to 2008 at Hisar with the objective to assess the productivity of castor in various plant geometries and to see the feasibility of various intercrops in castor crop. The soil of the experimental site was sandy loam in texture, low in available nitrogen (202 kg/ha), medium in available phosphorus (16.4 kg/ha), high in available potash content (388 kg/ha) and slightly alkaline in reaction (pH 8.0). Fourteen treatments consisting of castor sole at 75 cm x 60 cm and 90 cm x 60 cm, castor paired at 60/90 cm x 60 cm and 60/120 cm x 60 cm, intercropping of 1 row of green gram, moth bean, cluster bean, cowpea and pearl millet in castor paired row system of 60/90 cm x 60 cm and intercropping of 2 rows of green gram, moth bean, cluster bean, cowpea and pearl millet in castor paired row system of 60/120 cm x 60 cm were tested in randomized block design with 3 replications. A basal dose of 40 kg N + 20 kg P<sub>2</sub>O<sub>5</sub>/ha was applied before sowing of the crops. All the crops were sown on 13 July 2005, 15 July 2006, 24 June 2007 and 26 June 2008. The recommended cultivars 'DCH 7' castor, 'Muskan' green gram, 'RMO 40' moth bean, 'HG 563' cluster bean, 'HC98-46' cowpea and 'HHB 67' pearl millet were used in the experiment. Picking of castor was done 3 times, i.e. 120, 150, 180 days after sowing. Intercrops, i.e. green gram, moth bean cluster bean, cowpea and pearl millet were harvested 86, 71, 114, 80 and 81 days after sowing. The total rainfall received during the crop growth season was 239, 131, 249 and 382 mm during 2005, 2006, 2007 and 2008, respectively. Among sole cropping of castor, plant geometry had no significant effect on castor equivalent yield. The mean castor yield decreased maximum when 2 rows of pearl millet was intercropped in castor paired row system of 60/120 cm x 60 cm followed by intercropping of 1 row of pearl millet in 60/90 cm x 60 cm castor paired row system. Intercropping of 2 rows of green gram in 60/120 cm x 60 cm castor paired row system gave significantly higher castor equivalent yield (1566 kg/ha), net returns (Rs.4925/ha) and benefit: cost ratio (1.33) over sole castor, castor + moth bean, castor + cluster bean, castor + cowpea and castor + pearl millet intercropping

systems but remained at par with intercropping of 1 row of green gram in 60/90 cm x 60 cm castor paired row system. Thus an intercropping of 2 rows of green gram in 60/120 cm x 60 cm castor paired row system is found to be most productive and remunerative.

## Knowledge Level of Farmers and Adoption of Wheat Production Technologies

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The production of wheat has increased by more than six folds from nearly 12.3 million metric tons in 1965 to a record highest of 80.6 million metric tons in 2009. In India it occupies a premier place among cereals in terms of both area and production. The average productivity of wheat is 26.54 q/ha in the state, which is low as compared to other wheat growing states. To increase per unit production of wheat crop, several technologies have been developed in the ICAR institutes and State Agricultural Universities but only a few technologies have been adopted by farmers. This study focuses on knowledge level of farmers and adoption of wheat production technologies in Aurai block of Sant Ravidas Nagar Districts of Uttar Pradesh during 2010. Data were collected with the help of base line survey of resource rich and resource poor farmers. Most of the farmers belonging to these resource categories did not possess adequate knowledge about seventeen wheat production technologies. Very low levels of adoption were observed for method of sowing and rat control by both categories of farmers, therefore, more emphasis needs to be given in this direction, so that these two most important packages of practices may not be ignored by the farmers.

## Constraints in Adoption of Cross Breeding Programme in Cattle

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Crossbreeding Programme (C.B.P.) was introduced in India in the beginning of the 21st century in order to increase milk production through rapid improvements of indigenous germ plasm. But due to some constraints at grass root level, it has not been yet adopted by majority of the livestock owners. Keeping above facts in view, the study was conducted with objectives to study livestock owner's personal, situational, socio-economical, communicational and other variables and their relationship with the attitude of the livestock owners towards CBP and its suitability to assess the major gynecological problems in cattle and constrains in the CBP faced by the livestock owners and veterinarians or scientists of research area. Four villages were purposively selected from Bareilly District of Uttar-Pradesh. From each village, 30 livestock owners were selected who were having problems in adoption of CBP. In all 120 livestock owners were interviewed and data were collected and analyzed with the help of co-efficient of correlation. Main findings of the study indicated that the variables like personal age, education, socio-economic status, utilization of communication sources and availability of critical inputs were significantly correlated with the attitude towards CBP and its suitability of livestock owners. The major Gynecological problems in cattle reported were uterine infection, repeat breeding, anoestrus and silent heat. The

major constraints perceived by livestock owners were non-availability of veterinary services in villages, local bulls were alternatively used for natural services, difficulty to take cow at A.I. centre and non-availability of green fodder. The major constraints perceived by veterinarians or scientists were non cooperation by livestock owner's during their follow up in CBP, non availability of good quality semen and difficulties to make door to door services. Based on constraints studied and problems identified, extension strategy was suggested so as to make the crossbreeding programme more effective.

## Development of a Rapid Soil Test Method for Diagnosis of Sulphur Deficiency in Soils of Remote Areas

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Over a year the sulphur is becoming deficient day by day particularly in areas where crops are intensively cultivated with the use of sulphur free fertilizers. Thus, the need for detection of sulphur deficiency is felt necessary. However, in all areas the soil testing services cannot reach. In this situation, for detection of sulphur deficiency in soils of all farmers a rapid method was felt to be developed. Thus, in the present study an attempt was made to develop a rapid method that, at least, can diagnose the sulphur deficiency in soil. A turbidity matching method is developed. Results showed that turbidity increased with increase in S content. The samples (144 numbers) that had 0 – 12.5 kg S ha<sup>-1</sup> did not show turbidity. The samples (15 numbers) having 20 – 50 kg S ha<sup>-1</sup> showed faint turbidity (presence of tinge of whitish colour). The samples (5 numbers) that had 70 – 120 kg S ha<sup>-1</sup> showed slightly whitish turbidity (More turbidity than above). The samples (2 numbers) that had 225 kg S ha<sup>-1</sup> showed somewhat whitish turbidity (more turbidity than above). Thus, absence of turbidity detects S deficiency in soil.

## Crop Allelopathy: Natural Technique for Weed Management

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Rice (*Oryza sativa* L.) is one of the most interesting crops in the world from social and economic points of view. An alternative strategy for weed suppression could be the use of chemicals from rice. Allelopathy refers to an ecological phenomenon of plant-plant interference through release of organic chemicals (allelochemicals) in the environment. Allelochemicals may interfere with survival and growth of neighboring or succeeding plants, and may also discourage insects and pathogens. Weeds are a major biological constraint to rice production worldwide. Weeds are major problem in all south-east Asia rice production systems including irrigated, rainfed, upland and deep water rice etc. Weeds in rice commonly causes yield losses of 10 to 40 % and occasionally losses of much higher. One option to reduce chemical herbicide dependency is to utilize bioherbicidal/allelopathic effects that rice may have on certain weeds. To prove the existence of allelopathy in rice, compounds produced by rice varieties or their residues must be shown to interfere with the associated weed species. Recently, allelopathy has gained attention for its potential role in integrated pest management and sustainable agricultural

production. In the future, agriculture may benefit through exploiting this trait for controlling weeds and microbes, optimizing crop productivity, and safeguarding the environment. Higher plants have evolved biosynthetic pathways through which secondary metabolites are synthesized and accumulated in or released from plants. These compounds reach the environment in appreciable quantities via root exudation and leachates during litter decomposition. Plants and crop residue can also be exploited for weed control through intercropping and mulching. An important economic potential of allelopathy is to enhance crop allelopathic activity to suppress weeds. Rice allelopathy has been on the research agenda for a decade.

## Water Requirement of Tuberose (*Polianthes tuberosa* L.)

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An experiment was carried out on kharif season during March, 2009 to March 2010 in university research field to find out how much water is required and economic yield of three varieties of tuberose (Prajwal, Calcutta Single, Calcutta Double) along with three irrigation treatments on IW/CPE 0.4, 0.8, 1.0. The experiment showed that the total water requirement of three varieties of tuberose for the period March, 2009 to March, 2010 were 626.06mm, 695.62mm and 751.27mm. The irrigation requirements were 212.97lit, 247.15lit and 278.32lit for the Prajwal, Calcutta single and Calcutta double, respectively. The different irrigation schedules regardless of the crop varieties on the number of spike per plot were significant. The maximum spike per plot was recorded at 1.0 IW/CPE which gave about 33.15 number of spike per plot, which was superior to 0.8 IW/CPE (32.25) and 0.4 IW/CPE (30.57). The economic analysis of tuberose showed that the higher net returns was recorded at higher moisture regime (IW/CPE at 1.0) followed by intermediate moisture regime (IW/CPE at 0.8) and lower moisture regime (IW/CPE at 0.4). The benefit-cost ratio was just opposite to net return values.

## Trends in Production and Productivity of Cashew in India

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Cashew is one of the most valuable processed nuts on global commodity markets and has the potential to generate employment and revenue for developing countries. India is the second largest exporter of cashew kernels in the world and earns a sizeable amount of foreign exchange (Rs. 228890 lakh during 2007-08). In India, cultivation of cashew is confined to Kerala, Karnataka, Goa and Maharashtra along the west coast and Tamil Nadu, Andhra Pradesh, Orissa and West Bengal along the east coast. To a limited extent it is being cultivated in Chattisgarh, North Eastern States and Andaman & Nicobar Islands. Area under cashew nuts in India increased by 53 percent from 5.65 lakh hectares during 1993-94 to 9.23 lakh hectares during 2009-10. the compound annual growth rate in production was the maximum in Maharashtra (10.81%) followed by Tamil Nadu (7.30%) and Orissa (6.24%). The yield of Cashew nuts in India increased from 694 kg/ ha during 1993-94 to 695 kg/ ha during 2009-10. cashew prices in Goa were higher as compared to other states because of the large size of nuts as compared to the nuts of other states.

## Effect of Different Vegetable Protein Sources on the Performance of Vanaraja Chicks

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An experiment was conducted in one hundred eight Vanaraja (3 weeks old) chicks to find out the effect of different vegetable protein sources either singly or in different combinations on the performance of Vanaraja chicks. The chicks were randomly distributed in to six dietary treatments having three replicates of 6 chicks each. Six experimental diets were prepared with different vegetable protein sources either alone or in different combinations (D1-SBM, D2-GNC, D3-SFC, D4-SBM+GNC, D5-SBM+SFC, D6-GNC+SFC). Experiment was conducted from 3-10 weeks in a completely randomized design. Weekly BW gain and feed consumption were recorded and feed efficiency was calculated. There were significant ( $P<0.05$ ) differences in body weight gain and feed efficiency among the different treatments. The body weight gain and feed efficiency were significantly increased in chicks fed D4 (SBM+GNC). The data were subjected to statistical analysis. There were significant ( $P<0.05$ ) differences in body weight gain, feed intake and feed efficiency among the different treatments. The body weight gain and feed efficiency were significantly increased in chicks fed D4 (SBM+GNC). The feed efficiency was significantly better in chicks fed combination of SBM and GNC compared to those fed other diets. It was concluded that combination of SBM and GNC was superior to other combinations and individual protein sources in terms of better performance and lower cost of production in Vanaraja chicks.

## An Innovative Learning Tool in Extension Education

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In the recent days, content designers and developers of electronic learning have introduced new technology mediated approaches for content generation. Most of the electronic learning in the past is developed for a specific purpose based on a specific technology, which is highly expensive and time consuming process. In this paper the authors present a new paradigm for content generation and localization based on an instructional technology called Reusable Learning Objects (RLO), which follow the features of reusability, interoperability, durability and accessibility. This technology would bring a major change in designing and development of cost effective educational material for mass agricultural education and extension in an open and distance mode of learning. Lifelong learning is a new concept in agriculture education. Open and distance learning facilitates the lifelong learning process. This concept enables the learner to learn new concepts without actually formally attending the training institute. Internet has proved to be a boon for the Open and Distance Learning (ODL). Thousands of people register and study in the ODL pattern using online learning courses. RLO is yet another form of ODL. The study material in the RLO is prepared and edited by the respective subject matter experts and made available for distance learning. RLOs are small learning units. They are the online instrument of mass education and learning in the digital format. RLO can be reused, scaled, shared and stored in a knowledge

repository. RLOs vary in size, scope, and level of granularity ranging from small chunks of instruction to a series of combined resources to provide a more complex learning experience. Reusable Learning Objects have been used by many Educational Institutes worldwide. It has been recently introduced into the Indian Agriculture and education system. Two major projects regarding RLO development in agriculture in India has been elaborated in this study. There are various formats in which information can be represented in an RLO. A few of these have been discussed. PowerPoint presentation is a powerful format for RLO learning and development. Developing RLOs in PowerPoint format have a lot of advantages which makes this a popular method of RLO development.

## Constraints of Oil Seed Growers in Increasing Oil Seed Production through Co-operatives

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The study was conducted with 114 respondents of 8 Oil Seed Co-operative Societies of Bikaner and Sri Ganganagar District of Rajasthan. The data so collected were classified tabulated and statistically analysed which led to the salient findings. The most important constraints as perceived by the oil seed growers in increasing production of oil seeds were ranked 1st from technical constraints "Lack of constant technical guidance by the oil seed growers co-operative societies." From financial constraints "High yielding varieties seed is very costly." From infrastructural constraints "Irregular and inadequate supply of inputs." From social constraints "Lack of systematic procedure of election for OSCS." From educational constraints "Lack of knowledge of chemical fertilizers and their proper application methods" and from other constraints "Problems in funds during the procurement time" and "proper marketing facilities are not available in the interior areas." It was interesting to note that almost all the respondents felt that the federation has suffered net losses right from its separation from RAJFED. They suggested that for successful running of Tilam Sangh it should be merged in RAJFED again.

## Perception of Tribal towards Health Management of Wild Animals by Indigenous Technical Knowledge

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The Madhya Pradesh has been among the pioneering states in the country. It was found that in order to increase animal productivity of farms with the increasing awareness about tribal participation in different enterprises and their contribution to economy, intense efforts are being made at upgrading the skills of tribal and providing them with greater opportunities for wild life conservation in Madhya Pradesh. The present investigation was carried out in the near area of Pench Tiger Reserve Park sites under forest conditions at Village- Jamtara of Chhindwara district of Madhya Pradesh, because this village is more prominent in tiger reserve park. The

specific objectives of this study were to document, methodologies and utility of indigenous knowledge of tribal for treatment of wild animal and to explore their own rationale behind the use of this knowledge. Traditional techniques are in harmony with socio-economic conditions imposed by the alternating. The finding of the present investigation revealed that tribal practicing traditional herbal medicine for wound animal techniques have sufficient traditional knowledge and these ITKs are being widely used and are quite popular, it is commonly observed that they stress more on animal than local areas as they get quick feedback from it. However the tribal are not aware of the improved veterinary technique of wild animal. If they are made aware of improved techniques and methods, lot more gains can be derived which will help to sustain their livelihood for these tribal. Now tribal youths have shown interest in veterinary diploma by acquiring scientific knowledge on their own hand. On Survey it was found that the tribal have more active participation and practical knowledge alongwith their spouses. Therefore, keeping in view certain unique factors of the state like associate to them and also if tribal were given proper education and training in the field they can be of much help to improve their socio-economic status. The need of the hour is to utilize various development schemes for tribal.

## A March towards Farm to Non-farm Enterprises in District Jhajjar

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Jhajjar district is undergoing a tremendous level of shift from farm to non-farm economy at least in one third of its area, especially one which is adjoining Nazafgarh and Bahadurgarh. A big chunk area has been taken up for Reliance Mega Special Economic Zone and there are string of institutions coming in addition to coming up large network of roads linking upcoming Kundli-Manesar-Palwal Six Lane Highway passing through big tract of this tract. Moreover, KMP (Kundli- Manesar- Palwal) Highway would be joining Delhi Mumbai Industrial Corridor (DMIC) and the whole district would be crisscrossed big vehicular traffic of agri-food and similar agrarian commodities of entire North India, almost upto Jalandhar as per the projection of DMIC authorities. This kind of projections combined with huge number of change of land-use into brick-kiln for last twenty years in the district, calls for a forward-looking approach in bringing issue of long-range planning for utilization of natural resources, human resources and industrial resources in such a manner that the transition from agrarian to industrial-service sector economy in at least one-third of district remains sustainable for not only economical but ecological and cultural aspects. It is pertinent also to seed new entrepreneurial culture amongst members of landed and non-landed classes in the district so that full advantages of gap in supply of quality agri-food items to burgeoning National Capital Region could be taken up as a very ready market. Various kind of employment opportunities could be created at a very high levels if a joint-vision in planning and execution is created for implementation of not only food supply chains starting and ending from the district but also such chains could involve other districts. Though competence-enhancing role of KVK for providing 'service-provider capacity' to its trainees first be supported by the government as well as public sector. The role of KVK scientists becoming bridge between its trainees and letting them to get jobs or contracts with public/private sector enterprises, should also be strengthened. Krishi Vigyan Kendra Jhajjar has devised very innovative model from farm to non- farm enterprises keeping in view above strong facilitating factors.

## Perceived Profitability of Foot and Mouth Diseases Vaccination

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The study was confined the animal husbandry technology users (Pashu Mitra) of a cluster of six village of Bareilly district of UP. Productivity of milch animals was found to be more with increased cropping intensity and natural grasses & fodder availability. Animal rearing communities had low level of perceived profitability score because they are resource poor and having less knowledge whereas the scientists were having high level of perceived profitability score, since they formulate the technology as close lab and have not take verification trail at farmers field. Animal rearing communities did not have positive perception/assumptions whereas scientists considered it as highly positive & profitable technology. Correlation between age, on of effective family worker in animal husbandry, family education status, area under fodder crops, herd size milk produced by desi & cross bred cattle, Accessibility of technology, Adoption of FMD vaccination and profitable had significant and positive relationship. Subsequently, this study of the particular technology is advocated to those researchers/scientist/technology generators who are involved/ indulge during the preparedness and dissemination of technology while they reconsidered/revamping those parts who are disabled for the sustainable animal welfare and conservation.

## Impact of Frontline Demonstration on Adoption of Improved Technologies of Green Gram

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Green gram is an important kharif pulse crop widely consumed in India. In Ajmer district, the area under green gram has fluctuated from 70926 to 94831 ha. during last five years. The average productivity has been ranged from 0.19 to 7.52 qtl./ha. during this period. Since the average productivity is far below the potential yield so efforts were made to increase the adoption of technologies through frontline demonstrations (FLD). FLDs were undertaken by Krishi Vigyan Kendra Ajmer on the improved technology of green gram in the district during 2004-2010. An attempt has been made to know the productivity of frontline demonstration as well as farmers' practice. The results revealed that an average yield of 11.93 qtl/ha was recorded under demonstration plot whereas 9.06 qtl/ha in farmers' practice. Thus, the average yield of demonstration plot of green gram increased 31.67% more over local check. An attempt has also been made to know the knowledge level of farmers about improved technologies of green gram and adoption of these technologies by the 50 FLD and 50 non-FLD farmers. FLD and non-FLD farmers were randomly selected from FLD villages. It was found that majority of FLD farmers (80%) had medium to high knowledge level whereas only 42% non-FLD farmers had medium to high knowledge level about the improved technologies of green gram. Among the various aspects of improved technology of green gram, majority of FLD and non-FLD farmers had similar knowledge about sowing methods and sowing time. There was a wide gap in knowledge between other aspects such as optimum seed rate, seed treatment, improved variety and basal application of fertilizer in green gram cultivation in FLD and non-FLD farmers. The study also highlighted that there was a significant difference in the extent of adoption of

improved technologies of green gram cultivation between FLD and non-FLD farmers. This might be due to the fact that the FLD programme was effective in changing attitude knowledge and adoption of improved technologies of green gram and also improved the relationship between the farmers and scientists and built confidence between them.

## Dietary Supplements of Calcium

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Calcium in body is required for Vascular contraction and vasodilation, muscle function, nerve transmission and hormonal secretion. The body uses bone tissues as a reservoir for and source of calcium, to maintain constant concentrations of calcium in blood, muscle and intercellular fluids.

Rich source of calcium include milk, yogurt and cheese. Nondairy sources include vegetables, although the bio-availability is poor. Foods fortified include many fruit juices and drinks, tofu and cereals.

The two main forms of calcium in supplements are carbonate and citrate .Calcium carbonate is more commonly available and is both inexpensive and convenient. Calcium carbonate is absorbed most efficiently when taken with food due to it's dependence on stomach for absorption whereas calcium citrate is absorbed equally well when taken with or without food. Other calcium forms in supplements or fortified foods include gluconate, lactate and phosphate.Calcium citrate malate is a well absorbed form of Calcium found in some fortified juices. Calcium supplements include a varying amount of calcium. For example, calcium carbonate is 40% calcium by weight whereas calcium citrate is 21% calcium.Vitamin D3 or it's precursor like Calcitherol is essential for binding of calcium in the bones. The total amount of calcium consumed at one time decides the percentage of calcium that will be absorbed by the body. Absorption is highest in doses <500 mg so one who takes 1000 mg/ day of calcium from supplement might split the dose and take 500 mg at two separate times during the day. Calcium carbonate may cause side effects including gas, bloating, constipation, or a combination of these symptoms. Calcium citrate is reported to produce less of there side effects.

## Constraint Analysis of Village Panchayat Leaders in their Job Performance

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The village (grama) was governed by an assembly which in the Rigvedic period was known as "Sabha". Panchayats have got greater responsibilities and functions to transform the rural society in may dimensions. A research was undertaken in Jabalpur block of Madhya Pradesh to ascertain the level of job performance of village panchayat leaders and to analyse the problems faced by them in their job performance. Eight gram panchayats of Jabalpur block were randomly selected and 103 random chosen village panchayat leaders were

personally interviewed with the help of interview schedule. An open ended question was asked and the respondents had to narrate the constraints/problems faced by them also give suggestions to improve their job performance. The frequencies and percentage were calculated and the ranking of constraints and suggestions was done accordingly. The main constraints narrated by the respondents were: bureaucratic apathy, non-cooperation and interference; lack of funds, grants from outside agencies and inadequate local generation, sarpanches are autocratic in functioning; groupism is encouraged by sarpanches; construction works are not prioritised as per local needs etc. Some of the important suggestions given by the respondents to improve their job performance were: development works should be carried out by mutual discussions/consent; training and exchange programmes should be frequent to enhance awareness; trainings should be given at panchayat level; due consideration should be given to the members views; rules and regulations should be made known etc. It may thus be concluded that the bureaucracy had not accepted the concept of decentralised governance with a favourable attitude and proved to be a major hurdle in the effort to decentralised planning. On the other hand the grass root leaders were of the opinion that the developmental efforts should be carried out by taking into consideration the views of all the elected representatives and with consensus.

## Improvement of Livelihood of Tribal Farmers through Front Line Demonstration of Chickpea in Bastar District

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Chickpea (*Cicer arietinum* L.) is one of the most important legume crop of the world and grown in different agro climatic and ecological environments. It has major share in the country economy among the crops in the Present Pulse farming system. Bastar district is a tribal dominating district of Chhattisgarh. Frontline demonstration on chickpea was conducted during 2005-06 to 2009-10 with the objectives.

- (i) To access impact of front line demonstration of chickpea on productivity and economics as compared farmers practices.
- (ii) To dissemination improved production technology of chickpea to farmers.

On the basis of FLD results and observation it can be concluded that the demonstration plays a major significant role in increasing the productivity of chickpea and socio economic status of the farmers.

Demonstration results were compared to farmers practice. The highest grain yield (11.00 qt/ha) and income (9360 Rs./ha) was recorded in the year 2009-10 in FLD which was 96 percent more over the farmers practice (5.60 qt/ha) on an average there was 107 percent and 205 percent increase in yield and income, respectively over farmers practice. Higher B.C. ratio 2.30 was also recovered on compared to 1.6 under farmers practice. The productivity and income gained under FLD over farmer's practice of chickpea cultivation created greater awareness and motivated the other farmers to adopt appropriate production technology in the district. Encouraging data on yield obtained from FLD in the region suggested that front line demonstration is an effective tool for technological dissemination where farmers learn through participatory approach. The identified constraints and suggested strategies will definitely be helpful in improving the productivity of chickpea in the district.

## Growth and Yield of Sunflower in Rabi Season as Affected by Soil and Foliar Application of Boron

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A field experiment was conducted with a view to observe the efficacy of boron on growth and seed yield of sunflower. The variety "Aditya" was tested at Central Research Farm of Bidhan Chandra Krishi Viswavidyalaya, Gayeshpur, Nadia under new alluvial zone (NAZ) of West Bengal, during rabi season of 2010-2011, Experimental soil was sandy loam in texture and neutral in reaction (pH- 6.9). Experimental result showed that growth attributes, namely, plant height, basal girth, dry matter weight and head diameter were greatly influenced by the soil and foliar application of boron. Seed yield of Sunflower crop was also significantly influenced by application of different levels of boron. Highest dry matter weight (8.87 kg) and seed yield (2.22 t/ha) were obtained with foliar application (0.3%) of boron at 30, 40 and 50 DAS. It was clearly revealed that the application of FYM did not show any significant effect in achieving higher growth and seed yield of sunflower in NAZ of West Bengal.

## Growth Pattern and Technological Impact of Pulses Production in India: An Emerging Sector

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'Pulses' are the edible seeds of legumes, like lentils, beans, peas and chickpeas. The name pulse is derived from the Latin pulis meaning thick soup or potage. Pulses play an important role in the nutritional security of a large number of people. They represent a major source of protein in many developing countries, especially among the poorer sections of the population who rely on vegetable sources for their protein and energy requirements. Many early civilizations developed around diets of pulses for protein, combined with a cereal crop to provide energy. Moreover, in recent years there has been a change in the consumption of pulses in several developed countries where they are increasingly considered as health foods. India is the largest producer and consumer of pulses in the world. Pulses are grown on 22-23 million hectares of area with an annual production of 13-15 million tonnes (mt). India accounts for 33% of the world area and 22% of the world production of pulses. The major pulse crops grown in India are chickpea, pigeonpea, lentil, moongbean, urdbean and pea. About 90% of the global pigeonpea, 65% of chickpea and 37% of lentil area falls in India, corresponding to 93%, 68% and 32% of the global production, respectively (FAOSTAT 2009). The import of pulses increased steadily due to low import tariff rates (attracting low or zero duty). Interestingly, India's export of pulses grew at a far greater pace than its imports i.e. from 1.09 thousand tonnes in 1980-81 to 447.44 thousand tonnes in 2005-06. The time series data pertaining to 1980-81 to 2008-09 have been considered, which has been divided into two periods, before (1980-81 to 1994-95) and after (1995-96 to 2008-09) i.e. launch of Technology Mission on pulse production to carry out study on growth pattern of major pulse crops in India.

## Impact of National Rural Employment Guarantee Act (NREGA) on Poverty Alleviation among the Beneficiaries

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National Rural Employment Guarantee Act, (NREGA) has the potential to transform the geography of poverty. The present study was conducted in Morar Block of Gwalior district. A sample of 110 beneficiaries of rural poor was used for the fulfillment of objectives under this investigation. Majority of the beneficiaries increased their annual income and belonged medium to high income category. Personal characteristics like- education, social participation, land holding, credit availability, source of information, contact with NREGA personnel, attitude towards scheme and knowledge of the beneficiaries about scheme were observed significant relationship with annual income increased of the beneficiaries due to scheme. The major suggestion for improvement of benefits of the programme was suggested more than one third of the beneficiaries– The entitlement of 100 days should be increased of guaranteed employment in a financial year are in terms of a household.

## Impact of Self Propelled Paddy Transplanter in Kerala

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In Self-propelled Paddy Transplanter technology deviates from the traditional technology (manual transplanting) of cultivating irrigated paddy in a number of ways. Linear production function was used to analyse resource use efficiency. The average net returns were Rs. 19,798/ha and Rs. 27,462/ha in traditional and self-propelled paddy transplanting methods of paddy cultivation respectively. The yield realised in traditional method was 4.83t/ha and it was 5.70t/ha in self-propelled paddy transplanting method. The cost of cultivation in both the methods was more or less the same (Rs. 30,387/ha in traditional method and Rs. 31,750 in self-propelled paddy transplanting). The benefit cost ratio was 1.87 in self-propelled paddy transplanting technology as compared to 1.65 in manual transplanting. The estimated production functions were significant with high R<sup>2</sup> for both the methods. The regression coefficients for labour, fertiliser and miscellaneous were positive and statistically significant in case of self-propelled paddy transplanting method while none of the variable was found significant in case of traditional method of paddy cultivation. Production function analysis of self-propelled paddy transplanting method indicated that there was a further scope for increased use of human labour in the short run keeping the use of other resources at a constant level. This was also true for fertiliser and miscellaneous items as values of elasticity of production for these resources were highly significant. The findings of this study demonstrate the superiority of self-propelled paddy transplanting technology in terms of yield and returns advantage. However it is worth mentioning here that the actual adoption rate of self-propelled paddy transplanting technology among paddy growers is low, which appears to be a puzzle given the encouraging performance of the new technology. These observations call for enhanced extension services for popularising the self-propelled paddy transplanting technology. The timely guidance to the farmers from the extension agencies and to the persons involved in the transfer of technology to the farmers' field would be immense help in this direction.

## Studies on the Fish-duck and Dyke Vegetable Cultivation Practice in Integrated Farming System

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Integrated farming is a sustainable and effective tool for improving rural economy due to its cumulative cost effective low investment and higher profitability. It optimises the farm productivity per unit area through incorporation of recycling wastes and residues from one farming system to the other with due environmental consideration. Considering the efficacy of this viable production system, the study was conducted by the Dakshin Dinajpur Krishi vigyan Kendra of Uttar Banga Krishi Viswavidyalaya, W.B. in purposively selected Dakshin Dinajpur district of West Bengal as On Farm Trial (OFT). The trial was conducted in 03 different treatment options and in each option minimum seven 07 replications were taken under farm field condition. The generated data were computed and analysed through statistical tools and overall economic return in terms of productivity of the fishery, duckery and vegetable cultivation practices, their gross return, net return and ultimate B:C ratio. It was observed that better production and sustainable economic return can be achieved through crossbred duckery and fish culture along with dyke vegetable cultivation in pond based integrated farming practices.

## Export Potential of Contract Farming of Gherkin in Karnataka State

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Gherkin industry in India is primarily concentrated in the three southern states of Karnataka, Andhra Pradesh and Tamil Nadu. Karnataka state accounts for almost 60 percent of the gherkin production. The State has the ideal climatic conditions for growing Gherkins, a crop with tremendous potential for exports, which is making farmers richer. A slow, silent revolution is sweeping over the countryside in Karnataka, with numerous small and medium farmers taking to contract farming of cash crops like gherkins, cotton, marigold etc. The crop is popularly known as "pickling cucumber" or small cucumber among farmers. The world market for gherkin is estimated to be about 23 lakh metric tons a year. The supply from India is about four per cent of the demand. The crop, which was introduced in the country in 1990, became popular among small and marginal farmers of Tumkur, Bangalore Rural, Hassan, Kolar, Chitradurga, Dharwad and Bagalkot districts. This study was conducted using secondary data to assess the growth rate and performance of gherkin. The study revealed that growth rate of quantity (tonnes), Jars (processed products) and Value (Rs. lakh) were observed to be 0.081 per cent 0.452 per cent, 0.137 per cent per annum respectively and was statistically significant during the period 2001-2005. The performance of gherkin in Karnataka was measured using Stability Index. Stability index of quantity (tonnes), Jars (processed products) and Value (Rs. lakh) were observed to be 0.55, 0.109 and 0.46 respectively. It may be concluded that the growth performance of Jars (processed) was very high. Hence the growth performance of total gherkin production in the state was satisfactory.

## Comparative Performance of Crossbred Pigs Reared Under Scientific Feeding Practices and Field conditions in Goa

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An experiment was conducted to study the performance of the 50% crossbred (Goa Local X Large White Yorkshire) piglets at farmers' field under different traditional and scientific feeding practices in Goa. Twelve 50% crossbred (Goa Local X Large White Yorkshire) castrated male piglets were divided in to four groups of three piglets in each group. Randomly, one group was maintained as control group under scientific feeding practices. The other three groups were distributed to three pig farmers maintaining their units under different traditional feeding practices i.e. bakery waste(TBW ), kitchen waste (TKW) and cooked broiler offal + Wheat bran (T BO+WB ) based feeds. Among the traditional feeding practices groups, the crude protein content of the T BO+WB (36.15%) was higher ( $P<0.05$ ) than the TBW (9.69%) and TKW (14.49%). The crude fiber content of the TBW (4.14) and TKW (4.40) was similar ( $p>0.05$ ) with the control (4.97), but lower ( $p<0.05$ ) than the T BO+WB (21.85). The daily body weight gain of T BO+WB (237.77 g) was higher ( $P<0.05$ ) than the TBW (112.89) and TKW (111.33), but lower than the control group (308.44). It was concluded that traditional feeding practices has to be developed based on the nutritive value for the existing feed resources and increasing pig production.

## Pest Problems in Tomato and Management in Chhattisgarh

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Crop pests continue to cause losses of about 18% (weeds-33%, insects-26%, diseases-26%, rodents and others 15%) of crop yields despite the fact that more than 48,000 metric tones of technical grade chemical pesticides are used to manage the pests in the country. India is the second largest producer of vegetables after China, with an estimated annual production of about 125.8 million tones from an area of about 7.8 million ha. Tomato is one of the most important vegetable grown through out India. It is a wholesome and nutritious vegetable and rich source of minerals and vitamins. The total area under tomato cultivation in India is about 0.5 lakh ha with a production of 8.2 lakh tones and productivity of 15.90 tones/ha. However, in the past few years tomato growing farmers are facing economic loss in its cultivation due to high incidence of wilt disease which considerably decreased the yield of the crop. Moreover, due to its tender and supple nature, tomato is prone to pest attack particularly fruit borer. Looking into the above facts, location specific Integrated Pest Management module was synthesized and field validated in a farmers participatory mode for higher profitability and economic returns in a participatory mode with tomato growing farmers to raise their socio-economic status under Chhattisgarh plains. The implementation of IPM strategy in farmers' field proved much superior to their own control practices. If this approach is propagated by proper motivation and involvement of farmers it may lead to substantial increase in yield keeping in view the soil health and eco-friendly.

## Use of Audio Visual Aids to train the Farmwomen at KVK

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Proper selection and the use of Audio-visual aids is the key to get success in extension teaching. The selection should always be made of such Audio - visual aids which will produce the desired results. Keeping this in view a study was conducted to see the use of Audio-visual aids to train the farm women at Krishi Vigyan Kendras. It was found that none of the technician of ICAR & SAU KVK said that he always use audio-visual aids during training programmes but majority of the technicians from NGOs KVKs always use audio visual aids during training programmes. The selection of audio visual aids in advance for the training programme was mostly done by majority of the technicians of KVKs of ICAR, NGOs & SAUs. It is observed that some of the technicians of SAU&NGO KVKs had mostly selected personal letters and leaflets as audio visual aids in the training programmes ,whereas the technicians of KVK of ICAR,NGOs and SAUs mostly uses charts and posters as the audio- visual aids to train the farmwomen. This study also revealed that majority of the technicians of KVKs of ICAR, NGO and SAUs mostly used to select audio-visual aids on the basis of the topic of the training programmes. The study also shows that audio- visuals were made available to majority of the technicians of KVK of IVRI and Sultanpur in time.

## Popularization of Resource Conservation Technologies (RCTs) in Fatehabad District of Haryana

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Training is the one of the widely recognized tool for transferring skill oriented technologies. KVK Fatehabad has transferred many agricultural techniques through trainings, demonstrations, field days, kisan goshtis etc since its inception. In this series the KVK has conducted trials at 5 fix locations every year to evaluate long term effect of Zero-till in Wheat. The results shown that besides saving of around Rs. 4000/ha in zero till sown fields, 6% higher yield was also observed as compared to conventionally sown fields. A total of 117 new zero tillage machines have been purchased by farmers of the Fatehabad district covering 27300 ha area under zero till during 2010-11. Besides this, the KVK has also organized three trainings of one week each on “Scaling up of water productivity in agriculture” with special emphasis on Laser Land Leveling. A total of 100 farmers participated in three training programmes related to this technology during 2010-11. In 2010-11, 49 new machines have been purchased and an additional 5800 ha area has been laser leveled in the district. A total of 11800 ha area were levelled by 97 machines. By using this technique saving of water upto 25% besides increased efficiency of seed germination, fertilizer and other inputs, thus reducing cost of cultivation and increasing factor productivity upto 20%. Hence it may be concluded that KVK Fatehabad playing a vital role in popularization of various Resource Conservation Technologies in the district and serving the farmers for their betterment.

## An Information Dissemination System for Fish Farmers at Grass Root Level – A Suggested Model

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The quality and quantity of fish production is totally dependent on the skill and expertise of the fish farmers who are either illiterate or academically weak. It has been experienced that the traditional systems followed by them for production of fish is not viable to meet the growing market demand. To cope with this, they need information on various scientific/technical systems to enhance the production. In this regards the data collected on what kinds of information they need, problems they face in getting required information and their remedies have been analysed. Altogether 200 questionnaires were distributed among fish farmers in each district of North 24-Parganas and South 24-Parganas. Sixty percent (60%) response were received from South 24-Parganas and fifty percent (50%) replies received from North 24 –Parganas. After analyzing the data it is found that 85% of fish farmers prefer conventional fish farming and only 15% of them are engage in scientific fish farming. For providing the fish farmers easy access to information it has been suggested that two fishery information centres be set up in each Panchayat beside taking other relevant measure.

## Geographical Indications for Marayoor Jaggery – An Analysis

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A Geographical Indication (GI) is an indication which identifies agricultural, natural or manufactured goods originating from a definite geographical territory, as having a special quality or reputation or other characteristics. Marayur or Marayoor is a place in the Idukki District of Kerala state, well known for its jaggery production. The branding of Marayoor jaggery, in South Kerala, dates back to at least a century ago. Entire sugarcane produced at Marayoor is being utilized for jaggery production. This popular brand of jaggery fetches a premium price at domestic as well as export markets. In sugarcane farms of the village, there are small jaggery units that manufacture jaggery. It is therefore of great demand in households across the country for the preparation of sweets and dishes. Sugarcane Breeding Institute had taken up a feasibility analysis of Geographical indications (GI) for Marayoor jaggery, as the jaggery producing farmers claimed that it has certain unique characters compared to jaggery produced in other parts of the country. Surveys were conducted at Marayoor panchayat with focus group interviews and group meetings among the sugarcane farmers, NGOs, Traders and Panchayat officials to explore the uniqueness of Marayoor jaggery. Five jaggery samples were collected from different places of Marayoor and an equal number of samples were also collected from Paramathivellur area, another jaggery producing belt in Tamil Nadu. Results of analysis revealed that Marayoor jaggery has certain unique characteristics such as, low Electrical Conductivity (EC), high purity, less reducing sugar and low sulphate content. Low sulphate and high purity shows its organic nature and the unique dark brown colour distinguishes Marayoor jaggery from others. Discussing these issues, the paper also highlights the cost benefit and SWOT analysis of Marayoor jaggery production for exploring the feasibility of GI.

## Study the Extent of Possibilities of Taking up of Agro Forestry Systems and Their Economics by the Farmers in Tumkur District of Karnataka

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Agro-forestry is recognized as one of the technologies to overcome the shortage of food, fodder, fuel wood, minimizing adverse effects of environmental degradation and to achieve the national target of 33.30 per cent area under tree cover. The study was conducted in Tumkur district of Karnataka during 2009. A sample of 100 farmers was randomly selected from Koratgere, Tiptur, and Chikkanayakanahalli taluks to study the “Extent of possibilities of taking up of agro forestry systems by the farmers in Tumkur district of Karnataka”. The potential tree species planned to grow by the farmers under the agri-silvi and agri-horti systems were Eucalyptus (95.55%), Teak (39.33%), Coconut (95.55%), Cashew (77.77%) and Amla (57.77%). Estimated returns from the tree species of the both system (agri-silvi and agri-horti), Teak will give maximum return (Rs. 20,000/20 years old plant), Neem (Rs. 5000/20 year old plant), Banni (Rs. 3000/10 years old). Marketing channels used by the farmers of agri-silvi system in marketing their timber to Green power project (74%), traders (62%), timber merchants to timber retailer (46%). Whereas, in case of agri-horti system, farmers were selling their horticultural produce to traders Green power project (82%), (55%) and timber merchant-timber retailer (42%).

## Effect of Inositol on Plant Morphology and Seed Chemistry in Groundnut Genotypes

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A field experiment was conducted at the Main Agricultural Station, University of Agricultural Sciences, Dharwad during Kharif 2008. The experiment consisted of two treatments, foliar application of inositol @ 100 ppm at 65 DAS (during pod and seed development) in 10 genotypes of groundnut (TAG 24, JL 24, R-2001-3, K-07, GPBD 4, GPBD 5, K-134, TKG-19A, Girnar 1, and GPBD 6) and another set of genotypes maintained without application as control. The experiment was laid out in factorial design with 20 treatment combinations in three replications. Morphological characters like plant height, number of branches and days to physiological maturity did not differ significantly between treatments and genotypes. Number of leaves, total leaf area, and leaf area index significantly differed between treatments and genotypes. Among the genotypes, Girnar 1 recorded significantly higher TDM (39.58 g), followed by the genotype TKG-19A (34.09 g) and R-2001-3 (30.04 g). Foliar application of inositol increased the harvest index (41.4) significantly over control (40.0). The harvest index was maximum in GPBD 4 (47.9). Inositol application increased seed phosphorus, sugar, phenol, oil contents and also significantly increased the number of pods per plant and there by pod yield. The genotype GPBD 4 had higher seed phosphorus (0.95%) and oil content (53.82%). The genotype GPBD 6 had higher 100 seed weight (41.4 g) followed by the genotype TKG-19A (37.3 g). Among the genotypes, Girnar 1 had higher pod yield (5576 kg/ha) followed by the genotype K-07 (5527 kg/ha).

## A Study of Mung Bean Food Network Development in Haryana

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Food networks are important for many people - deriving income and livelihoods - through works and activities, and these networks are based on a production use and development of local resources. India has many traditional food networks that have evolved over time around key culturally valuable crops, which include wheat, rice, and pulses. Among pulses mung bean (*Vigna radiate* L. Wilczek) is one of the most important pulse crops consumed by both rural and urban people in India. It is consumed at all seasons and in different forms: whole mung bean, mung bean dhal and dehulled mung bean. Quantities of mung bean consumed by the rural households and its production, however, are decreasing over the last years. To explore mung bean food network for its development, we undertook a study of the mung bean production, consumption, processing, and marketing processes from the Hisar district in the state of Haryana, India using qualitative and quantitative research methods. Results from this study indicates that the key constraints to the particular mung bean food network studied include low mung bean yield, persistent disease, lack of efficient primary processing technologies and poor marketing linkages. Moreover the study results suggest possible opportunities for expanding mung bean food network. The changes were faster in sensory quality (Physical) and chemical quality at room temperature than refrigeration temperature. In type B samples the changes in physico-chemical quality were more than that in type a samples. There are different types of concentrated Indian indigenous milk products, such as Khoa, rabri malai, khurchan etc. These products are highly localized in our country.

## Response of Rabi Sunflower to Soil and Foliar Application of Boron

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A farm trial was conducted during Rabi season of 2010-2011 to find out the effect of soil and foliar application of boron on sunflower (var. Aditya). The study was carried out in farmer's field at two different locations i.e. Kushmandi in South Dinajpur district (Old Alluvial Zone) and Kustaur in Purulia district (Red and lateritic zone) in West Bengal. Soil of the experimental area was moderately acidic (pH 4.5). The crop was sown on 27th November, 2010 at a spacing of 45cm x 20cm and fertilized with recommended dose i.e. 80:40:40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O/ ha. The trial was laid out in a factorial RBD with 14 treatment combinations replicated thrice. Treatments were T1: control (No B application), T2: soil application of B@ 20g, T3: soil application of B @ 30g, T4: soil application of B @ 40g, T5: Foliar application of B @0.2%, T6: Foliar application of B @ 0.3% and T7: T3 + Lime (Dolomite) @ 2kg/ha (all these treatments were applied with and without FYM). Soil application of B was done as basal and foliar spray at 30, 40 and 50 days after sowing (DAS). Result obtained in both the location revealed that both soil and foliar application of boron without FYM had a significant influence on growth attributes of sunflower with special reference to plant height, basal girth and head diameter. Seed yield was also improved by soil application (@30 g) as well as foliar application (0.2%) of boron at 30, 40 and 50 DAS. But the performance of sunflower was better in Kushmandi than in Kustaur. In Kushmandi the seed yield (3.34 t/ha) was obtained with foliar application (0.2%) of boronated fertilizer at 30, 40 and 50 DAS, whereas in Kustaur soil application (@30g) of boron as basal gave higher yield (1.86 t/ha). Application of FYM was found to be ineffective in augmentation of growth and seed yield of sunflower.

## Impact of Vacuum Packaging on Various Seed Quality and Biochemical Parameters of Different Spice Crops

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The choice of a packaging material for any agricultural produce differs with the type of markets in which the products are distributed. In developing countries, this choice is largely determined by the cost and availability of packaging material. The main quality contributing factors of spices viz., aroma, flavour and colour are sensitive to the vagaries of climate and are affected by factors like high temperature and humidity, moisture and oxygen, respiration and heating, insects, pests and microorganisms, which work together in causing deterioration. Traditionally, storage of spices in warehouse is done with a jute bag, Double gunny bags, multi wall paper sack or cotton bags are also being used for better protection. But these have the problem of moisture ingress, oxidation and subsequent quality loss. In case of dry whole chilies, due to low bulk density, volume poses a problem, which becomes a crucial factor in shipments and exports.

## Yield Damage Functions for Tea Sector in Sri Lanka and India: An Empirical Estimation

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A Yield damage function helps to illustrate by relating yield damage and some independent parameters of soil such as top soil depth and organic matter content. This study was focussed on three tea growing district, Passara and Watawala sub district of Sri Lanka and the Nilgiris of India where considered 208 tea fields from Passara tea growing region, 52 tea fields from Watawala/Ginigathena tea growing region and 96 tea fields from the Nilgiris tea district covering 66 and 30 tea fields from TANTEA Plantations corporation and four private tea plantations respectively. The results of the study show that the Passara region is responsible for higher yield damage due to top soil reduction and the region shows very shallow soil depth and poor ecological condition. If the Nilgiris is in a condition to manage the issue, Passara tea region of Sri Lanka is required immediate actions to control the problem for sustainability of tea industry of the region.

## An Approach of Rural Banks towards Agricultural Prosperity

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Rural banking in India started since the establishment of banking sector in India. Rural Banks in those days mainly focussed upon the agro sector. Rural Banks were formed under RRB act 1976. Regional Rural Banks

(RRB) are Regulated by the Rural Planning and Credit Department of Government of India and supervised by NABARD. Canara Bank sponsored 8 RRBs earlier out of which three RRBs were in Uttar Pradesh viz. Aligarh Gramin Bank, in District Aligarh, Etah Gramin Bank in District Etah and Jamuna Gramin Bank in District. Agra. But now Shreyas Gramin Bank covers six districts of U.P. as Aligarh, Agra, Etah, Mathura, Hathras and Firozabad. The rural banks provide credit to the weaker sections of the rural areas, particularly the small and marginal farmers, agricultural labourers, artisans and small entrepreneurs. Therefore the aim of the present study was to know the role of Shreyas Gramin Bank in rural development and agricultural prosperity. The three branches of Aligarh district was selected for the present study. The bank schemes, plans, financial status, loan etc. were studied during the research.

## Attitude of Rural Youths towards Different Activities of Nehru Yuva Kendra in Jaipur District of Rajasthan

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The Nehru Yuva kendra of Jaipur district has been working in the area since February 4th, 1973. At present 257 youth clubs are functioning in Jaipur district. This study was conducted by personally interviewing the 118 NYK participating rural youth from randomly selected 9 villages of 3 panchayat samities in Jaipur district of Rajasthan. It was found that majority of the rural youth i.e. 68.65 per cent were having favorable attitude and 17.79 per cent were having most favorable attitude while only 13.56 per cent rural youth were having less favorable attitude. It was also observed that majority of the rural youth (86.44 per cent) were having favorable attitude towards agricultural information can be transferred to rural youth through NYK youth clubs.

## Influence of Organics on Growth, Development and Yield Component of Cluster Bean Genotypes

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A field experiment was conducted at the main Research Station, College of Agriculture, University of Agricultural Sciences, Dharwad during kharif season 2009-10 to study the influence of organics on growth, development and various growth parameters of clusterbean genotypes. The result of study revealed that genotype SARPAN-101 (Hybrid) with treatment of organic poultry manure recorded significantly higher growth and biochemical parameters viz., dry weight of edible part (99.20 g plant<sup>-1</sup>), total chlorophyll (1.60 mg g fresh weight<sup>-1</sup>), photosynthetic rate (48.76  $\mu$  mole CO<sub>2</sub> m<sup>-2</sup> s<sup>-1</sup>). The genotype SARPAN-101 (Hybrid) with treatment of organic poultry manure also recorded significantly higher yield and yield components viz., number of pods per plant (109.38) and pod yield (85.86 q ha<sup>-1</sup>).

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This review is a critical study on the present trend of Indian bovine population improvement and its achievements, problems and corrective measures. India became number one in milk production way back in 1998 but still milk productivity per animal is very low as compared to other countries. In 2000 out of 44 top ranking countries of the world, the productivity/animal/lactation in India was 917 Kg with its 35th ranking. So there are a lot of opportunities to improve milk productivity of Indian cattle and buffalo. Animal breeding will be the most important tool to improve milk productivity. Selection of best animals as parent for the next generation is the key to produce high producing animals. Genetic disorder is one of the major hurdles in livestock sector. Complex vertebral malformation (CVM), bovine leukocyte adhesion deficiency syndrome (BLAD), bovine factor XI deficiency, deficiency of uridine monophosphate synthase (DUMPS) and bovine citrullinaemia are some of most important genetic disorders which should be investigated in Holstein and its cross. The overall artificial insemination coverage is less than 30 per cent, this level should be increased. Semen of pure breed and specific cross should be available as per the interest of the particular region. Breed society should be encouraged for the improvement of important breeds. So a package of programme is needed for improvement in productivity of Indian bovine population.

## Technical Enhancement for Potato Productivity

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Potato is one of the most important vegetable crops in India and Agra district of Uttar Pradesh is leading state in its area and production in the country but the poor productivity is major cause of concern. Wide technological gaps in adoption of improved production technologies and other socio economic factors led to low potato productivity in India. Being the important vegetable crop in India, a sound research and extension programme is being under operation in many of potato growing areas. The demonstration of improved package of practice in terms of comprehensive nutrient management including the micro nutrients and integration of organic and inorganic nutrient sources result in enhance potato productivity. The other factor of production like efficient irrigation scheduling, integrated weed management and plant protection and more importantly use of improved high yielding, stress (biotic and abiotic) tolerant newly released varieties are some other crucial demonstrable technologies to realise high potato productivity. Improved potato varieties are one of the most important factor, results in maximum increase in productivity. The improved technologies are being successfully disseminated among the farmers through front line demonstration. Active participation of farmers with subject matter experts in demonstrating improved agro techniques at the farmers' fields will definitely increase potato tuber yield to higher level. In this background, the KVK, RBS College, Bichpuri, Agra conducted FLDs on improved agricultural technologies of potato crops in scientific manner at farmers' fields during the year 2004-05 and 2005-06. From the results of FLD's , It could be concluded that the existing vast extension and technological gap can be packed to a large extent through the front line demonstration and by showing the scope of potato productivity enhancement at farmer's field and resulted in enlightening the knowledge of the farmers. The study clearly revealed that demonstration at farmer's field resulted in more knowledge of improved package of practices among the farmers.

More number of framers can be benefitted by conducting need based frontline demonstration, which ultimately result in increasing overall production of potato in the state and bring food security.

## An Investigation on Accumulation and Volatilization of Pentavalent Arsenic by Fungal strains

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Arsenic (As) has been recognized as an environmental toxicant. Accumulation of As in agricultural soils and consequently in food chain results in deterioration in the quality of agricultural products and eventually damage of human health. Fungi in particular are able to accumulate this metal (loid) s into their cells. Over a century ago, As biovolatilisation by a fungal strain *Scopulariopsis brevicaulis* was first obtained. The main objective of this work was to measure the bioaccumulation and biovolatilisation of As by two isolated As-resistant fungi under in-vitro conditions. Ten pure fungal isolates were obtained through enrichment culture in PDA medium (arsenic enriched) and was observed that all the isolates could grow and withstand the arsenic toxicity upto 500 mg l<sup>-1</sup> of AsV. Two isolates could grow in media containing 700 mg l<sup>-1</sup> of AsV (AsF-02 and AsF-08) were selected for further study. Based on microscopic morphology AsF-02 identified as a species of *Penicillium* and AsF-08 identified as *Aspergillus*. After incubation for 5 days *Penicillium* and *Aspergillus* showed the arsenic accumulating efficiency of 14.3 µg/g and 11.2µg/g from arsenic enriched media. Arsenic bioaccumulation was higher in case of *Penicillium* than in *Aspergillus*. Fungal strains, isolated from contaminated soils were assessed for their ability to produce arsine. After 10 days of cultivation, the amount of As captured on the filter paper in case of *Penicillium* sp. and *Aspergillus* sp. were 22.6 ppb and 18.9 ppb respectively. This result indicated that *Penicillium* and *Aspergillus* were capable of volatilizing As from an environment. In the present investigation, the As-resistant fungi *Penicillium* and *Aspergillus* are found to have the capability to accumulate and volatilize As in considerable amount, such accumulation of heavy metals by fungal biomass may be particularly relevant because of its potential low cost application in bioremediation.

## Reserve Carbohydrate Status as a Determinant for Bearing Behaviour and Yield in Mango

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Erratic behaviour in bearing habit and poor productivity of mango is a serious problem. An investigation was conducted to study the effect of canopy management through judicious pruning and hormonal regulation of mango trees on the bearing habit and yield as well as the reserve carbohydrate status at various parts of the plants. In the present study either of the three types of pruning operation, namely, complete delimiting at the depth of 50 cm.(M1), alternate delimiting (M2) and center opening (M3) was imposed on the mango trees either after harvesting of fruits in the month of July (T1) or during rest period just before emergence of new growth in the month of September (T2) along with (P1) or without (P0) soil application of a growth inhibitor, anti-gibberellin in nature, paclobutrazol @ 10 ml./plant in the month of September. Altogether there were 13 treatments (M1T1P0,

M1T1P1, M1T1P1, M1T2P1, M2T1P0, M2T1P1, M2T2P0, M2T2P1, M2T2P1, M3T1P1, M3T2P0, M3T2P1) including control. Center opening appeared to be the most effective pruning operation for enhancing both yield and reserve carbohydrate status of the mango trees. Paclobutrazol treatment also appeared to have the potential to straighten the erratic bearing behavior and to enhance the yield as well as reserve carbohydrate status. The results strongly supported the hypothesis that the reserve carbohydrate status of plant before flowering is a potent determinant for bearing behaviour and volume of yield of mango. Highest yield and highest sugar and starch levels in leaf and bark of the terminal and penultimate branch were obtained in the plants pruned in the month of July by center opening method and treated with paclobutrazol @ 10 ml./tree in the month of September.

## Adoption of Improved Production Technology of Soybean

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Soybean has great potential as an exceptionally nutritive and very rich protein food. Its cultivation is being preferred by the farmers due to its assured performance under aberrant weather conditions, ease in cultivation, low input requirement and wider adaptability to climate and soil conditions as well, but still its productivity is very low and there could be a number of factors, which may be associated with the low productivity of the crops. Some of them are: nutrient imbalance in soils and imbalanced use of fertilizers lacking integrated approach, heavy weed infestation, incidence of several diseases and pests and non-use of proper management measures, paucity of quality seed of improved varieties, poor drainage etc. Lack of initiative in reorientation of crop management to combat the effect of altered weather pattern, particularly untimely onset and distribution of monsoon and elevated temperature during crop growth period, consequent upon Global climatic change are also some of the factors for failing in optimizing the yield of crops. KVK Indore planned and conducted several on farm tastings to assess the suitable production technology for soybean and front line demonstrations to popularize the assessed technology in a large area. Present study shows the results of the front line demonstrations in improving soybean productivity. A number of 207 demonstrations were conducted by KVK Indore in an area of 77 ha during last 10 years on different production technologies viz. integrated nutrient management, integrated pest and disease management, integrated crop management, water conservation and resource conservation technologies. Results of the study showed that under rainfed and mono cropping situation, the demonstration yield of soybean was recorded 28.31 percent higher as compared to the yield under farmers' practices. It was estimated that the production of soybean in Indore district can be enhanced by approximately 45 thousand tones by adopting all the improved production technologies.

## Eco-friendly Approaches for Sustaining Agro-ecosystem in Mining areas of Neyveli

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Neyveli Lignite Corporation is a leading Mining and Power "Navratna" company. The company "Corporate Social Responsibility" (CSR) philosophy- aims to maximize its contribution to the Sustainable Development of

the locality in which it operates. Its mission is to play an active role in the society and be sensitive to emerging environmental issues. To facilitate the accomplishment, the CSR activities/projects are individually targeted to benefit the surrounding villages at the grass-root level in terms of creation / value additions to the Common Resource Properties (CRP) as well as the village population by overall Human Development. The Ecosystem interventions by mining activities include Land, Water, Air and others. To sustain the ecosystem by the Land based interventions, NLC is practicing , reclamation of Mined out area, stabilization of slopes of over burden dumps, nourishing the backfilled soil by applying site specific amendments then Afforestation, growing crops like Paddy, Ragi, Bajra, Ground nut, Banana coconut, fruit trees and vegetables. To sustain the water ecosystem by the adoption a tailor made high-tech surface and ground water management which include creating artificial recharge structures, construction of an artificial lake in afforestation area, construction of check dams, percolation wells, suitable drainage arrangement and providing water to villages for Agricultural purpose. The pollution control measures include air quality monitoring & management, control of dust, noise/voice pollution, green belt plantations near storage bunkers. The other agricultural activities include development of integrated farming system (IFS) and preparation of vegetation map for the project area. NLC also plays a lead role in the disaster management by providing needed help during the times of flood and drought.

## Removal of Chromium from Waste Water by Adsorption using Low Cost Agricultural Biomass as Adsorbents

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The study was aimed at efficiency evaluation of non-conventional low cost adsorbents such as Fly ash powder, Bagasse, W.Straw Dust, SD, and Coconut coir as compared to the powder activated carbon for the removal of chromium from aqueous solution. The efficiency of the adsorbents for the removal of chromium was investigated. The efficiency of adsorbent used is found in the order of PAC>Bagasse>FA>SD>WSD>Coconut coir. The effect of chromium solution PH,contact time ,adsorbent dosage, initial chromium concentration and adsorbent meshsize on adsorption were studied in a batch experiment. Fly ash, Bagasse, W.S.D, SD, &Coconut coir were the most active at pH-6 , which is closer to pH of chromium bearing industrial waste as compared to the pH 2.0 of PAC. The equilibrium data for the adsorption of chromium were analysed in the light of Langmuir and Freundlich isotherm models. The ultimate adsorption capacity for the adsorbents PAC, Bagasse,FA, S.D., W.S.D & Coconut coir found out are 4.97 mg/gm, 4.91mg/gm, 4.90mg/gm, 4.89 mg/gm, 4.77mg/gm and 4.56 mg/gm respectively by column studies.

## Drying Characteristics of Spinach in Solar Tunnel Dryer

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The mechanical drying involves higher cost of drying and open sun drying deteriorates the quality. Thus, the need for an intermediate level technology was realized and an effort was made to develop a small scale solar tunnel dryer (STD). Drying of spinach (*Spinacia oleracea* L.) is carried out to analyze the performance of the

dryer and to study its drying characteristics. Spinach is highly perishable and one of the most important leafy vegetables widely used for culinary purpose. STD temperature was 15-17 °C higher than ambient air temperature. In month of February and March the range of STD temperature and relative humidity was 30-47 °C, 20-52 % and 40-55 °C, 14-50 %, respectively. The spinach was dried from initial moisture content 88.21-94.04 % (wb) to final moisture content 3.50-5.13 % (wb). Total drying time was in range of 6.3 h to 10.0 h. The drying time considerably reduced as compared to open sun drying of spinach as sun drying took 15 h for drying. The dehydration ratio of the spinach varied from 9.083 to 21.177.

## Availability of Micro Nutrients and their Indexing for Some Rice Growing Soils

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Micronutrient deficiency in Indian soils has emerged as one of the major constraints to crop productivity. A study was conducted to know the availability and indexing of micronutrients viz. zinc, copper, iron, manganese and boron in soils of Hooghly, West Bengal. Two hundred and fifty soil samples were collected at 3.5 km grid and analyzed for DTPA extractable Zn, Cu, Fe, Mn and hot water soluble B and other important physico-chemical properties. Results showed that, the soils were mostly acidic to neutral in reaction with medium to high in organic carbon. The available Zn, Cu, Fe, Mn and B content of the soils ranged from 0.05--13.16, 0.64--18.48, 27.16--454.20, 4.52--207.5 and 0.03--2.37 with mean value of 1.80, 8.20, 206.28, 45.63 and 0.70 mgKg<sup>-1</sup> respectively. On average the soils were low in available B, medium in available Zn and high in available Fe, Mn and Cu and their nutrient index values were 1.13, 1.84, 3.00, 2.84 and 2.99 respectively. 4.4% and 22.8% of the soil samples were deficient in Zn and B respectively. Iron and Mn content, on the other hand, recorded high values. Simple correlation study showed that there was negative non-significant relation of available soil Zn and B with pH, whereas Fe and Mn showed negative but significant relationship. Available soil Cu showed positive significant relation with soil pH. Available soil Cu and B showed positive and significant correlation with the organic carbon, whereas available Fe recorded negative but significant correlation.

## Factors Affecting on Adoption of SRI System of Paddy Cultivation

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Rice is the staple food crop of India, providing 43 per cent of caloric requirement for more than 73 per cent of Indian population. The average annual population growth rate of 1.5 per cent and per capita consumption estimate of about 400g of rice per day, demand for rice is expected to be 100 million tons during 2010 and 140 million tons by 2025. The demand can only be met by maintaining the increase in productivity under decreasing trend of land availability and total factor productivity and has to meet the demands for sustainability and preservation of environment quality. Assembly of the practices that culminated in SRI began in the 1960s based on Fr. de Laulanie's observation of 'positive-deviant' farmer practices, starting with planting single seedlings instead of multiple seedlings in a clump, and not keeping irrigated paddy fields flooded during the rice plants' vegetative

growth stage. Keeping this in view the study was designed to find out the extent of adoption of recommended practices of SRI technology of paddy cultivation and relationship of the characteristics of paddy growers with their level of adoption.

## Status of ICDS of Anganwari Centers of Firozabad (U.P.)

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Anganwari is an integral part of the Integrated Child Development Services Programme to combat child hunger and malnutrition having focal point for the delivery of services at the Community Development to the block level children below six years of age, pregnant & nursing mothers and adolescent girls. Anganwari centers also serves as the meeting place for women's group and Mahila Mandal promoting awareness and joint action for child development and empowerment of women and children. Present investigation is made to assess the existing status of Anganwari in selected slum areas situated in Firozabad District. Stratified random sampling technique is followed to make a representative sample of 100 respondents. The data was collected with the help of structured interview schedule / questionnaire specially prepared and analyzed statistically. It has been observed that majority of women shows that most of the Anganwari provide the supplementary nutrition to the beneficiaries. (92%) of the worker did home visit and small meeting organized in Anganwari centers, whereas, (88%) of the women stated that services for women were provided to pregnant and lactating women and (94%) reported that services to below 2 years children were provided at Anganwari centers. Most of the respondents have opinion that women training organize in time (64%), home visit one hour daily (74%), yearly progress report (54%), immunization for children and mother (94%) all beneficiaries received services at time (94%), use mass communication for spreading health and education (96%), whereas, 80% respondents stated that working hour daily, (64%) supplementary food provided occasionally were not available at the Anganwari centers. It is suggested therefore awareness among people related to ICDS should be encouraged. Apart from basic equipments, kitchen & bathroom equipments should also be provided at Anganwari centers.

## Efforts of Krishi Vigyan Kendra to Improve Socio-economic Status of Brinjal Growers

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District Korba of the Chhattisgarh State is predominantly comes under acidic soil zone. Only few of the crops particularly in rabi can perform better under such soil condition. Brinjal, is one of the most suitable crops that can perform well even in high acidic soil with pH 4.5 to 5.0. This crop has more than 2000 ha area in the district. Majority of the vegetable growers in this district growing it since long. During Participatory Rural Appraisal (PRA), it was observed that majority of the farmers were facing problem of Wilting in Brinjal causing significant reduction in plant population and ultimately very low productivity due to heavy yield loss. This disease, sometime affects to more than 50 per cent plant population. The results were very encouraging. Under this

programme, farmers were very satisfied to get up to 40 percent more yield from just replacement of traditional brinjal variety by MuktaKesi. Therefore, in order to promote this variety, during 2010 Mukta Kesi variety was again taken by the KVK in farmers field under FLD programme. The demonstrated technology soon popularized amongst vegetable growers, as they could be able to obtain 45 percent more yield and 122 per cent higher net return by adoption of this technology. Vegetable growers are quite satisfied with the results and they have now planned to grow only wilt resistant variety in forthcoming season. This will not only helpful to fill the gap between demand and supply of the brinjal, but also encourage them to improve their socio economic status.

## Physico-chemical Quality of Kulfi

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The samples of kulfi marketed in different zones of Agra city and prepared in the laboratory as control samples were examined and analysed for various attributes of sensory and chemical quality. The control samples prepared in the laboratory were superior in sensory quality viz. colour, flavour and body and texture and in chemical quality viz. Acidity, pH, T.S fat, protein, lactose, sucrose and ash, to the market samples of different zones. It is concluded from present investigation that control samples prepared in the laboratory were superior in all respect of sensory and chemical attributes than market samples of different zones. A good quality kulfi could be made using the milk of good quality buffalo milk, adding sugar, stabilizer in proper ratio.

## Effects of Some Primary and Micronutrients on Yields of Rice under Terai Alluvial Situation of West Bengal

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An experiment was conducted with rice (Cv. Gotra Bidhan 1) in soils of Terai alluvial situation of West Bengal to find out the effect of some primary (N-P-K) and micro (Zn-B) nutrients along with organic matter on the variability of yield of rice. The treatments were based on the soil-test based fertilizer recommendation. Maximum grain yield of rice was obtained at the optimum application of the given nutrients. Omission of nutrients from the optimum caused yield losses from 9.9 to 47.1%. The yield losses (45.5%) were relatively much higher where only FYM was applied and highest at T10 (47.1%) where the plants were allowed to grow on the native nutrient status of the soil. The significant difference in yield was observed among the optimum level of application of nutrients, State recommendation and farmers' practice. The yield data also revealed that N-P-K-Zn and B are the main limiting factors under the present experimental set up. The marked change in uptake of nutrients at panicle initiation and at maturity of the crop and a little build up of nutrients (N-P-K-Zn and B) in soil were apparent. This results suggested the need for applying the given limiting nutrients at optimum levels for the successful yield maximization programme.

## Status and Opportunities of Vanilla Cultivation in West Bengal

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Vanilla, a native of Mexico and Central America, is known as the 'queen of aromatic spices'. Recently the large, small and even the marginal farmers are being attracted to cultivate vanilla as the crop very much remunerative and can be accommodated under the popular plantation crops like coconut, arecanut, coffee and coco, in India. Vanilla being a shade tolerant crop offers a great scope for cultivation in the coconut gardens as it cannot withstand full sunshine and requires filtered sunshine to the extent of 50%. Vanilla under Orchidaceae family, is grown for commercial production of 'Vanillin' (aromatic flavour) having wide use in flavouring icecreams, bakery products, soft drinks, beverages, custards, puddings, confectioneries and preparation of vanillin oleoresins. In West Bengal, commercial cultivation of Vanilla can be successfully done in several districts enjoying hot and humid climatic conditions which are equally good for coconut, arecanut, etc cultivation requiring very little investment. It is estimated that nearly 300 tonnes of Vanilla beans is used in USA every year in the preparation of cola type drinks. As there are very little information available in this regard, the present papers is an attempt to study the economic feasibility of Vanilla cultivation as a mixed in the plains of West Bengal.

## Weather Forecasting Using Novel Models of Artificial Neural Networks

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There has been significant development in weather forecasting models. Some popular forecasting techniques are moving averages and smoothing methods, time-series analysis, regression analysis, etc. To overcome these drawbacks of traditional methods, the use of intelligent systems for weather predictions has been widely established. Artificial neural networks may be more suitable for this task. They are trainable tools that attempt to mimic information processing of the central nervous system. An artificial neural network requires no assumption prior to forecasting. Furthermore, a neural network has the ability to extract useful information from large data sets. There has been a great interest in the field of neural networks and neurobiological studies from decades. Scientists are speculating the functioning of the nervous system and trying to investigate its working. McCulloch and Pitts developed first mathematical model of a single neuron. This model has been modified and widely applied for different applications. An artificial neuron model can learn all kinds of functions, easy to implement, does not need excessive computation within each neuron. Till recent years, all the neural networks that were encountered for various applications in literature have been based on the models of neurons that were developed when there was no significant knowledge about biological neuronal systems. Past few years have witnessed several dimensions of research in the area of neuroscience as a result of which new models have been developed for the study of neuronal behavior. This knowledge has not been used significantly for improving models of neurons for artificial neural networks. In this paper work, it has been observed that inclusion of more of biological phenomenon improves the efficiency and fastness of neural networks. These neural networks perform better than the traditional ones for weather forecasting. Weather data measured at Pantnagar for five years have been used in this paper work to judge the effectiveness of the proposed methods.

## Spearheading the True Spirit of Apni Mandi- Some Sparkling Cases in Jalandhar Distt.

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There is a lot of difference between the selling prices of agricultural produce by farmers and the retail prices of that very produce. The concept of Apni Mandi was launched by Mandi Board, Punjab where producer come directly to sell their produce in retail. Despite being a good concept it lost its spirit due to one or other factors. Main reason was that farming itself is very exhaustive job and farmers find it tedious to sell after doing the labourious farming operations. Middleman had taken advantage of this also they buy the bulk produce from farmers and sell in Apni Mandies through their agents. But there are few examples of farmers who kept alive the real spirit of Apni Mandies. S. Devinder Singh is selling his vegetable produce in apni mandi and getting 3-4 times more returns. Similarly S Simratpal Singh of Sarakpur (Jalandhar) village opened a sale out let for his produce at his petrol pump and earning 2-3 times more than previous. S Avtar Singh, Nurmahal (Jalandhar) came out in big way he started selling turmeric after processing and his returns become double. Moreover he popularized the turmeric cultivation in the area and running a processing plant of this. In the subsidiary field of agricultutre , s, Jagjit singh of Mithra (Jalandhar) village created example by marketing of honey at their own. He is getting almost three times return than the direct selling to companies. So if determined efforts are taken the agriculture could be more ruminative for the farmers as like as the other business are.

## Indigenous Dairy Processing Technology for Traditional Milk Products in Allahabad District of U.P.

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Dairy enterprise plays a pivotal role in the country's rural economy. Milk and milk products fulfill the nutritional requirements of the people are comparatively cheaper than the other non vegetarian sources. Descriptive cum-evaluatory research design was followed in four blocks of Allahabad district conducted during 2009-10. Two hundred dairy entrepreneurs were selected randomly from 40 villages. The finding infers that the dairy entrepreneurs knew the different processing technology used in making khoa, khoa based sweets, chhena and chhena based sweets manually by dairy entrepreneurs i.e. sweet shop owners only. They were using manual system for producing the indigenous milk products, where as curd, paneer and ghee prepared by small scale dairy entrepreneurs by manual system but only ghee was prepared to some extent by manual's system. However, ghee was also prepared by respondents (21%) separating the cream from milk using separator machine. It was observed that majority of the small scale dairy entrepreneurs were using traditional know-how for making dairy products. It is suggested that the small scale entrepreneurs should be trained on dairy processing technology on scientific lines for making various quality dairy products so that the consumers gate quality products commensurate with the price they pay. It was recommended that the Government and NGOs should provide the latest dairy processing technology to the entrepreneurs for making the business more profitable and to sustain indigenous dairy business in the rural areas.

## Role of English Language for Professional Excellence of Agricultural Scientists

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India is one of the most linguistically diverse countries in the world: the 2001 census recognises 234 classified mother tongues and 22 official languages. Maintaining this linguistic diversity is important, as research has shown that linguistic diversity, biodiversity and cultural diversity are interlinked. However, in a globalized world, where borders have become porous and the whole world is highly connected and interlinked, English has emerged as a world language for career growth of people working in different areas. For this reason, knowledge of English, in addition to the mother tongue, has become essential for the professional growth and development of agricultural scientists as well. A command over English can facilitate agricultural scientists develop a professional identity for themselves and emerge as leading scientists. It can enable them to share knowledge and communicate with national and international scientists; access results of the latest researches; contribute to international literature; edit journal articles; participate in national and international conferences; prepare and design research projects; and apply for fellowships and foreign assignments. In the professional sphere, the main correspondence of agricultural scientists takes place through letters, reports, e-mails, short message services, presentations, academic and social networking sites, videoconferencing and meetings. This paper suggests ways and means by which agricultural scientists may improve their English Language communication skills, which can then prove to be a most reliable and powerful tool for their professional excellence and success at work.

## Knowledge of Integrated Pest Management Practices of Rice Growing Farmers of Jammu Division

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IPM is a complex technology and knowledge intensive. Effective implementation of IPM requires sound understanding of its different practices. To know the impact of IPM-FFS training programmes with regard to the knowledge of farmers regarding IPM technology, present study was conducted. The main objective of the study was to test the knowledge of the farmers about IPM practices in the rice crop. The majority of the farmers had medium level of knowledge of IPM practices. The mean knowledge score of the farmers was 27.76 and S. D. was 8.96. The study indicated that the respondents had low knowledge regarding biological and chemical practices as compared to cultural and manual/mechanical practices. Only 10 per cent of them had known the pest-defender ratio (2:1) numerically. Similarly, ETL was known to a very small percentage of respondents (11%). Majority of the respondents had hardly identified one or two diseases, insect-pests and natural enemies of rice crop. Lack of knowledge of any of these practices would adversely affect its adoption. Therefore, more emphasis should be given to those practices of IPM in the IPM-FFS training programmes where the farmers had little knowledge.

## Socio Economic Profile of Agriculture Students

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Agriculture is an applied science and hence development in cognitive, psychomotor and affective domain is necessary to achieve quality and effectiveness in people, products and profiles through agricultural perspective. The study was conducted among the under graduate and postgraduate agriculture students. Total numbers of respondents were 80 under graduate and postgraduate students. The study indicated that 18.75 percent of the respondents were from rural area whereas 15 & 66.25 percent held from semi urban and urban respectively, more than 52 percent respondents had agriculture as their first choice for admission, 90 percent respondents come from these families whose presents are employed in any organization, size of land holding were 2.5 to 5 acres, 47.50 percent respondents not having any animal species, 51.52 percent had parents monthly income in between Rs. 6000 to 14000 and majority of the respondents were influence by their fathers to go for agriculture education.

## Knowledge and Adoption of Organic Cashew Nut Cultivation

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The study was conducted in Sindhudurg district of Konkan region with a view to know the profile of organic cashew nut growers, knowledge and adoption of organic cashew nut cultivation practices. Information was collected from 30 selected organic cashew nut growers. Majority were of middle age had 'small' land holding. Cent per cent of them were growing cashew nut organically, were growing local varieties, and their main occupation was farming. It was seen that 53.00 per cent farmers were having 'medium' knowledge about organic cashew nut cultivation practices, followed by of 'low' and high level knowledge. Majority (60.00 per cent) of the cashew nut growers were having 'medium' adoption of organic cashew nut cultivation practices, while 23.33 per cent and 16.33 per cent of them had 'low' and 'high' level of adoption, respectively. It is, therefore, recommended to make efforts to impart knowledge and promote adoption of organic cashew nut practices.

## Demonstration of Bacterial Wilt Management in Eggplant Using Antagonistic Bacteria

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Bacterial wilt in eggplant is a serious disease and is caused by *Ralstonia solanacearum*, an important plant pathogenic bacterium causing vascular wilt in many crops. Losses due to the incidence of bacterial wilt ranges from 30 to 100 per cent. Since most of the management strategies have limited success in the control of this

disease, we explored the possibility of employing biological control using bacterial antagonists. Based on the encouraging initial results in the laboratory, glasshouse and experimental field conditions, we selected three antagonistic bacteria for the field demonstration in the farmer's field. In addition one consortium of two antagonistic bacteria was also evaluated. Seven field demonstrations in three vegetable growing villages were conducted. Talc based formulation of the antagonistic bacteria were used in the treatments. Farmers were trained about the method of treatment. Incidence of bacterial wilt and the fruit yield were recorded periodically. Reduced incidence of bacterial wilt was recorded in the biocontrol treated plots compared to untreated control plots in all the demonstrations. Further, it was observed that fruit yield was higher in the biocontrol treatments. Though the number of demonstrations was less, it was observed that the farmers in the neighbouring fields showed interest in taking up the treatments in future as they were convinced about the technology demonstrated.

## Extent of Adoption of Plant Protection Practices by the Farmers in Major Crops

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Agriculture is the backbone of India's economy. It provides employment to about 68.4 per cent of the population in the country and contributes near about 17.8 per cent in national income. It is quite clear that use of plant protection practices are as important as the other inputs used in crop production, In the study, it was found that majority of the respondents i.e. 58.75 percent belong to middle age group of 36 to 50, while 31.25 percent respondents belong to age group of above old age group. About 63.75 percent of the respondent belongs to the other backward caste stratum. The study indicated that majority of respondents (53.75 %) had fair knowledge while 31.25 percent had good knowledge and 15 percent respondents had poor knowledge about plant protection practices in sugarcane crop. Where as majority (63.43%) of respondents have adopted the plant production technology in sugarcane, paddy and wheat crop to high extent of adoption, while incase of mustard and urd respondents have adopted the plant protection technology to the medium extent. Further study also indicated that majority of respondents to have low mass media exposure.

## Personal and Socio-Psychological Characteristics and Their Relationship with Adoption of IPM Practices

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The present study was conducted to identify the personal and socio-psychological characteristics of the randomly selected 240 respondents of Jammu division and to find out the relationship of these characteristics with the adoption of IPM practices in rice crop. The findings of the study revealed that the majority of IPM trained rice growers were literate, above 50 years of age and were not members of any social organization.

Education (0.539), extension contacts (0.226), participation in extension programmes (0.137) and exposure to mass media (0.401) had significant and positive relationship with adoption of IPM practices. Age (-0.365) and occupation (-0.265) were negatively and significantly associated with adoption of IPM practices. Education had exerted maximum direct effect (0.432) and the variable exposure to mass media had highest indirect effect (0.296) on the adoption of IPM practices compared to other variables when put on the path analysis. If possible, select the young farmers for IPM-FFS training programme as they can retain maximum knowledge and adopt the IPM practices gradually. Policies should be framed to improve the educational level of the farmers so that they can easily understand the nature of the IPM technology. Social institutions should be established to increase the social participation of the farmers.

## Effect of Chemical and Cultural Weed Control Method on Yield of Onion ( *Allium Cepa* L.)

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Field experiment was conducted to compare the effect of weedicides with hand weeding during year 2009-10 and 2010-2011 at Krishi Vigyan Kendra, Jamui. Two herbicides; Pendamethaline @ 1kg ai/ha and Oxyfluorefen @ 0.25 ai/ha along with two manual hand weeding ( 25 and 60 days after transplanting) and four manual hand weeding (20,40,60 and 80 days after transplanting) and control (no chemical or manual weeding) were compare for weed control and their effect on the yield of onion. Data recorded on the parameter of fresh & dry bulb yield with and without leaves. From analysis of data it was observed that mean of fresh yield, dry yield and bulb yield of Pendamethaline treated plot produce 31.04, 27.08 and 26.28 tons/ha respectively which is close to the four hand weeded plot which is 30.66, 26.71 and 25.70 tons/ha respectively. Among weed control strategies Pendamethaline and four hand weeding shows almost similar yield means four hand weeding is equally good with chemical Pendamethaline.

## The Yield and Net Income Increase in Rice Among Adoptive Farmers of Uttar Pradesh

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The main aim of the study was to find out the yield and net income in rice among the adoptive farmers in different randomly selected villages of different randomly selected farmer's during 2008-2010 in Ghazipur district of Uttar Pradesh, it was found that yield and net return was increased in rice due to proper scientific approaches. It was further seen that productivity of rice and net return varies from farmer to farmers. This will have made equal from more proper attentions. Proper attention will have to pay the farmers regarding farm planning, budgeting and to maintain of farm records for higher productivity and income.

## Characterization of Inorganic Soil Phosphorus in Some Soils

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Inorganic phosphorus constitutes a major portion of the total phosphorus in the soil and is most important for the P nutrition of the all crops. The inorganic P is mainly composed of the discrete classes of phosphorus compounds namely phosphates of iron, aluminium and calcium in the soil depending on the pH of the corresponding soils. The soils of the Terai-alluvial zone of the West Bengal are acidic, relatively high in organic matter and having light textural class. In these soils the availability of the P is assumed to limit the productivity of the crops due to the predominance of the sparingly soluble Fe/Al – phosphates. Under this background for understanding the fate of soil as well as applied P, the fractionation of inorganic P was carried out in sixteen different soil samples of this zone. The pH of these soils were ranging from 4.80 to 6.95 revealing the acidic nature. The organic carbon status was ranged from 0.45% to 1.13%. The soil texture was sandy loam and the available P was in the range of 9.95 to 33.23 kg ha<sup>-1</sup>. The fractionation of inorganic soil P was done by the standard methods. The perusal of results indicated the least amount of P in saloid fraction with the range of trace to 0.008 mg kg<sup>-1</sup> soil whereas the maximum P was found in iron bound fraction ranging from 56.1 to 254 mg kg<sup>-1</sup> followed by the Al-P fraction which was in the range of 14.2 to 120.1 mg kg<sup>-1</sup> soil. The phosphorus bound to the calcium fraction of the soil was low in the range of 11.8 to 124.6 mg kg<sup>-1</sup> due to the acidic pH of these soils. The less variation of the saloid P amongst the different soil was attributed to less variation of the pH as well as clay content of the soil. The higher value of the phosphates bound to the iron and aluminium can be ascribed to the low pH as well as higher iron/aluminium content of these soils. The computation of the correlation matrix amongst these inorganic P forms with the physico-chemical parameter of the soils revealed that the saloid P was positively correlated with the pH and organic carbon content of the soil whereas the Fe and Al phosphate fraction was negatively correlated with pH ascribing the higher availability of the Fe/Al in the lower pH of the soil. The clay content had the positive correlation with the saloid P fraction and Ca-P fraction but negative correlation with Fe/Al and reluctant soluble phosphate content of the soil. The positive association of the clay with saloid P may be due to the availability of the less absorbing surface for P adsorption. The positive relation of the organic carbon content with saloid P and available P content of these organic matter rich soils may be attributed to the more release of P into easily plant available form from organic matter.

## Quantitative Traits in Advance Generation of Basmati Derivatives

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Fifty two lines derived from IR30 X Basmati 370 cross were evaluated to study the genetic variability, magnitude and degree of influence of the component characters on grain yield. Nine biometrical characters were studied for estimating genotypic coefficient of variation (GCV), phenotypic coefficient of variation (PCV), heritability (broad sense), genetic advance, correlation and path coefficient among themselves. The analysis of variation revealed significant difference among the lines against all the characters studied. High GCV and PCV were observed for grain yield per plant, grains per panicle, panicle weight and panicle number per plant. High heritability was observed for panicle weight, grains per panicle, grain length, grain L/B ratio, 1000 grain weight

and grain yield per plant while panicle number per plant, panicle length and grain breadth had moderate heritability. Grain yield per plant showed maximum genetic advance as percentage of mean followed by panicle weight and panicle number per plant respectively. Grain yield per plant was significantly correlated with panicle number per plant, panicle weight, panicle length, grains per panicle, grain breadth and thousand grain weight in positive direction while it had significant negative association with grain L/B ratio. Grain length imparted highest positive direct effect on grain yield followed by panicle number per plant, grains per panicle and panicle weight while grain L/B ratio showed highest negative direct effect on yield in this regard.

## Assessment of Training on Plant Protection in Opium in Chittorgarh District of Rajasthan

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The opium poppy is most important medicinal plant and is chief source of commercial opium. In chittorgarh district downey mildew powdery mildew stem rot leaf curl diseases cause the significant losses in opium production. For assessment of training the Pre and Post test experimental design was used to study the gain in knowledge by the trainees in plant protection in opium. The training was successful in raising the knowledge of the trainees on different aspects of plant protection to enhancement in knowledge by the trainees with gain in knowledge of 31.31. The maximum gain in knowledge on use of streptomycin (46.51 MPS) followed by Control of boll worm (44.19 MPS), Bacterial disease (41.86 MPS) and minimum gain in knowledge on the Type of crop (6.68 MPS). The Knowledge gain was in powdery mildew (34.88 MPS) and regarding downy mildew.

## Nano-technology: A Means to Build Efficient IC Engines

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With the depletion of fuel resources and increasing contamination of environment around us, the present era is in a desperate need of effective utilisation of fuel resources we are left with now. In this paper we would like to introduce a new method of improving the thermal efficiency of IC engines using Nanotechnology. Till now the maximum practical thermal efficiency is around 34% for an IC engine. In general, the maximum heat loss occurs in cylinder wall section during the combustion of the fuel which is carried away by cooling water and the through the exhaust gases to the atmosphere. Utilisation of this heat is possible with the implementation of quantum dots, which are any materials with all their three dimensions confined to Nano scale. For this purpose we use an assembly called Thermo-electric Nano sheet assembly. This apparatus consists of 8 to 10 Carbon Nano sheets (CNS) stacked together and photovoltaic cells (that have quantum dots in them along with organic dye-coated Titanium dioxide Nano particles to ensure maximum electrical efficiency). These are separated by vacuum in between them. The assembly takes heat from the outer side of the Nano sheets and because of its brilliant thermal properties rises its temperature to emit different radiations. The quantum dots in the photo voltaic cells section absorb this radiation according to the frequency and convert them to useful electrical energy.

As we know that the overall efficiency is the product of all efficiencies, the improvement in the thermal efficiency through this implementation of nanotechnology in IC engine design might result in incredible change in the fuel efficiencies of automobile engines in near future.

## Effect of Arbuscular Mycorrhiza in Wheat Yield in Different Tillage Practices

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A field experiment was conducted to determine the effect of arbuscular mycorrhiza (AM) in different tillage practices to determine the yield of wheat crop and fertilizer response to inoculation with mycorrhiza. Different tillage practices like Bed Planted, Zero Tillage and Conventional method were adapted with or without use of mychoriza. Fertilizer dose in treated seed is half of recommended dose of fertilizer. Mycorrhiza treated wheat shows on an average increase in yield by 17.9% in different tillage practices. In bed planted treated wheat seed yield increases by 17.5% compare to zero tillage treated wheat seed but as compare to conventional method treated wheat seed yield increases by 40.1% and 67.8% increase in yield is recorded compare to conventional method without treated seed. Similarly test weight of wheat is also increase in all tillage compare to conventional method. Test weight of bed planted treated wheat seed increases by 15.1% compare to conventional method without treated seed. No of effective tillers/m<sup>2</sup> in bed planted treated seed increases by on an average 7.7% compare to zero tillage treated seed but compared to conventional method without treated seed increase in effective tiller is by 54%. So mycorrhiza treated seed in bed planted wheat is good for the grain yield production.

## A Study on Statistical Methodology for Estimation of Seed Replacement Rate of Different Crops

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The purpose of study is to study the profile of sample farmers to develop suitable sampling methodology for seed replacement rate in few kharif crop for the year 2009-10 in Milkipur Block of Faizabad district and to find out the best sampling strategy for estimating the seed replacement rate in few Kharif crops like Paddy, Sugarcane, Arhar, Urd and Jowar for the year 2009-10. The primary data for estimation of seed replacement rates for crops such as paddy, sugarcane, Arhar, Jowar and Urd have been collected for investigation purposes during Kharif season 2009-10. The relevant statistical tool and technology for estimation of seed replacement rate based on two-stage sampling design has been used for the purpose. The seed replacement rate for paddy crop has been highest for large farmers (34.61%) followed by medium (32.83%), small (28.16%) and marginal (24.08%) respectively. Similarly these rates have been found for other crops under consideration. Two stage sampling design has been used for finding out the relevant estimates of seed replacement for paddy crop.

## Studies on Evaluation of Okra Germplasm

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Fifteen entries of okra (local and hybrid), collected from different sources of West Bengal, were evaluated for their horticultural characters from February 15,2008 to May 25,2008 at 'C' Block Farm of Bidhan Chandra Krishi Viswavidyalaya, Kalyani, Nadia, West Bengal. The objective of the experiment was to study and investigate the characteristics of all okra entries. Four okra entries i.e., VRO-4, Nirmal 101, Ankur-40 and 5-Dhari were observed to exhibit the best characters in terms of days to 50% emergence at 7 days after sowing (DAS), days to first flowering at 38 to 40 days after sowing, first node of flowering at 5-6.5, first node of fructification and the average number of total fruits per plant at 14.6 to 16.3. Varieties Maharaja, Selection-10, Pankaj Tall and IC-Red had poor characters among the entries; data gathered included days to 50% emergence at 12 to 13 DAS, days to first flowering at 50 to 55 DAS, first node of flowering at 6.7 to 8.7, first node of fructification at 6 to 8, and the average number of total fruit per plant at 6 to 9.

## Crop Productivity and Training Needs of Beneficiary Farmers in Watershed Development Programme

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The study was carried out in NWDPR Solsinda watershed in Indore district of Madhya Pradesh during 2006-07 to assess the crop productivity and to identify the training needs of beneficiary farmers. Two hundred and ten participant farmers were interviewed for the purpose. It was found that there was a significant increase in both Soybean and ragi yield levels of participant farmers. Majority of the respondents expressed the need to train them on in situ moisture conservation, selection of specific crops and varieties, pests and disease control etc. Lack of knowledge regarding the watershed activities was the major constraint faced by the beneficiaries of watershed development programme.

## Impact of Inter-cropping in Disease Management

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Mandarin (*Citrus reticulata* Blanco) is an important crop of Jhalawar district. Owing to dominance of cultivation, the region is known by mini Nagpur of Rajasthan. As per statistics for the year 2009-10, 8492.26 hectare area was under cultivation of mandarin and the production was 160509.79 tonnes. However the orchards in the district are many times in many locality are found infected with diseases like Phytophthora rot, sooty mould and soft rot. An study was made to see the impact of intercropping on the incidence of the disease

(s). For this purpose, covering 22 farmers of different areas of the district a study was made. From the survey and the response as made by the orchard respondents, it appeared that the orchard where garlic was intercropped – disease incidence was minimum. It may be due to presence of sulphur containing aroma compounds; allyl-propyl-disulphide in garlic. The aroma emanated in the nearby environment from the plant might serve as a sheath in safeguarding mandarin from the attack of disease.

## Economic Analysis of Rice-wheat cropping system

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Rice-wheat cropping system is the major cropping system prevalent in the study area. The present study was an attempt on “Economic analysis of cropping system in meerut district of western Uttar Pradesh”. The objective of the study was to know the cost of production and net returns of the cropping system. To meet out the objective meerut district and two block from the district was selected purposively and from these selected blocks four villages, two from each block were selected randomly. On the basis of size of holding from the each village 10 farmers were selected from each village in probability proportion to their population. Therefore, 40 respondents were selected. From the study it was found that employment generated through rice-wheat cropping system was 364 man days per year. The overall gross return per hectare was Rs. 140543.92 and Rs. 143927, 139708 and 137751 was in small, medium and large size of groups and the cost of cultivation in respective size was Rs. 87332, 90472 and 94297 with overall cost of cultivation of Rs. 90920. The average net return was Rs. 49623 and Rs. 56595, 49236 and 43454 in the respective size groups. From the study it was found that gross return was negatively related with the size of farm while cost of cultivation was positively related with it.

## Knowledge Level of Dairy Farming Trainees of KVK

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KVK plays an importance role in training the practicing farmers, rural youth and farm women. A study was conducted in Krishi Vigyan Kendra of TANUVAS at Kattupakkam in Kancheepuram district of Tamilnadu. A total number of 36 farmers out of 132 trainees trained on dairy farming were selected following the proportionate random sampling method, in order to estimate the practice wise knowledge level of dairy farming trainees of KVK. Among 7 dimensions viz., breeding, calf management, feeding, management, clean milk production, disease control and marketing, the level of knowledge with respect to clean milk production was high (93.05 percent). The level of knowledge in feeding and marketing practices was found to be average. The results revealed that the respondents had good knowledge in all aspects of breeding except the knowledge about time of service (75 per cent). Under calf-management, the knowledge regarding naval cord ligation was poor (44.44 per cent). With regard to feeding, the trainees had low level of knowledge about balanced feeding (58.53 percent).

## Socio-economic Conditions of Fishermen in Udgir

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Socio-economic conditions of fishermen in and around Udgir Tahsil were studied during February, 2009 to January, 2010. A questionnaire including socio-economic characteristics such as Name, Age, Family size, Educational status, personal details, family background, literacy, Monthly income etc. were prepared. Total 69 fishermen were interviewed individually at their home as well as at fishing sites of different locations. The study indicate that the conditions of fishermen very poor in terms of the basic amenities of life. Even they do not have their own house or land. During the study, the most important observation found was low income and poor standard of living. Most of the fishermen were lacking basic facilities like drinking water, electricity and others. Some progressive measures like provision of land on lease basis exclusively for fishermen community may be given on long term basis. Financial assistance is required as in case of agriculture tank farmers are given full subsidy. In addition to this, better training for technical knowhow, policies of savings and health insurance etc. are some of the means that can improve the conditions of fishermen to the some extent.

## Credit Utilization Pattern of Youths under Prime Minister Rozgar Yojana

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Unemployment is a global phenomenon, has attained a new dimension especially in a developing country like India, where the problem due to unemployment has become more acute due to the burden of a vast population. The present study was carried out in Gwalior district (M.P.). As per records, 80 credit users who were benefited under the Prime Minister Rozgar Yojana were selected for the study. The success and failure of the scheme largely depends upon the utilization of pattern of the assistance provided to the beneficiaries and many more factors are also affects their credit utilization behaviour. Majority 48.75 percent beneficiaries utilized the assistance received under PMRY in complete manner and they had fully utilized the assistance for productive and specified purpose. Socio-personal traits/factors namely -education, social participation, socio-economic status, credit orientation, extension participation, source of information, contact with PMRY official, attitude towards PMRY scheme ,awareness towards PMRY scheme were found to be significantly associated while age, annual income and cosmopolitaness were found non significant association with credit utilization pattern of the beneficiaries.

## Evaluation of Fitness Status of Rural Elderly People

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Ageing is a normal process begins at conception and ends only with death. Individuals are known to age at different rates. From the study it can be concluded that physiological changes in the body resulting in inadequate

dentition, diminished sensitivity to taste and smell, diminished secretion of hydrochloric acid in the stomach and digestive enzymes, biliary impairment, which interferes fat digestion, irregular bowel evacuation, general ill health, economic and emotional insecurity and unwanted feelings are some of the problems common among old people. Loss of appetite is a common complaint of old people. The elderly population should be encouraged to engage in moderate exercise such as walking and other physical exercise to enhance their quality of life. Strengthening policies and programmes directed towards the improvement of conditions affecting particularly those related to their health and nutrition.

## Assessment of Hybrid Chilli

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A study under on farm trial on “Assessment of HPH-2024” was conducted to assess yield potential of hybrid chilli at farmers’ field in Piprata village of Khargone district during Kharif-2010 under Krishi Vigyan Kendra, Khargone (M.P.). Farmers were using local varieties which were poor in yield and quality. The problem of low yield of chilli was identified through participatory rural appraisal. To overcome the problem, HPH-2024 was introduced and assessed the yield performance and economics.

The data reveals that on an average 293q green chilli /ha yield was recorded in the recommended practice (HPH-2024) as compared to 199 q/ha in farmers’ practice (Use of local varieties) which was 47.06 percent higher than farmers practice. The data on economic parameters reveals that Rs 85932/ha was earned from recommended practice as compared to Rs46295/ha in farmers’ practice. The B: C ratio in recommended practice was 2.42 while it was 1.87 in farmers’ practice. After assessment the yield potential, HPH-2024 is found suitable for cultivation in khargone district of M.P.

## Constraints in People’s Participation in Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA)

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This study was conducted in 10 adopted villages of three selected blocks of Surguja district of Chhattisgarh during 2010-11. A total of 150 respondents were randomly selected from the selected villages for the study. The present study was undertaken to assess the constraints and suggestions in participation in MNREGA programme. The study showed that out of 150 respondents 75.33 per cent had participated in MNREGA programme. Out of them majority (67.25%) of the respondents had involved with 2 to 3 family members in MNREGA programme for the employment. 91.57 per cent of the respondents had reported payment do not gained quickly, followed by 24.05 per cent said payment do not pay in the village was the major constraints faced by them. To overcome the constraints in participation in MNREGA programme, the majority of the respondents (92.40%) suggested that payment should be paid quickly in the village, followed by works should be available over hundred days (16.45%) and information should be available for employment (1.26%).

## Vegetative Propagation of Jatropha

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*Jatropha curcas* L. is getting more and more attention from the scientific community after being officially announced by the Government of India as one of the two potential source of bio-diesel. Vegetative propagules are better option than seedlings for having true to type plants. Cuttings of the *Jatropha curcas* root easily, but proper establishment of the saplings requires well distributed profuse roots around the base of the cutting. An experiment was conducted to standardize the effective vegetative propagation techniques for *Jatropha curcas*. Three kinds of woods (soft, semi-hard and hard woods) of *Jatropha curcas* were tried in three kinds of growing media (soil, soil+F.Y.M and sand). The cuttings were treated with either of the following hormone treatments, NAA @250ppm, 500ppm, 1000ppm; IBA @ 250ppm, 500ppm, 1000ppm; and two commercial hormone formulations, namely, Arodex and Magnate. Observations were taken at 21 days after planting of the cuttings on percentage of cuttings rooted at their bases, sprouted at their nodes, number of sprouts per cutting, number of roots per cutting, number of leaves/cutting, length of new branches (cm.). Hard wood cuttings were found to respond best, whereas sand medium was recorded to be the best rooting medium and IBA @ 250 ppm was established as the best hormone treatment for the production of propagules. Hard wood cuttings treated with IBA and planted in sand medium was the best performing treatment combination.

## Participatory Paddy Varietals Selection for Salt Stress Condition

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Salt stress (Salinity) is one of the worsening problem in low-land areas in Pratapgarh, U. P. The buildup of salt as a consequence of the excessive use of irrigation water with improper drainage, coupled with the use of salty irrigation water or sodic soils developed from salt-bearing rocks. Paddy crop is suitable for rehabilitating these soils because of its ability to grow under flooding and its high potential for genetic improvement. Paddy productivity in salt-affected areas is very low (less than 1.5 t/ha) but can reasonably be raised by at least 2 t/ha (Ponnamperuma 1994), Salt-tolerant Paddy varieties also offer great potential to grow in marginal lands, which are usually left fallow particularly during the dry season because of high salinity. Selection of suitable Paddy varieties for saline prone areas, under farmer's participation mode is directly involved to choice varietal as it suit. Five salt tolerant improve genotypes was grown in trials of participatory variety selection (PVS) in five replications. An experiment was conducted in farmers fields with farmers participation based on their needs have helped to identify high yielding varieties for their lands. The perusal of data reveals that, out of five selected salt-tolerant varieties, two (CSR-36 and NDR-359) have shows significantly higher grain yield resulting in to the higher adoption by the farmers. Therefore, these two varieties may be recommended for further extension to improve the production of rice under salt stress condition of district Pratapgarh.

## Cultivation of Vegetable on the Land Embankment (*Ail*) in the Low Lying Areas of Bongheri

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During kharif season, stagnation of rain water in low land situation inhibits the vegetable cultivation in the Bongheri village, considered under NICRA Project under Kultali Block of South 24-Parganas district. At the same time, delayed release of lands after kharif paddy hinders the vegetable cultivation during rabi season. To overcome from this situation, through NICRA programme a peripheral canal was dug out and the earth was added to the existing land embankment to make it 3 ft. height and 5 ft. width creating the opportunity of vegetable cultivation during kharif season with almost no chance of submergence. By providing live saving irrigation during rabi season, crops like – Tomato, French bean etc. were also cultivated on that land embankment where optimum moisture condition comes earlier than low land with almost no salinity problem. The experiment revealed that with this process an additional net of profit of Rs. 41,550/- to Rs. 43,550/- over traditional practice was achieved in a year from the land embankment surrounding 1 ha of land with BC ratio of 2.07 showing the profit maximization potential of the technology.

## Efficacy of Insecticide against Aphid in Mustard

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A study was undertaken at Krishi Vigyan Kendra, Kalakankar, Pratapgarh during *rabi* season from 2006 - 2011 to evaluate the effectiveness of some IPM tools for the management of Aphid (*Lipaphis erysimi* Kalt) in mustard. The study revealed that use of Imidaclopride reduced Aphid damage significantly. Significantly less siliqua damage was observed in mustard crop. Increase in yield was reported in Imidaclopride treatment over untreated control ranged from 16.26 to 18.5 qt/ha.. It ranged from 14.4 to 30.2% in Imidaclopride. Significantly the highest yield (19.8 qt/ha) obtained from Imidaclopride sprayed plots. The highest net income (52090/ha) and marginal benefit - cost ratio (8.25) was recorded from Imidaclopride. Hence, it might be concluded that Imidaclopride is the best tool in managing Aphid (*Lipaphis erysimi* Kalt) in mustard considering efficacy, profitability and environment friendly.

## Baseline Susceptibility in Brinjal Shoot and Fruite Borer Populations

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Brinjal fruits damaged by the brinjal shoot and fruit borer were collected from ten locations representing North Karnataka during Kharif 2009 and 2010. The adults emerging from the collected damaged fruits were allowed to mate using standardized rearing techniques in the laboratory. Eggs collected from mating cages were

allowed to hatch and neonate larvae of these field -collected parents were used in bioassays to determine susceptibility to the Cry1Ac protein. Bioassays involved exposure of neonate larvae to various concentrations of diet incorporated with the Cry1Ac protein that produced 0-100% mortality. A stock solution (250 µg/ml) of Cry1Ac was made in 0.2% agar solution and dilutions were made in deionized water. The source of Cry1Ac protein used in the bioassays was the commercial formulation, MVP II® (Mycogen Corp., USA), which contained 19.7% (by weight) Cry1Ac protein. Neonates exposed to Cry1Ac concentrations were kept in dark at a temperature of 26±1°C and 55 -65% RH. Larval mortality and instar stage of surviving larvae were recorded on 7<sup>th</sup> day in diet-incorporation assays. Larvae that did not move when disturbed were considered to be dead. The probit analysis (Finney 1971) of mortality data from Cry1Ac bioassays was done using EPA Probit Programme version 1.5. It is observed that the populations have 1-4 fold variability (0.026-0.104 ppm) in their level of susceptibility across the locations. Of the populations studied, Bijapur population recorded highest LC50 value of 0.104 ppm followed by Bellary and Belgaum. Whereas, Koppal recorded the lowest LC50 value of 0.026 ppm. The results were found to be consistent for both the years. The susceptibility to Cry1Ac among ten populations of the fruit and shoot borer observed in this study indicates limited variability.

## Introduction of Salt Tolerant Vegetables in the Nutrition Garden for Attaining Nutritional Security in the NICRA Village

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Nutritional Gardening is a way to attain food and nutritional security at household level but in the critical diverse risk prone area of Sundarbans, the food and nutritional security at household level is badly affected when the region is inundated by the saline water from river, estuaries, creeks and canals due to frequent storm and flood. Keeping in view of climate change and its effect on increasing salinity of the soil, some salt tolerant vegetables like Bitter gourd, Basella, Ash gourd, Bottle gourd, Ivy gourd and Amaranthus were introduced during kharif season in the nutritional garden at NICRA village, Bongheri under Kultali Block of South 24-Parganas district. The salinity level ranged from 1.48 mS/cm to 4.6mS/cm. Among the crops, Basella performed best in high saline condition (avg. 2.3kg/sqm) followed by Ivy gourd, Amaranthus, Bottle gourd & Ash gourd in a crop duration of 3months. Bittergourd performed well in moderate saline condition, but in high salinity its performance was not good. Ivy gourd is a stress tolerant, nutrient rich and perennial crop but within the span of three months its' performance was not judged properly. By introducing above mentioned crops it has been observed that the availability of vegetables in the daily diet was increased which in turn improved the nutritional status of the rural people.

## Nirbheek- Suitable Backyard Poultry Bird for Sundarbans

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Eccentric Climatic and weird nature force the farmer to face calamity to production. Thus to combat such situation and to increase the additional income, the back yard dual purpose poultry may be an alternative livelihood

option for the poor rural people. Thus 'rural development' using backyard poultry as a tool in the Bongheri village of Kaikhali, Sundarbans under the project "National Initiative for Climate Resilient Agriculture", ICAR was undertaken with an aim to compare the performance of local backyard poultry breed (Rhode Island Red) with genetically engineered dual purpose poultry bird- Nirbheek. This Nirbheek is characterized by lack of feather on its neck region resulting to hot and humid climate tolerance by fast and more heat dissipation. This study documented that RIR had an average egg production of 235 nos weighing average 45 gms/egg, whereas Nirbheek had this number 225 and weight was 40 gms/egg. Both the bird showed similar production but only difference was that RIR had a disease incidence of 21.5% where as in this case of Nirbheek it was 13.5%. The mortality percentage was found 7.6% and 5.2% during summer and winter respectively in case of RIR whereas it was 3.1% and 2.3% in case of Nirbheek. Thus considering overall performance the study suggested to promote Nirbheek as backyard poultry farming for this agro-climatic situation as a component of Climate resilient agriculture.

## Effect of Spacing, Age and Water Regimes on Emergence Pattern of Weeds in Transplanted Rice

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Rice is the most important cereal crop and its rank 1st in India. Its plays a vital role towards household food security. Weeds are a major problem in rice cultivation and reduced the yield of rice drastically. An experiment was conducted to study the emergence pattern of weeds in transplanted rice in the kharif season 2009 and 2010 at KVK Farm Science Center, Kaushambi. The experiment was laid out in factorial randomized block design with eight treatment combination with three replications. There was combination of three factories viz i) Spacing – 20 X 15 cm and 25 X 25 cm ii) Seedling age, 18 days and 21 day old seedling. iii) Water regimes, continuous flooding and alternate flooding with drying. The results observed that the 21 days old seedling when transplanted at closer spacing 20 X 15 cm with used of continuous flooding was observed most effective treatment to control the emergence of different types of weeds and produced higher yield of rice over the other treatment combinations.

## Response of Maize to Various Levels of Nitrogen and Potash under Different Seasons of Planting

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Maize is the third most important food grain crop after rice and wheat. It is called the 'Queen of cereals' maize is the high value crop providing on an average 11% protein 69% carbohydrate 3.6% fat and 1.5% mineral matter per 100gm edible protein (Rai 2002). The average yield of maize in Uttar Pradesh is about 14.99 qt/ha. while the yield potential of maize of improved varieties are nearly 80 - 100q/ha. Thus a huge gap exists, which could be bridged by improved GM varieties and improved cultural practices. For maximizing the yield a balance between the nutrients to be supplied through fertilizer should be maintained. Nitrogen in required amount is

known to increase the plant height, dry weight of the crop, no of grains and grain weight. Potassium balance is necessary to maintain the metabolic process in the plant and potassium deficiency has been reported to affect leaf water content, photosynthetic activity etc. Maize being C4 plant required bright sunny days for maximum yield. But the crop and its varieties being photo and thermo insensitive can be grown throughout the year. However the same variety performs differently in different cropping seasons. The present study response of maize cv Ganga Safed-2 to various levels of Nitrogen and potash under different seasons of planting were conducted in the year 2009- 10 and 2010-11 at KVK Farm Science Center, Kaushambi with the objective of to find out best planting season, levels of nitrogen and potash for maximize the production of maize. The study consisted of three levels of nitrogen (80, 120 and 160 Kg/ha.) in combination with three level of potash (40, 60 and 80 Kg/ha.) under three season (Kharif, rabi and zaid) in both the years. The present study indicates that the best best season for higher yield of maize in rabi season with the fertilizer dose 120Kg Nitrogen + 50 Kg Phosphorus + 80 Kg/ha Potash for kaushambi district which would ensure better growth and higher yield.

## Environmental Pollution and its Harmful Effects on Human Health

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Environmental pollution is now a day's world wide problem. Pollution not only causes deterioration of environment and creates health hazards but also caused loss to the national economy. With the increase of population pressure, urbanization and industrialization but unfortunately it also brings some undesirable effect at local, national and global level. Therefore, a study was conducted on city dwellers of Varanasi, Ganga river bank. Selection of respondents were purposively as the maximum area covered by the different ghats. The size of sample is 120. Among 04 ghats, ghats were selected where main drain fall in the river.

The finding revealed that majority of respondents (41.6%) said vehicle are responsible for air pollution, incase of water pollution, in case of water pollution, majority of respondents (58.3%) said sewage responsible for water pollution and majority of respondents (45.8%) said vehicle is responsible for noise pollution. Maximum no. of respondents (75%) said their relatives were suffering from health hazards. Out of it, majority of (50%) people were suffering from digestive problem. Maximum number of respondents said, polythene is not bio-degradable, and (50%) people threw 6 – 8 poly bags daily. Majority (95.8%) respondents were said present garbage disposal system of city is poor. Majority (91.6%) of respondents were said eatables are polluted and 91.6% said quality of supply water is bad. In case of view of people over the effects of pollution on health, majority of respondents (50%) were said eye-irritation caused by air pollution, (66.6%) were said gastro-enteritis from water pollution and (70.8%) respondents said slight deafness from noise pollution.

So, it can be concluded that majority of respondents perceived about environmental risk in the form of eye irritation as the major hazards from air pollution, gastro enteritis from water pollution, slight deafness from noise pollution. Therefore, problem of environmental pollution and its management can't be solved by only formulating laws. In this contest environmental education and awareness is extremely important.

## Constraints Encountered in Adoption of Sugarcane Production Technology

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The present study was conducted in District Badaun of Uttar Pradesh. Only one block i.e. C.D. Block, Asafpur was selected purposively covering ten (10) villages. In all 250 respondents were selected, comprising 110 small, 95 medium and 45 large farmers through random sampling method. The primary data were collected with the help of well structured interview schedule through personal interview. The collected data was quantified, classified, tabulated and interpreted with the help of simple parametric and non-parametric analysis. The results clearly highlights that soil erosion under bio-physical constraints, high cost of inputs under socio-economic constraints and non-availability of labour and poor soil fertility under situational constraints were the major constraints being experienced under soil technology; poor knowledge of crop rotation and lack of labour availability, and lack of insect and disease were the major constraints under situational and bio-physical constraints. Regarding fertilizer and irrigation technology, the major constraints being experienced by majority of respondents were chemical fertilizer deteriorate the soil fertility, soil became poor by the use of chemical fertilizer and non-availability of labour under fertilizer technology and in irrigation, lack of canal water, and high cost of diesel were the main constraints under bio-physical and socio-economic constraints respectively. In case of weeding and plant protection technology the major constraints being experienced by majority of the frames of all the 3 groups were “untimely weeding”, “chemical weed control is very costly”, “poor marketing facility”, “non-availability of labour”, and “poor agronomical practice” and more attack of insect-pest, very expensive insecticides, more attack of disease, non-availability of fungicide and poor knowledge of fungicide application were found under bio-physical, socio-economic and situation/operational constraints, respectively.

## Drudgery Reduction through Naveen Sickle for Wheat Harvesting

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After years of being suppressed and exploited women are now becoming increasingly aware of their development. Govt. and NGOs are regularly evaluating their best effort for women’s empowerment and their contribution to national development is growing with each passing days. In every sector women are giving their fruitful participation. As in rural area women plays an important role and work contribution is more then 60% in agriculture i.e. sowing, transplanting, harvesting, weed management, Post harvest management and animal rearing etc. these activities are full of physical work and time consuming also. As result women do not get any leisure time and get fatigue also, due to fatigue loss of physical and psychological productivity outputs and get worse off , so in this concern we introduced a technology for drudgery reduction is Naveen Sickle for wheat harvesting. This study has been done in Village – Gauspur, District- Kaushambi (U.P). KVK, Kaushambi under O F T activity in the year 2009-10&2010-11. The emphasis was on comparative study between old sickle and Naveen sickle (Serrated sickle) and discusses time and energy consumption through observations and questioner method. Result shows that naveen sickle is more suitable to reduce the drudgery and women consume less time and energy.

## Communication Behaviour of Kinnow Growers in Haryana

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The present study was conducted in Sirsa and Hisar districts of Haryana state with 80 farmers as a sample for the study. The major thrust of the study was upon communication behaviour of the farmers in relation to getting information for scientific cultivation of kinnow crop. The findings revealed that majority of the farmers were from middle aged group and from the dominant caste, having high socio economic status and more than ten acres of land, educated up to high school, having farming as their main occupation and they mainly came from joint family setup. The DHO and its officials were the most preferred with a maximum credibility and trustworthiness. The university scientists topped the list of information sources from the point of view of level of satisfaction derived by the kinnow growers.

'Non-availability of quality inputs', 'high cost of insecticides/ pesticides and fungicides', 'inadequate weed control in kinnow production' and 'low production due to unfavorable weather condition' were considered as major constraints by the farmers. The 'absence or scarcity of agro-processing units', 'lack of knowledge of current advances on kinnow production', 'lack of guidance for controlling insect pests/diseases and application of pesticides and fungicides' were considered the most serious constraints by the kinnow growers. All these constraints can be minimized by providing trainings to the farmers and by distributing literature regarding technical know-how to the farmers as it requires specialized skills in certain operations. The facility of modern communication technology can also play an important role in mitigating these constraints.

## Performance of Flood Tolerant Rice Variety (Swarna Sub-1) In Different Submergence Areas Of Bihar

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On one hand, continued depletion of natural resources, persistent technological stagnation and looming climate are posing serious threat to agriculture while on the other side vast potential area of submergence and flood-prone, are lying under exploited. The recent strategy for reducing poverty and hunger through enhancing food security and improving livelihood of farm families lies on the development and dissemination of high yielding varieties that are flood tolerant. In this regard, International Rice Research Institute (IRRI) with collaboration of NARES partners has made considerable progress to develop certain rice varieties, which are found flood resistant. Out of which SWARNA SUB-1 is most promising rice variety, which has shown excellent result on farmer's field under flash flood condition of Eastern India. The paper examines the importance of the situation in details with reference to Bihar state and highlighted the performance of this variety along with the farmer's perception in different submergence areas of the State. Based on experience and lesson learnt now, there is urgent need to develop appropriate farmer's centered seed production and delivery mechanism strategy for rapid and targeted dissemination of this variety among the resource poor farmers who are residing in flood- prone, condition of South Asia.

## Role of Women in Dairy Husbandry Practices

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The present study was conducted to know the role of women dairy husbandry practices in Beed district of Maharashtra State. A simple random sampling technique was used in the selection of dairy farm women. The total sample constitutes 150 dairy farm women, 10 from 15 randomly selected villages of Ambajogai Tahsil. The selected respondents were interviewed personally with the help of a pre tested and well structured interview schedule to elicit information. It is observed that majority of the respondents were actively involved in various aspects of dairy farming activities including general live stock management, feeding of livestock, breeding the live stock, health care and processing and preparation of milk and milk products etc. They offer more involvement in following dairy husbandry practices like care of new born calf, cleaning of animal shed, cleaning of utensils, storage of concentrates, feeding young calf, diagnosis of common disease and care at home level, care of sick animals, watering the live stock, offering the concentrate mixture, soaking the concentrate mixture, care during pregnancy, disposal of infected litter materials, grooming, cleaning and bathing buffaloes and cows, compost preparation, processing and preparation of milk products, milking of animals, grazing the livestock, feed preparation, weaning and management of calf, chaffing the fodder, vaccination and deworming of live stock, harvesting fodder crops, purchasing of veterinary medicines and carrying the harvested fodder .It is also concluded that the participation of women was less in money transaction like maintenance of account financial records, maintenance of farm records, involvement in banking process, involvement in dairy co operatives, purchasing of equipments and purchasing and sell of animals.

## Risk Perception, Social Amplification of Risk and its Measurement in Agriculture Sector

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Risk evolves in various forms, at various levels, in various sections of society and in various sectors of human activity. Same holds true for the agriculture sector, farming community and the entire human race as a consumer of agriculture products and services. Even though technically risk is estimated as a product of probability of risk event and intensity of risk, there is universal acceptance of risk at same intensity. Behaviors of individuals and groups then generate secondary social or economic impacts while also increasing or decreasing the physical risk itself. This theory derives its content and idea mainly from the field of communication studies. It highlights the role of media and its message content, treatment and handling on the risk perception, risk amplification and risk attenuation. The case of Chernobyl nuclear disaster, Alar medicine tampering and Mad Cow disease are the classical examples for existence of social amplification process and role of media in this process. Hence the information flow, individuals psychological, social and other cultural factors are the important determinants of risk perception. This importance necessitates conducting quantitative and qualitative research in measurement and understanding of risk perception. Even the agricultural sector is facing the phenomenon of risk amplification; GM crops and climate change are the the examples of such amplified risks. To control the amplification and attenuation risk there is a need to understand the risk perception and develop the risk perception measurement techniques and risk communication handling methods. Hence being the agricultural extension professional, we should focus our research studies on understanding and measuring of risk perception, amplification, its causes, risk attenuation and risk communication methodology.