

IGFRI Newsletter

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From the Directors' Desk.....

The ICAR-IGFRI Southern Regional Research Station, Dharwad



Regional Research Station, Dharwad was established in 1987 with a view to enhance the productivity and profitability of forages on sustainable basis in the peninsular India.

The Station has well equipped office building with laboratories and farm at Saidapur and Tegur. A Field laboratory was established in 2014 to facilitate and strengthen the seed production activities at Tegur farm. Scientists from diverse disciplines viz. Agronomy, Plant Breeding, Seed

Technology, Entomology, Crop Physiology and Agricultural Extension are working at the station.

Currently the major research emphasis has been on development of lucerne varieties tolerant to biotic and abiotic stresses, dual purpose cowpea varieties; augmenting fodder production on mango and sapota based horti-pastoral systems through *in-situ* soil and water conservation measures; enhancing seed production capacity in *Stylosanthes* through chemical sprays and poly-mulching; insect pest management in lucerne, cowpea and fodder sorghum and fodder maize based year-around fodder production systems, and participatory fodder production in orchards and plantation crops. The Station has to its credit the release of highly acclaimed fodder crop varieties viz. 'DHN - 6' in bajra napier hybrid, 'DGG 1' in guinea grass, 'DBRS 1' in ruzi grass; production technology for fodder maize, fodder bajra, bajra napier hybrid, perennial fodder sorghum, cowpea, mango and sapota based horti-pastoral systems; seed production package in lucerne, perennial fodder sorghum, *Stylosanthes*, guinea grass, rhodes grass, fodder cowpea, fodder maize; insect control modules in lucerne, fodder cowpea; popularization of fodder cultivation in mango orchards and socio-economic studies in fodder related agricultural systems etc. The Station is a major hub of fodder seed and planting material production and distribution to the farmers in the southern India.

Southern India has a long coastline, perennial rivers and varying agro-climatic zones. The climate endowment supports cultivation of cash crops like coffee, coconut, mango, spices, commercial flowers, aromatic plants, cotton, sugarcane, oilseeds, grapes, pomegranate, sapota, etc and helps/assists 65 per cent of the population to engage in farming activities. Fodder production in the region can be boosted by close linkages with Krishi Vigyan Kendra(KVK)s, State Agricultural Universities (SAUs), Department of Animal Husbandry, Agriculture, Horticulture, Forestry, Watershed management, several Non-Governmental Organizations (NGOs), milk federations, self-help groups and providing fodder related technologies to them. Through Fodder Technology Demonstrations (FTDs) and MeraGaonMeraGaurav (MGMG) programmes, centre is closely linked

with the farming community. Involvement in exploring newer niches for fodder crops through linkages with Taluk Panchayats, Gram Panchayats and progressive farmers, *Goushalas* in the vicinity of the Station is required with regular training programmes to the visiting farmers which can usher a new fodder revolution in the Southern region of the Country.

Horti-Pastoral Systems: Newer niches for fodder production in Southern Region of India

Fodder shortage is rampant In the Southern Region of the country owing to decline in natural grasslands, encroachment of Common Property Resources (CPRs) like Goucharas and intensive cultivation practices devoid of fodder crops. In this scenario identification of newer niches for fodder crops has become quite imperative. The wide spaced orchards of mango, sapota, guava etc. provide ample scope for introduction of fodder crops in the intervening vacant space. As farmers seldom use this space for growing any field crop, it is often occupied by unwanted weeds and other



vegetation incurring expenditure for clearing them and needing frequent inter-cultivation with no tangible monetary returns from such expenditure. Experiments were carried out at Tegur farm of IGRI SRRS, Dharwad during 2012-16 to explore the possibility of growing fodder crops as intercrops in mango and sapota orchards. Perennial fodder grasses viz. guinea grass, signal grass, grazing guinea and fodder legumes viz. *Stylosanthes hamata* and *Stylosanthes scabra* were planted as sole and in 1:1 intercropping systems in all possible combinations with sole fruit crops as control.

Under low to medium fertile shallow soils guinea grass (Var. BG2) in sole followed by ruzi grass (Var. DBRS 1) in sole recorded higher green and dry fodder yield in both sapota and mango orchards. In intercropping systems, guinea grass with either *Stylosanthes hamata* or *Stylosanthes seabrana*, under shallow degraded soils, *Brachiaria brizanta* either in sole or in intercropping with *Stylosanthes hamata* recorded the higher green and dry fodder yield respectively. There was no significant difference in the radiation interception on the top canopy of different fodder crops intercropped in the horticultural crops, however the rows adjacent to fruit crops recorded lower light interception as compared to middle rows. This clearly indicated that the fodder crops were not differentially affected by the solar radiation availability. Further the weed intensity was much lesser in fodder intercrops as compared to sole crops of sapota and mango clearly demonstrating the fact that the weed infestation was reduced with the introduction of fodder crops in mango and sapota orchards. The beneficial micro flora in soil too was positively influenced by the intercropping of fodder crops in



the mango and sapota orchards. Against the common belief that intercrops harbor pests and pathogens of main crops, there was no differential load of pests and pathogens in sole and fodder intercropped horti-pastoral systems. Lastly the intercropping of fodders in the orchards did not in any way adversely influence the vegetative and reproductive growth of mango and sapota. On the contrary horti-pastoral systems recorded the highest monetary returns as compared to sole mango and sapota crops. Thus the intercropping of fodder crops

proves more beneficial from all angles in mango and sapota orchards besides substantially alleviating the fodder shortage.

(B.G. Shivakumar & N.S. Kulkarni)

Crop Improvement

Dharwad Hybrid Napier-6 (DHN-6 / Sampoorna): A perennial irrigated high yielding Bajra-Napier hybrid suitable for intensive fodder cultivation and for commercial dairy farmers for humid and sub-humid tropics of the region. Provides high biomass, highly palatable, good quality and nutritive (high brix and low oxalic acid) perennial fodder to livestock compared to the existing Napier Bajra hybrids grown in the region. It comes to first cut in 55-60 days and subsequent cuts can be taken up at same intervals for green fodder (5-6 cuts in a year). The total green fodder yield is 200-250 t / ha / year. The hybrid has very high succulence and brix value, hence suitable for silage purpose. It is also resistant to *Helminthosporium* and rust. The clients are commercial dairy farmers, irrigated farmers, Karnataka Milk Federation etc. A large quantity of root slips/stem cuttings are sold every year during the Krishi Mela of UAS, Dharwad.

Guinea grass (*Panicum maximum*) variety Dharwad Guinea Grass-1(DGG-1): This variety has been identified for all India release in the National Group Meeting on Forage Crops in *Kharif* 2013 held at AAU, Jorhat. A perennial grass suitable for irrigated agro-ecosystem and tolerant to shade (for niches like orchards) for humid and sub-humid tropics of the region. It grows to a height of 1.0 to 1.5 m, has smooth leaf and leaf sheath surface with thick stem. It has broad and long leaves with long green panicle, flowers in about 55 to 60 days after transplanting and matures in 90 to 105 days. The average green fodder yield is 105 t/ha / year with crude protein content of 7.4 %. Highly palatable, high leaf to stem ratio (1.04), resistant to lodging and has no shattering. As a perennial crop suitable for cultivation in humid/arid, tropical and sub tropical regions, during *kharif* season. Good seed yield is obtained in sub-humid to humid tropics due to good seed filling and test weight. There is great demand for this grass by commercial dairy farmers, Karnataka Milk Federation, farmers with horticulture fruit crops like Mango, Sapota and other plantations as it can be grown in interspaces under shade.

Congo Signal Grass (*Brachiaria ruziziensis*) variety DBRS-1: This variety has been identified for release for Zone-8 in Karnataka State in 2013 for rainfed agro-ecosystem of the region. A tufted, creeping perennial with short rhizomes forming a dense leafy cover, leaves soft and hairy. It grows to a height of 130 to 140 cm with profuse tillering ability and soft stemmed with pubescence. It produces about 25 to 30 t /ha of green fodder yield and 8-10 t/ha dry fodder yield (40-45 days for each cut and 3-4 cuts) under rainfed situations. It has high crude protein content (7 to 9 per cent) with good palatability. It shows resistance to *Rhizoctonia* foliar leaf blight and spittle bug. It is highly persistent, high yielding and good quality range grass species suitable for rainfed production ecology, also suitable for soil and water conservation, on bunds, pond embankments and slopy lands, forest areas etc. Mostly benefited are dry land farmers, forest departments, watershed development boards and NGO's implementing community based development programmes.

Fodder Cowpea variety MFC-09-1: It has been identified for adoption for Zone-8 of Karnataka state during 2016. An annual nutritious fodder legume suitable to be grown throughout the year under both rainfed and irrigated conditions. A semi-determinant type with erect, broad and dark green leaves. Pods are light green in colour. It comes to 50 % flowering in 55-60 days and matures in 85 days. It produces 24-25 t/ha green fodder and 4.0 t/ha dry matter. Since it has average seed yield of 6.5 q/ha, it can be used as a dual purpose type. It is highly palatable with high crude protein per cent (18%). It is resistant to Yellow Mosaic Virus and moderately resistant aphids. It has wide adaptability and can be grown throughout the year.

(K. Sridhar)

Forage Seed Production and Multiplication through Farmers' Participatory Approach in Karnataka

One of the bottlenecks to increase livestock production in Karnataka is the shortage of feed for different animal species. In order to improve the shortage of livestock feed in crop livestock production system, it is important for farmers to integrate forage production in the farming system. Establishing reliable forage production depends on the availability of reliable supplies of quality forage seeds/cuttings and locally produced forage seed ensures sustainability and it is economical. At local and national scale, despite the presence of high demand, there is a critical shortage of forage seeds. One option could be the involvement of the community in the production of forage seeds and by linking community based seed production with a reliable market to sustain the production of different forage seeds. To this effect, production of forage seeds on a contractual agreement base had been tried and was found to be successful.

In the first year, to understand and realize farmers' interest in forage production and development in particular to forage seed production, a workshop and training was organized in the first year (2014) at the beginning of the study and the objectives were to technically equip the farmers how they can produce forage seeds primarily to use for themselves in subsequent growing season, for their animal feed and sell the rest as other cereal crops to generate additional income and to bring the buyers and producer at front. The training was provided on most promising productive species and to the interest of the buyer. In the year 2014, five farmers from Gorantla Mandal of Anantpur district (Andhra Pradesh), two farmers from Gadag district of Karnataka and one farmer each from Dharwad and Raichur district were selected. The purchase price of the produce was fixed at 20 % lesser than the sale price of the institute.

A total of around 20 q Perennial fodder sorghum, 8.0 q *Stylosanthes hamata*, 8.0 q Lucerne, 27.0 q Maize, 2.50 q Cowpea seed was produced till date. In the current year, more number of farmers have shown the interest and are inclined to produce the fodder seed keeping in view of their local conditions and land holding. This mode of seed production has made tremendous impact on the availability of quality seed among the farmers and also helped the farmers in realizing the higher profit over the most important economic crop of the region.



(Vinod Kumar & B. G. Shivakumar)

Seed production technology in Lucerne

Lucerne being an important legume forage crop of the region, its seed production has immense potential to improve the economic status of the farmers. Lucerne has the potential to provide substantial dry matter yields of quality feed that is very high in protein, mainly as conserved forage. The demand for quality seed of lucerne is increasing day by day due to more number of farmers' are involving themselves in livestock rearing in the region. Since, lucerne can be fed to all types of

animals and green as well as dry fodder; many farmers are cultivating this crop. Among the three ruling perennial varieties in the country, Anand – 3, has been identified as the best suited variety for seed production over Co-1 and RL-88 enhancing additional higher income of about Rs. 10,000/ha to farmers. For higher seed set and seed yield in lucerne, application of micronutrients KNO₃ @ 4 kg/ha and Boron @ 100 ppm twice at flowering stage is recommended for commercial seed production. Cultivar Anand-3 recorded the highest seed yield (267.27 q/ha) over RL-88 (251.12 q/ha) and CO-1 (253.48 q/ha). Keeping in view of the current demand, need to enhance the availability of quality seed among the farmers and encourage the farmers to go for seed production by demonstrating the comparative performance in-terms of higher monetary benefit of lucerne seed production over the existing best crop of the region.



(Vinod Kumar)

Green Fodder Production Potential in Fruits and Plantation Crops

Introduction of forage crops in interrow spaces of fruit and plantation (F&P) crops is practical only when the space between tree rows is 6 m. This is arrived by considering two factors –one is that 3 m is required for basins of trees and second is 3 m is required for intercultural operations using tractor (width of the tractor along with implements attached to it is 3 m). Totally 36 F&P crops cultivated in southern India were analysed for inter row spaces and was found that 23 F&P crops had spacing of 6 m and above. Recent (2014-15) secondary data on district wise area under these 23 F&P crops were collected for Karnataka, Andhra Pradesh, Tamil Nadu and Kerala. Percent contribution of each F&P crop to the total area under these crops in the state, when worked out found that 8 F&P crops in Tamil Nadu, 7 each in Karnataka and Andhra Pradesh and 6 in Kerala contributed for more than 70 per cent area under these crops (Table 1) which were hence considered further to estimate fodder production.

Table1 Fruit and plantation crops covering substantial area in southern states

States	Crops
Andhra Pradesh (7)	Sapota, Mango, Orange, Guava, Coconut, Oilpalm, cashew
Karnataka (7)	Mango, Citrus, Guava, Sapota, Jackfruit, Ber, Coconut
Kerala (6)	Tamarind, Coconut, Cocoa, Jackfruit, Mango, Cashew
Tamil Nadu (8)	Mango, Jackfruit, Guava, Orange, Cashewnut, Coconut, Tamarind, Sapota

Using district wise data on area under these selected F&P crops, inter-row space available for fodder production was worked out district wise and crop wise. All states together when considered, maximum area available was for coconut followed by Mango, Cashew, Jack, Orange, Guava, Sapota, Tamarind, Oilpalm, Cocoa and Ber. District wise analysis indicated that 4 (Chittur, Krishna, Vizianagaram and Khammam) out of 22 districts of undivided Andhra Pradesh; 3 (Tumkur, Hassan and Chikmagalur) out of 30 districts of Karnataka; 5

(Coimbatore, Krishnagiri, Dindigul, Tiruvannamalai and Vellore) out of 31 districts of Tamil Nadu ; and 5 (Palakkad, Kannur, Idukki, Malappuram and Kozhikode) out of 14 districts of Kerala together contributed more than 50% of area under F&P crops. These districts contributed 54.13 % in Andhra Pradesh, 54.28 % in Karnataka, 53.33 % in Tamil Nadu and 57% in Kerala to the total area under F&P crops providing immense opportunity to introduce fodder innovations in F&P crops. Estimated green fodder production potential in F&P crops was highest in Andhra Pradesh (33.30 million tons) followed by Karnataka (14.43 million tons), Tamil Nadu (12.03 million tons) and Kerala (7.37 million tons). These states can together produce 67.13 million tons of green fodder sufficing the yearly green fodder requirement of 13.57 million Adult Cattle Units.

(Nagaratna Biradar, B.G.Shivakumar, Narendra Kulkarni and Vinod Kumar)

Mera Gaon Mera Gaurav (MGMG) Activities

This is an important activity of the IGRI Southern Regional Research Station, Dharwad. Under this



programme two teams of Scientists started their activity since October 2015. Each team has identified 5 villages in the Dharwad district to showcase the fodder technologies and act as link between farmers and other organization involved in the dissemination of needy information to the farming community. Regular meetings with the farmers of the villages, discussing the agricultural problems of the

farmers, identifying suitable solutions, creating awareness about recent trends in agriculture viz. organic farming, animal husbandry, cleanliness activities etc. haven been major activities. Involvement of school children in the activities has been an integral part of this programme so that younger people are exposed to the newer things particularly with regard to cleanliness issues. Besides providing the quality inputs for encouraging the farmers for fodder production, conducting animal health camps, lectures by experts on current issues of significance etc. are the thrust areas.



Fodder seed and planting material of latest varieties of Napier Bajra hybrid var. DHN 6, Guinea grass var. DGG 1, perennial fodder Sorghum var. CoFS 29, fodder Maize var. African Tall, Cowpea var. BL 1, Lucerne var. RL 88 etc have been distributed to about 50 farmers in 10 villages under this programme. Besides growing as



sole crops, technologies have be provided for growing under horti-pastoral systems with emphasis on integrated farming system with animal stock as a major component. Periodical visits are made and guidance was given to farmers to overcome the location



specific problems. Expert -farmers interface was facilitated for specific issues raised by the farmers from Agricultural University, line departments, NGOs etc. Two livestock health camps at Kurubagatti

and Mansur villages; two group discussions on swachhata abhiyan at Mulmuttal and Mangundi villages and an expert lecture on organic farming were held during last one year. A great deal of interest was shown in all these programmes by the farmers and school children, teachers, village panchayat members etc. It is aimed to make these selected villages model ones for technology adoption for the benefit of the neighbouring villages in Dharwad district.

(B.G. Shivakumr, N.B. Biradar, K. Sridhar, Vinod Kumar, N.S. Kulkarni, Edna Antony)

Swachhtha Abhiyan Activities

IGFRI is continuing Swachha Bharat Mission in all its divisions and sections with utmost sincerity. The cleanliness drive was taken in laboratories, offices, canteen, research farm (experimental plots, animal farm, seed depot, farm machinery and implement shed) hostel, residential campus etc. A series of cleanliness activities including cleaning and sweeping of offices, corridors and premises and disposing of junk material were continued regularly. White washing of the institute main building, administrative block-II was completed as a part of this mission. Farm and animal wastes were enriched through composting for better nutrient availability to crops as well as through bio-gas for green energy generation. The same was also replicated in many villages as part of Swachha Bharat mission. Institute's scientists also spread this concept of Swachha Bharat mission in all the 80 MGMG villages through farm and livestock waste management as compost. Institute had also taken cleanliness drive in schools and colleges, where students were taught the importance of cleanliness and personnel hygiene to prevent contagious diseases. Students were advised to use toilets and avoid open defecation and also to convince their parents to construct toilets in house premises. The mission was also implemented wholeheartedly in all the regional stations (Dharwad, Avikanagar and Srinagar) including Palampur center by organizing awareness camps at educational institutions and villages.



Staff members of SRRS, Dharwad taking *Swachchatha Abhiyan* oath



Cleaning Outside the IGFRI institute gate



Cleaning awareness at Mansur, a MGMG adapted village



Discussion with the mayor of Hubballi-Dharwad on Swachchatha Abhiyan

Staff of SRRS, Dharwad also involved in special cleaning activities during Independence Day, Republic Day celebrations and also created awareness to the school children of MGMG adapted villages. Regularly reported were prepared and sent to the head quarter.

Retirements

 Govind Das, SSS 31.01.2017	 Munn Lal, SSS 31.01.2017	 Ram Sewak Saman Wetan Shramik 31.01.2017	 Atar Singh Saman Wetan Shramik 31.01.2017
 Dev Singh Saman Wetan Shramik 31.01.2017	 Bhagwan Das SSS 28.02.2017	 Lakhon Singh Saman Wetan Shramik 28.02.2017	 Puran Saman Wetan Shramik 31.03.2017
 Ram Singh, T-1 31.05.2017	 Bhudh Singh SSS 31.05.2017	 Budha Saman Wetan Shramik 31.05.2017	

Joining:-

1. Dr. S N Rokde (Principal Scientist) – 27.04.2017
2. Mrs. Rekha Balodi (Scientist) – 13.04.2017
3. Mr. Vikas Chandra Tyagi (Scientist) – 01.04.2017

List of Promotions:-

Name	Present Post	Promoted to	Office order Date
Shri D.K. Shingra	T-4	T-5	28.02.2017
Shri Pawan Kumar	T-3	T-4	28.02.2017
Shri Raj Kapoor Singh	T-4	T-5	31.01.2017
Shri Chote Khan	T-3	T-4	01.05.2017
Amt. Anita Srivastava	T-3	T-4	06.04.2017
Shri Avinash Chandra	T-7/8	T-9	18.05.2017
Shri Anil Kumar	T-7/8	T-9	18.05.2017
Shri Rajendra Kumar	Assistant	MACP Upgradation	10.03.2017

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