भाकृअनुप
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IGFRI Newsletter

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From Director's Desk.....

In the world of changing socio-economic and environmental scenario, the diverse constraints for forage security and sustainable livestock production are fetching the attention of policy makers at National level. The emerging scenario compelled Indian Grassland and Fodder Research Institute (IGFRI), Jhansi to have a potential strategy through which generated technologies can be transmitted to the ultimate consumers.

In this endeavour, IGFRI has taken innovative farmers friendly effort to enhance forage production and productivity. One of them, I would like to share with you is **ATIC** (*Agricultural Technology Information centre*) which started at IGFRI in Jan. 2013. The rationale for establishment of ATIC, in general, is to provide inputs, published literature and consultancy to farmers under one umbrella. Its objective is **Single Window Approach** for the farmers. At present, activities of ATIC at IGFRI are sale and distribution of literature, sale of institute's products such as seed, rooted-slips or any other planting material, sale of value added fodder products, conducting visits of farmers/clients, exhibition of technologies in ATIC compound, diagnostic services with the help of CAL (Central analytical laboratory), and also advisory services. There is a scientific advisory committee comprised of subject matter specialists, the farmers are free to interact with the committee and resolve their problem.. **Kissan Call Centre** is also established at ATIC which satisfies the quarries of farmers by a multidisciplinary team of scientist. Farmers can take full advantage of it by using KCC no *i.e., 0510*-2730241.

Various efforts had been made by IGFRI and other agencies for adoption of fodder technologies among resource-poor smallholder farmers. Still, there is a critical technological gap regarding acceptance and potential adoptability of fodder technology especially by small farmers. This technological gap of fodder production constrains needs to be addressed with concerted efforts having a sound strategy by a multidisciplinary team of scientist for scaling up of fodder production at farmers field. Under this programme ***Adarsh Chara Gram*** will be established in Budelkhand region to motivate the surrounding villagers for adoption of scientific fodder production and utilization technologies. ***e- chara centre*** will be very soon visible in this region. All technologies developed at IGFRI will also be tested at farmers' field under this outreach programme.

Inter-institutional linkage and collaboration is also on the top priority of this institute. National Initiative on Fodder Technology Demonstration (**NIFTD)** has been started by IGFRI, using KVK as a hub for up-scaling and adoption of forage technology. Other inter-institutional outreach programs of institute like are also in pipeline and we are waiting for the nod of funding agencies to gear up fodder production in unexploited areas.

For taking care of unprivileged section of farming community, the institute is running a livelihood improvement programme for tribal farmers and farm women belonging to Dhar and Jhabua district (Madhya Pradesh), Banswara district (Rajasthan), and Nandurbar district (Maharastra) under **TSP** (*Tribal sub plan*) since 2012-13.. Besides, other outreach programmes like NICRA and NAIP are being implemented by the institute in Bundelkhand and MP regions.

Expert System on Fodder and Grasses has been developed by our scientists to enable farmers to reach the technologies by just a mouse click. It is available on the institute website (www.igfri.res.in).

I congratulate my team of scientists and technical staff for their endeavor to transfer the technologies to farmer's fields, but we cannot sit in peace until and unless we knock every door of the farmers to bridge the gap in fodder supply and demand in the country.

Seed priming- a novel approach for micronutrient bio-fortification in forage crops

Problem of micronutrient deficiency especially Zn in soil and plants is widespread across the globe. In India about 50% soils are classified as Zn deficient. Zinc deficiency is also prevalent in the Bundelkhand region. Most of the soils of Banda (66%) and Jhansi (60%), Hamirpur (49%) and Jalaun (48%) districts have zinc deficiency. Cu and Mn deficiency has also been reported in the region. In several studies at Indian Grassland and Fodder Research Institute, Jhansi it has been observed that lactating and mature cows were unable to meet requirement of Ca, P, Cu and Zn from the feed and forages. Specially, availability of Cu and Zn has been reported below the required level in the entire feeding situation. The adoption of integrated nutrient management (INM) in Sorghum and Oat was effective in improving the productivity and forage quality with respect to the nutrient densification. In an investigation for development of best management practices (BMP) for micronutrient bio-fortification it was observed that seed priming with 0.05% solution of ZnSO4 + CuSO4 + MnSO4 for 12 hrs + VAM + 50% RDM (Zn:Cu:Mn :: 10:2.5:5 kg/ha) produced significantly higher green forage yield of the Oat and Sorghum in comparison to without micronutrient application (Table 1). The micronutrient enrichment was also observed in the hay obtained from the best management practices (Table 2).

Table 2. Nutrient status of forage (ppm)

Nutrients	Oat		Sorghum	
	General	BMP	General	BMP
Zn	28.56	34.22	33.98	36.96
Cu	8.6	11.62	4.3	6.76
Mn	74.55	92.48	51.56	57.59

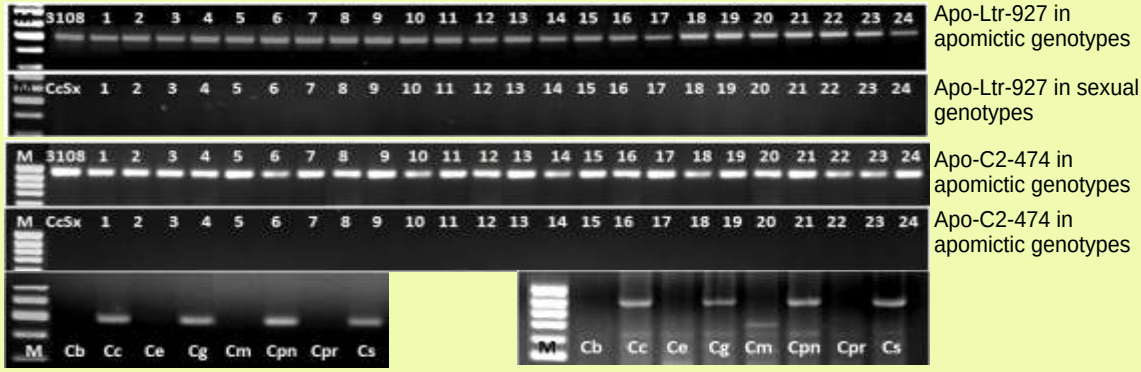
Table 1. Effect of micronutrient application on green and dry forage yield (q/ha)

	Oat		Sorghum+ cowpea	
Treatments	GFY	DFY	GFY	DFY
Without micronutrient application (T1)-General	486.7	131.4	204.1	63.2
50% RDM +VAM+ Seed priming in 0.05 % ZnSO4 solution for 12 hrs (T2)-BMP	517.5	150.1	252.2	77
Probability	0.04	0.03	0.03	0.04

SCAR markers linked to apomixis in Cenchrus ciliaris L.

Amplicons unique were identified to the apomictic progenies of C. ciliaris, which were cloned and sequenced. Forward and reverse primers were designed based on the sequence information thus obtained. Towards validation of the SCAR (sequence characterized amplified region) markers, the primer pairs were used for PCR amplification of genomic DNA from 24 individuals each from obligate apomictic and obligate sexual progenies from the F_2 mapping population along with an apomictic (3108) and an obligate sexual (CcSx-08/1) plant as positive control. The SCAR markers Apo-C2-474 and Apo-Ltr-927 showed band of the expected size in all the apomictic genotypes, while no band was seen in any of the sexual genotype (Fig. 1a,b). Interestingly, both the SCAR markers showed linkage with the apomixis trait in Cenchrus. When the SCAR markers were validated in 8 different species of the genus Cenchrus, they showed amplification product of the expected sizes in C. ciliaris, C. glaucus, C. pennisetiformis and C. setigerus, but no band was seen in C. biflorus, C. echinatus, C. mysuroides and C. prieurii (Fig. 1c,d). These markers will be very useful in screening of segregating populations for the mode of reproduction. If combined with the earlier identified sexuality-specific SCAR marker (viz. CcSex-250), these can help in identify the obligate apomictic plants in the mapping population.

Apomixis-specific SCAR markers in *Cenchrus* species. (**a**) SCAR Apo-C2-474 gives amplicon of 474 bp in apomictic genotypes, but no amplification in sexual genotypes. (**b**) SCAR Apo-Ltr-927 gives amplicon of 927 bp in apomictic genotypes, but no amplification in sexual genotypes. (**c**) Apo-C2-474, and (**d**) Apo-Ltr-927 give amplification in apomictic *Cenchrus* species only.



Apo-Ltr-927 in apomictic genotypes

Apo-Ltr-927 in sexual genotypes

Apo-C2-474 in apomictic genotypes

Apo-C2-474 in apomictic genotypes

Exposed stigma and male sterile plants identified in F_1's and half-sib progeny of Lucerne

Crosses attempted between Indian lucerne varieties and exotic germplasm accessions, for generation of variability, yielded 263 F_1 plants in eight cross combinations. The F_1 hybrid seedlings were space planted (50 cm x 50 cm) in the field along with Anand-2 parent as check. Morphological observations showed F_1 plants with varied plant morphology and days to flowering. It was observed in two F_1 plants of RL-88 *(Medicago sativa)* x CRAU *(Medicago varia)* , one plant of RL-88 (Medicago sativa) x Weevil check and one plant of CRAU (half-sib progeny seeds) yielded exposed stigma and branched racemes. Upon observation it was found that the pollen grains were sterile under acetocarmine staining during dry month (April). However, the same plants exhibited 80-85% fertility during the month of May after receipt of rains. Such character expression might be due to variation in temperature. Open capsule (sickle shaped) set was noticed in these plants and upon selfing also, all the plants showed capsule set. The expression of thermo-sensitive male sterility observed in these plants might help their use in hybrid seed production in Lucerne in India.




Stem borer a severe problem in sapota

The Mango stem borer (*Batocera rufomaculata*) has got a wide range of host plants and it can infest more than 30 types of plants. This pest was found affecting Sapota (*Manilkara zapota*) plants severely at Tegur farm of IGFRI, SRRS, Dharwad during July-August, 2012.

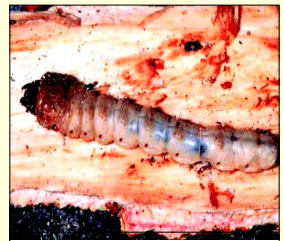
It is widely distributed in India attacking a variety of fruit trees. Adults are stout, dark brown long corn beetles (50-55 mm) with yellowish-green pubescence. Prothorax has two large kidney shaped orange spots and short thick spine like projections, one on each side. Adults emerge on the onset of monsoons. The female beetle lays 12-15 eggs on the bark of the trunk or of the primary/secondary branches. Eggs hatch in 7-13 days. Larval period extends for 77-102 days. The grubs are fleshy, yellowish and bear powerful mandibles, which make zig-zag burrows in the branches. Mature larva pupates in a calcareous chamber inside the tunnel. Pupal period lasts for 19-36 days. The grub of this pest feeds inside of the stem, making tunnel upward which results in drying of branches and in severe cases death of the tree. Affected stems show holes from which faecal pellets and chewed wood particles come out, and seen heaped below. Infested stems or branches wilt and ultimately dry. The fruit bearing is adversely affected. If main trunk is infested, the tree may die. This insect completes only one generation in a year. Removing and destroying all affected branches in early stages of attack is the best remedy. Adults can be collected and killed by installing light trap. If main stem or trunk is attacked insert cotton wool soaked in petrol, kerosene or dichlorvos and seal the holes with mud, to suffocate and kill the grub inside.


Dead plant of Sapota being uprooted


Stem of affected Sapota plant


Sapota fruit from affect plant


An adult insect


Grub affecting the plant

Response of alfalfa weevil, *Hypera postica* Gyllen. on an exotic weevil check cultivar

This fodder crop is prone to the attack of weevil**,** *Hypera* ***postica*** Gyllenhal (Coleoptera: Curculionidae). The resistance of lucerne check received from New Zealand was further confirmed *H. postica* under Indian hot spot conditions at Jhansi. The material was planted in an insect screening nursery of one square meter having double rows of susceptible variety Anand-2. The Lucerne check was planted in the centre of the plot so that it could receive maximum pest pressure. The experiment was replicated four times. Simultaneously another set of experiment having eleven replications was also carried out in the laboratory under no choice/forced feeding conditions. The screening under natural infestation conditions resulted negligible incidence of weevil on test cultivar while laboratory screening showed a maximum of 5.08 per cent leaf damage incidence in resistant cultivar while in susceptible check a maximum of 46.0 per cent weevil damage was recorded. This shows the comparative resistance/tolerance of exotic weevil check cultivar to weevil attack.

Evaluation of range legumes for nutritious and quality forage

290 accessions of 72 species belonging to 25 genera of three subfamilies of herbaceous pasture / range legumes have been collected / procured and conserved in field gene bank. These indigenous (52) and exotic germplasm lines (241) mainly from ILRI, Ethiopia are being evaluated for germination, adaptability, morphological and agro-economic traits under semi-arid conditions. The objective is to identify promising lines with better forage quality in terms of protein-carbohydrate ratio, vitamins and minerals.

Besides fodder value, some of these species are also reported to be utilized for food, medicines, cover crops, soil improver, ornamentals and for several other purposes, which are added advantages of the collected germplasms. Few exotic accessions of Aeschynomene falcate, Macrotyloma africanum, Neonotonia whitii, Stylosanthes leiocarpa and Zornea glochidiata showed poor germination but were well adapted, whereas, Dolichos sericeus, Rhyncosia densiflora and R. elegans did not germinate. Macroptilium lathyroides, M. atropurpureum, Aeschynomene americana, Rhyncosia malacophylla, R. minima, Macrotyloma axillare, Macrotyloma uniflorum, Canavalia gladiata, C. ensiformis and three Centrosema species namely pubescence, macrocarpum and virginianum were found promising and palatable. (Fig.)

Ryncosia minima

Maccrotyloma lathyroies

Centrosema virginianum

Macrotyloma unifflorum

Fig.Conservation and evaluation of pasture / range legumes of semi arid regions for quality forage.

Four promising range legumes namely *Cajanus scarabaeoides, Clitoria ternatea, Macroptilium atropurpureum* and *Macrotyloma uniflorum* have been selected out of 18 indigenous range legumes and grown with three elite grasses viz, *Cenchrus ciliaris, Chrysopogon fulvus* and *Panicum maximum* in strip sowing. *Stylosanthes seabrana* was used as a control species to assess the compatability and persistence of the selected legumes with grasses. In the first year of establishment phase *Macrotyloma uniflorum* gave maximum response to green forage yield per plant (GFY/plant (274.47g)) followed by *Macroptilium atropurpureum* (87.2 g), *Cajanus scarabaeoides* (68.7 g), *Clitoria ternatea* (57.5 g) and *Stylosanthes seabrana* (54.8 g). However, grasses showed poor germination and growth in the establishment phase with maximum GFY/plant in *Panicum maximum* (Fig.) all the legumes showed good GFY and DMY as compared to grasses (Fig.).

Fig. Establishment phase of promising indigenous range legumes based grassland.

संस्थान की प्रचार एवं प्रसार गतिविधियॉ द्धजनवरी से मार्च 2013ऋ

कृषि मेला/प्रदर्शनी :

,xhdYpj dkxl d vUrxr vkMhlk d'f'k ,o ik|kfxdh fo"ofo|ky;] Hkou"oj e 7-9 Qjojh] 2013 dk d'f'k eyk ,o in"kuh dk vk;ktu fd;k x;kA ftle lLFkku d fun"kd Mk- ih-d- ?kk'k d urRo e Mk- lR;fi; ,o Jh t-ih- mik/;k; u fofHkUu pkjk mRiknu rdfudk;k] ie[k pkjk itkfr;k ,o lk"kiyu icU/ku] Qly vo"'kk ,o pkjk Qlyk dk l?kuhdj.k rFkk Hk.Mkj.k o lk"k vkgkj d fy, YkhQehy dk mRiknu ,o mi;kx l lEcfU/kr rdfudh dh inf"kr fd;k x;kA eyk@in"kuh dk vn?kkVu vkMhlk in"k d ekuuh; d'f'k e=h Jh Mh-ih- feJk }kjk fd;k x;kA bl volj ij d'f'k e=h u pkjk lLFkku] >klh d in"kuh LVvky dk voykdu fd;k rFkk tkudkjh ikIr dhA rhu fnolh; eyk@in"kuh e vyx&vyx le; ij n"k d fo[;kr d'f'k oKkfud o f"k{kkfon] Hkkoh o fdlkuk u voykdu fd;k ,o viu&viu i"uk dk lek/kku ik;kAdk;de d vr e lLFkku dk ,d mRd'V in"kuh d fy, Le'fr fpUg HkV fd;k x;kA

vkMhlk in'k d ekuuh; df"k e=h Jh Mh-ih-feJk u pkjk lLFkku] >klh d in'kuh LVvky ij

पूसा नई दिल्ली में राष्ट्रीय किसान मेलारू

2013 Hkkjrh; d'k vul/kku lLFkku ¼iwlk½ d rRoko/kku e 6&9 ekp] 2013 dk jk'Vh; fdlku ey dk vk;ktu fd;k x;kA ft ldk mn?kkVu dUnh; d'k e=h ekuuh; Jh "kjn iokj th d dj deyk }kjk lEiUu gvkA bl dk;de e Hkkjrh; vul/kku ,o pkjk vul/kku lLFkku] >kSh l Mk- lR;fi; ofj'B oKkfud ¼d'k ilkj½ ,o Jh t-ih- mik/;k; ofj'B rduhdh vf/kdkjh u in"kuh yxk;hA bl volj ij fofHkUu in"kk tEe d"ehj] fgekpj in"k] gfj;kuk] itkc] jktLFkku] m-i-] e-i-] NRrhlx<] egkjk'V] xtjkr] vkUnin"k] vklke] ukxky.M] if"pe cxky o fcgkj d yk[kk fdlkuk u gekj lLFkku dh rdfufd;kk o pkjk itkfr; vkfn d fo'k; e tkudkjh ikIr dh rFkk lcf/kr lkfgR; ikIr fd;A bl volj ij vkdk"kok.kh] ub fnYyh o njn"ku u Hkh gekj lLFkku d pkjk mRiknu rdfufd;k dh fofM;k fjdkfMx o lk{kRdkj fy;kA

अन्तराष्ट्रीय महिला दिवस पर महिला कृषि दिवस का आयोजन

08 ekp 2013 dk xke Mkekxkj ftyk&>kSh e efgyk d'k fnol dk vk;ktu fd;k x;kA ble vkl&ikl d xkok dh cMh l[;k e efgykvk u Hkkx fy;kA dk;de dk mn?kkVu lLFkku d fun"kd Mk- ih-d- ?kk'k u fd;kA mUgku viu mnok/ku e d'k@i"kikyu e efgykvk d ;kxnku dh ppk dhA bl volj ij lLFkku d oKkfud Mk- luhy frokjh] Mk- Mh-vkj- ekyoh;] Mk- egkjkt flg vkfn u Hkkx fy;kA dk;de dk lpkyu efgyk oKkfud Mk- lk/kuk ik.M; u fd;kA

केन्द्रीय भेड़ व उन शोध संस्थान, अविकानगर में कृषि मेला/प्रदर्शनी

lLFkku d {k=h; vul/kku dUn vfodkuxj] jktLFkku o lkekftd foKku foHkkx d l;Dr i;kl l 23 ekp] 2013 dk dUnh; HkkM o mu "kk/k lLFkku]vfodkuxj e vk;kftr lk"k eyk e lLFkku dh xfrfof/k;k l lcf/kr in"kuh yxk;h x;hA ftldk voykdu Hkkjrh; df'k vul/kku ifj'kn d egkfun"kd ekuuh; Mk- v;liu th u fd;kA bl volj ij lLFkku d fun"kd Mk- ih-d-?kk'k] Mk- ,l-,y-ehuk o Mk- ih- "kek vkfn ekt n jgA

जलवायु आधारित तीन दिवसीय किसान मेंला / किसान गोक्ठी में सहभागिता

Rkhu fnolh; tyok; vk/kkfjr fdlku eyk@d'k in"kuh 18-&19 ekp] 2013 rd ljdkjh d'k fo|ky;] fpjxko e d'k foHkkx mRrj in"k }kjk vk;kftr fd;k x;kA ey e vk;kftr fdlku xk'Bh e >kSh ,o fp«kdV eMy d fofHkUu xkok l vk; yxHkx 2000 fdlkuk dk Mk- vkj d "kek ofj'B rduhdh vf/kdkjh u 0;k[;ku d ekË;e l pkjk mRiknu rduhfd;k igy ij Kku oèku fd;k x;kA

कञ्झक्क गोक्ठी का आयोजन

f"koijh fty d xjjk xke e Mk-ih-d-?kk'k] fun"kd Hkk-p-,o pk-vu-l-]>kSh d ur'Ro e lkekftd foKku foHkkx ,o lLFkku d vU; oKkfudk u d''kd xk'Bh dk vk;ktu fd;k A xk'Bh e oKkfud&d''kdk d chp e pkjk Qlyk ,o lk"kikyu ij ifjppk gbA fun"kd u fdlkuk dh leL;kvk l tudkjh ikIr dh ,o mud lek/kku gr mfpr l>ko fn;kA d''kd xk'Bh d ckn fun"kd ,o oKkfudk u pkjk rduhdh in"ku dk fdlkuk d lkFk voykdu fd;kA

PMC Visit



Visits of IFS Officers

RAC Meeting



Visit of IAS Officers


विक्रय हेतु उत्तम श्रेणी बीज

चारा फसलें	प्रजनक दर (रू. प्रति कि.)	टी.एफ.एल. दर (रू. प्रति कि.)
cj lhe %	260	140
tb %	42	25
Xokj %	350	300
ykfc;k %	75	60
pjh %	80	50
?kkl %		
fxUuh	400	400
nhukukFk	250	250
/kkeu ?kkl	400	250
vtu	400	300
LVkbyk	300	250
/kcy ?kkl	400	260
Lkccy	250	200

?kkl dh TkM %
¼ufi;j@fxUuh½ : -0-75@fLyi
¼vtu@/kcy@/kkeu@yEik½ : -0-50@fLyi

Retirements

Shir Ram Behari
January 2013

Shir Pooran Singh
Febuary 2013

Shri Channu Lal
March 2013

Shri Amar Singh
March 2013