

The organizational development and proof of functioning of KVK as a knowledge and resource centre of agricultural technology

Establishment of Mother Orchard at KVK farm along with intercropping of vegetables, spices, aromatic & fodder crops: Under the crop diversification in upland, the model format of mother orchard and intercropping farming has been established for the farmers exposure visit. Various species of fruit plants have been uplifted from



IIHR, PDKV, Dr. YSR Horticulture, CISH, NRC-Sholapur, NDAUT & IGKV. Species of Fig, Sapota, Pomegranate, Mango, Citrus, Custard Apple, Sweet lime, Sweet Orange, Aonla, Bael, Guava, and Litchi have been planted at 5mX5m. A total of 1613 fruit species have been planted in 4 hectares of land. Interstitial cultivation of spices,

seed spices and pasture crops is being done in drip and fertilization in the established mother orchard. Along with turmeric, ginger and fennel seed production, a display format of green fodder production has also been set up in Mother Orchard throughout the year. Around 1.60 lakhs of high quality fruit plants from established mother orchard have been prepared by layering, cutting, grafting etc. Fruit nursery accreditation is being done through NHB for selling quality fruit plants to government organization on indent basis. According to the weather based advice, the system of drip irrigation is being done according to the water demand of crops.

Stall feeding Model for Goat: Exhibition



format of hygienic stall feeding has been established for rearing goats of Sirohi and Black Bengal breed. A balanced concentrated feed, green and dry fodder are given in the feeding turf which is not polluted by goats fickle and urine and remains edible for a long time. Breeding program is being done to achieve pure kids. The fickle & urine of goats are collected in tanks in the morning and evening to provide high quality manures. Automatic water bowls have been installed to save water as well as to provide pure drinking water ad lib. Every year 15 to 20 kids / bucks / doe is being sold at KVK to farmers at reasonable rates.

Hydroponic Fodder Production: Hydroponic fodder is an effective solution for fodder scarcity and is very promising for sustainable livestock production. This green fodder is extremely high in protein and metabolizable energy, which is highly digestible by dairy animals. Green fodder production takes 5 to 10 days with a 0.5m³ usage of water for production of 1 tons of feed in the area of about 100m². From 1kg

seeds, it can be possible to grow 5-10kg of green fodder. In addition to this, recycling of water in hydroponic fodder production system allows solving problems related to water scarcity. At the end of the growing period, the fodder is fed to livestock as a supplement in the same way that hay and silage are currently used. It is



indicated that 600kg maize fodder per day is produced in 50 square meters area. However, for a production of the same amount of fodder 1 ha of land is required in conventional method of production. Therefore, 1kg of maize hydroponic fodder is produced in 7 days with 1.5 liter (if water is reused) or 3 liters (if water is not reused). The water which is not reused can be utilized for garden near the production unit. For production of around 600kg of hydroponic fodder, only one person suffices. About 1.50-3.0 liters of water is required to produce one kg of fresh hydroponics fodder in seven days since water can be reused. Since the hydroponics, fodder is more palatable, digestible and nutritious while imparting other health benefits to the animals and improve production performance of livestock. The cost of seed contributes about 90% of the total cost of production of hydroponics maize fodder as compared to conventional which is much lower. A group of tribal farmers have taken initiative for producing hydroponic fodder. The farmers feedback reveal that there is increase in milk yield by 0.5 to 1.0 liters per day with increase in the net

profit by 20-25 per animal per day due to feeding hydroponic fodder to dairy animals.

Hygienic housing system for improved breed (Gir & Sahiwal): Gir (5+1) and Sahiwal (5+1) breeds are being nurtured in improved housing system, in which automatic water, rubber mat, squares, feeding turf have been installed. To promote the breeds of Gir and Sahiwal, artificial insemination and natural breeding is being done. Along with saving water by automatic water



bowl, cows are given ab lib. of water per day. Squares are placed at an interval of 4 feet so that the fight for feed in the cows does not quarrel and a calculated amount of feed can be given to all. Due to the laying of rubber mat, the chances of mastitis disease and knee injury in cows are reduced. 200 to 250 kg of cow dung is collected daily from the cowshed. High quality FYM is being prepared in tanks from the collected dung. At the same time a 2 cubic meter biogas unit is also being run with cow dung. Every year 2 to 3 pure breed of



Gir & Sahiwal are being facilitated by the Center to tribal farmers at a reasonable rate. 9 to 10 tons of biogas slurry and 8 to 10 trolley FYM are produced from the

dairy unit. The diet is not contaminated with cow dung and urine due to the mouth-to-mouth system and the food remains edible for a long time. 5500 to 6000 liters of milk is being produced annually. Processing and value addition work is being done by producing ghee, khoya and cheese from the milk produced. System earned an income of Rs. 306288/- per year from pure breed, Milk, FYM & Biogas Slurry in comparison to traditional system i.e. Rs. 132248/-.

Milk Processing and Value Addition: The milk processing and value addition unit has been set up by the center in the year 2016-17. The center is collecting 100 liters of A-2 milk per day by tribal farmers through practical and preliminary tours. Ghee, khoya and paneer are being made by stored milk from formed FPO. Prepared ghee, khoya and paneer are being supplied to Chhattisgarh Cooperative Organization, Devbhog for marketing & sell. In future, 500 liters of A-2 milk will be collected from milk producer farmers and processing and value addition will be done.

Mushroom Spawn

Production: High quality spawn of Oyster, Button, Paira and Milky mushroom are being prepared from the Mushroom Spawn laboratory set up by the Center. The center has



trained a total of 650 to 700 tribal farmers by training and has inspired them to cultivate mushrooms for additional year round income. 1800 to 2000 kg of mushroom spawn has been produced by the established laboratory. Farmers are facing difficulty in selling fresh mushrooms due to lack of consumption. Hot air dryer machine is purchased by the center to diagnose this problem. So that fresh mushrooms can be dried and value addition and processing can be done for making mushroom powder. Like this farmers can get more income by selling dried mushrooms and mushroom powder.

Agrometeorology observatory: The Center has established an Agrometeorology observatory for weather based timely advice for agricultural horticulture and animal husbandry. So that weather related information can be made available immediately to farmers and other institutions in the district. In the established Observatory, the weather related equipment like maximum thermometer, minimum thermometer,

wind vane, anemometer, rain gauge, open pan evaporation, soil thermometer and sunshine recorder have been installed in the Observatory. Meteorological data from the above instruments are collected and sent to Indian Meteorological Department. Farmers of the district are being given timely seasonal advisory through Kisan Mobile Message. Information related to agricultural weather based advisory will be given at the block level under the *Gramin Krishi Mausam Seva* Project.



Egg hatching for poultry and duck birds:

The hatchery unit located in the center in which poultry birds are being produce. Fertilization of poultry and duck eggs is being done by the center from the installed hatching machine. The



The hatching machine has a capacity to fertilize 1000 eggs. The hatching machine is fertilizing the eggs of the species of Vanaraja, Grampriya, Asil & white pekin etc. Tribal farmers are being given 1 month old cottages for 50 to 60 rupees. 2500 chicks of Vanaraja, Grampriya, Asil & white pekin are being provided annually by the center. At present, breeding and conservation of the Asil breed is being done. Chicks are reared by floor method. Chicks are reared in the center till one month. Produced chickens are being given to tribal farmers on a pilot basis. Chicks of one month are sold to farmers at the rate of Rs. 75 per chicks. Currently 500-1000 Asil Chicks are being produced annually.

Year Round Fodder

Production: A year-round green fodder production program is being taken up in 0.80 ha of land in the farm during kharif, rabi and summer. Bunds of ponds located in the farm have also been used for green fodder production. The production of green fodder is being done using drip irrigation or sprinkler method. Napier (0.20 ha), perennial sorghum (0.20 ha) and maize (0.20 ha)



are being produced in the Kharif season. Oat (0.10 ha) and Berseem (0.10 ha). are being produced after the maize in Rabi. In summer, Sudan is covered after oats. Apart from this, 5-6 quintal green fodder is being obtained from Azolla tanks for livestock.

Biogas & Slurry Production: A 2 cubic meter biogas plant has been installed at the center to promote the use of renewable energy. 50 to 60 kg of cow dung is added



to the biogas plant every day. Typically, 4 to 5 cattles are needed for a 2 cubic meter biogas plant. 7 kg firewood is equivalent quantity of fuel for 2 m³ of biogas. The biogas slurry has 93% water and 7% of dry matter, of which 4.5% is organic matter and 2.5% inorganic matter. One cubic meter slurry contains 0.16 — 1.05 Kg N which is equivalent to 0.35-2.5 Kg urea. The nitrogen

content of slurry is 1.5% (1.5% N, 1.1% P and 1% K). From 730 MT dung, 76.8 MT slurry produced per year. 1.92 MT slurry is being produced every year.

Enriched Manure Production: One NADEP Tank utilizing composting of farm waste and produce 5-6 ton compost every year. Two Enriched FYM pit for collecting cow dung and producing 10-12 ton well rotten FYM used for organics at KVK Farm. Cow

dung, urine and floor waste collected through flush water in a tank and stored



enriched organic excreta applied in field. These model of organic compost appreciated by Collector (1AS) and CEO (1AS) during their visit and agreed for applicable to public domain. Goat Urine and fickle collected in a series of 5 tank and after decomposition 2.5 to 3 ton enrich compost produced per year.

Farm Mechanization: Farm mechanization is being promoted by farmers through agricultural machinery at a reasonable rate or through demonstration to complete various operations. Various farm equipment are available in the center. Various agricultural



implements like multi crop planter (02), seed drill (02), ridger (02), rotavator (02), zero till drill (02), MB plough(02) cultivators (02) etc. are provided at reasonable rates. The center is performing various agricultural processes like ridge and furrow, deep ploughing, drilling, sowing, etc. So that

time, labor and energy can be settled through farm mechanization. Various activities of farm mechanization have been displayed in more than 1000 hectares of land through FLD's, OFT's and custom hiring mode.

Fruit Nursery: High quality saplings are being set up every year from 2016-17 from the established mother orchard. Developed plant species of reputed institutes are being raising up every year from the established mother orchard under MNREGA. Every year by the center, 50000 saplings are being prepared and given to farmers under a badi development program.



Seed Production: Production of total 479.87 quintal graded seed under seed production program of rice (Indira dhan-1, Karma Masuri, Rajeshwari,

Vishnubhog, Badshah bhog, Chandrahasini, Samleshwari, Bambleshwari, 1R-64,



MTU-1010) pigeon pea (Rajeev Lochan, Asha), wheat (WH-1105, RVW-45102, GW-322), chickpea (Vaibhav), field pea (Paras), mustard (C.G.Mustard) and linseed (Kartika) in Lohari area of the KVK. Seed production is taken from the foundation and certified category. The produced seed

was supplied to Chhattisgarh State Seed and Agricultural Development Corporation.

Medicinal & Aromatic Cultivation: In the year 2017-18, the district administration has allocated 6.45 ha to promote cultivation of medicinal and aromatic crops. Farming of Lemon, Khus and Palmarosa has been started in 3 hectare land through lift irrigation and establishing drip irrigation system in 5.00 land of the farm. The remaining 2 hectares of land include van adrak, van pyaz, ama haldi, van ajwain, pacholi, stevia, van tulsi, satavar, sarpagandha, pattarchur, van lahsun, kalmegh etc. To promote the cultivation of the aromatic crops among farmers, saplings of Lemon, Khus and Palmarosa have been made available for 5 hectares of each crops. Krishna

and Kaveri of Lemon grass, motia of Palmarosa and sugandha variety of Khus have been planted. 500 kg herbs capacity essential oil extraction plant is also being set up.

Aseel poultry Production:

Aseel is an important native chicken breed of



India, known for its martial qualities (aggressive fighting abilities), pugnacity, and majestic gait. The aim is to conserve and characterize the Aseel, which is considered to be endangered. The birds were maintained on deep litter under a simulated backyard type of housing having night shelter. A total of 1250 chicks produced in the second generation from the flock collected from *KVK-Venkataramannagudem* was characterized for morphological, growth, production, and meat quality parameters. Efforts are on for improving the productivity in the flock without compromising the original breed characteristics.

Possibilities of exotic flowers in District Korea: Center conducted field trials for the Possibility of cultivation of Tulip and Lilium in the district. Various varieties of Tulip (Weespering Dream, Negrita, Agaras White) and Lilium (Litouwin White, Nashville Yellow, Brindisi Pink) were sourced along with package of practices of Tulip and Lilium from the university from Sher-e-Kashmir University of Agricultural Science & Technology of Kashmir.



Quality Production of Spices & Seed Spices:

Seed of Ginger, turmeric & fennel seed production as well as saplings of aromatic crops have been raised by the center under the project CSS-MIDH. Total production of ginger was 48.73 ton, 43.02 ton of turmeric and 35 kg of fennel respectively. Seed rhizomes of Ginger,

turmeric and fennel seed facilitated for 25 ha, 17 ha and 2.5 ha to farmers under FLD's.

Sindur Production & Processing: A total of 500 saplings have been planted in the boundary of the farm in the year 2014-15.

Plantation and processing of sindur started after intensive maintenance and management of 3 years in a mode of saplings raising and vocational training programme.

According to available data, 550 kg of seed production is



being done every year from a total of 500 plants and the production of dry sindur is getting 25 kg after processing. Technical guidance is being sought from various institutions to develop a simple method of the removal of sindur from sindur seeds.

Performance of Gladiolus Cultivars: Gladiolus is one of the important commercial crop among floriculture supplementing the regular income to small and marginal farmers. However, the major constraints of Gladiolus cultivation are low productivity due to the lack of good quality seed, non adoption of recommended package of practices and lack of awareness regarding the economics of the crop as compared to cereals. To solve this problem multi location trails were conducted during three consecutive years in the in 0.40 ha at the farming situation of district. The cultivation practices in this trial (use of improved variety i.e. Candy men, White prosperity, Dull Queen, Saffron, Summer Sunshine, Red Majesty American Beauty, Fancy Pink, Her Majesty, Novalux, Advantage, proper sowing techniques, balance dose of fertilizers, important inter-culture operations and plant protection measures.



Performance of Marigold Cultivars: Marigold is one of the important commercial crop among floriculture supplementing the regular income to small and marginal farmers. However, the major constraints of marigold cultivation are low productivity due to the lack of good quality seed, non adoption of recommended package of practices and lack of awareness regarding the economics of the crop as compared to cereals. To solve this problem multi location trails were conducted during three consecutive years in the in 0.40 ha at the farming situation of district. The cultivation practices in this trial (use of improved variety i.e. Pusa Basanti, Pusa Narangi & Pusa Arpita, proper nursery techniques, balance dose of fertilizers, important inter-culture operations and plant protection measures.



KVK in addition to the above exposure visit sites at premises, there is a well-furnished training, exhibition and administrative building with display of various technologies for knowledge enhancement of the district farmers.