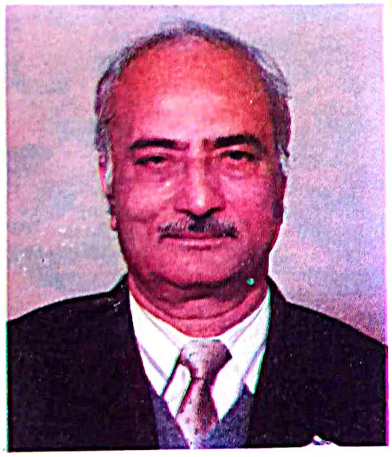
Agroforestry
NEWSLETTER

VOL.7(4) OCT. - DEC. 1995 QUARTERLY



CONGRATULATIONS

Dr. Gajendra Bahadur Singh a renowned agricultural scientist has assumed the charge of Deputy Director General (Soil, agronomy and agroforestry), Indian Council of Agricultural Research, Krishi Bhavan, New Delhi w.e.f. 4.12.1995. Prior to joining this elevated position he served in various capacities in India and abroad. Some notable positions are Director, Indian Institute of Sugarcane Research, Lucknow (1991-95). Assistant Director General (Agronomy), ICAR (1982-85), visiting Scientist and Coordinator for the East Africa Progamme of International Centre for Research in Agroforestry (ICARF), Nairobi , Kenya (1987-91), DDG (Soils, Agron. & Engg.), ICAR (1987-89) and Director, ICAR Research Complex for NEH Region, Meghalaya (1981-82).

He has made significant contribution in the area of Research Management and Transfer of Technology. He developed agroforestry systems for East Africa. Dr. Singh was instrumental in developing sugarcane zones in India based on the agro-ecology and crop performance.

Dr. Singh is a well known agronomist and has to his credit more than 150 research papers articles and 9 books.

Dr. Singh received the prestigeous Fakhruddin Ali Ahmad award for outstanding agricultural research in tribal areas (1980-81) and ICAR Award for leading the best research team (1981- 82).

We are confident that Agroforestry research in the country and National Research Centre for Agroforestry, the only nodal agency will develop to its optimal potential under the dynamic leadership and able guidance of the new Deputy Director General (SA & AF), ICAR, Krishi Bhawan, New Delhi.

Director and Staff of NRCAF, Jhansi wish him all success in his present endeavour.

Compiled & Edited by Dr. A.S.Gill & Dr.A.K. Bisaria

National Research Centre For Agroforestry, Jhansi.
NRCAF

A SUCCESS STORY

This is a success story of an advanced farmer whose each acre of agricultural land is producing timber, food, fruits and fuel. The income generated through agroforestry systems now exceeds the income from commonly grown crops in a year in Punjab, Haryana and Western U.P., the famous green belt area of the country.

Hara farm owned by Sardar Surinder Singh Hara in Amadalpur Village (Jagadhari) of Haryana State is a model where different agroforestry systems speaks themself. Experience here shows that tree farming with crops responds to irrigation and fertilizer. Earlier when teak wood was selling at Rs. 300/- per ton it did not make any sense to irrigate and fertilise, but now when teak wood price is Rs. 30,000/- per tone it is worth to use irrigation and fertiliser judiciously. Same case is with poplar.

The farmer initiated the programme in 1983. The results of poplar grown in 5.5 year rotation to 11.5 year poplar rotation are shown in Fig.1. The 11.5 year poplar rotation gave an income of Rs. 85,000/- per hectare per year from poplar alone. Income from intercrops and the mango tree was extra.

Mango :- poplar + turmeric agroforestry model.

The farmer is producing 12-16 tonnes of poplars per acre per year (90% as marketable wood and remaining sold as fuel) plus 1.5 tonnes of wheat per acre per year or its equivalent to oilseeds crops, flowers, forages, etc., while fruit plants yield separately.

Hara farm is trying to grow 80-100 plants of Litchi and mangoes per acre in association with 100 poplars. Peers trees with proper pruning @ 100 trees/acre are grown alongwith 100 poplars trees plus turmeric crop in the interspaces. All these three (Peers-poplar-turmeric) give more income than the traditional crops grown in northern India.

Dr. A.S.Gill
NRCAF JHANSI

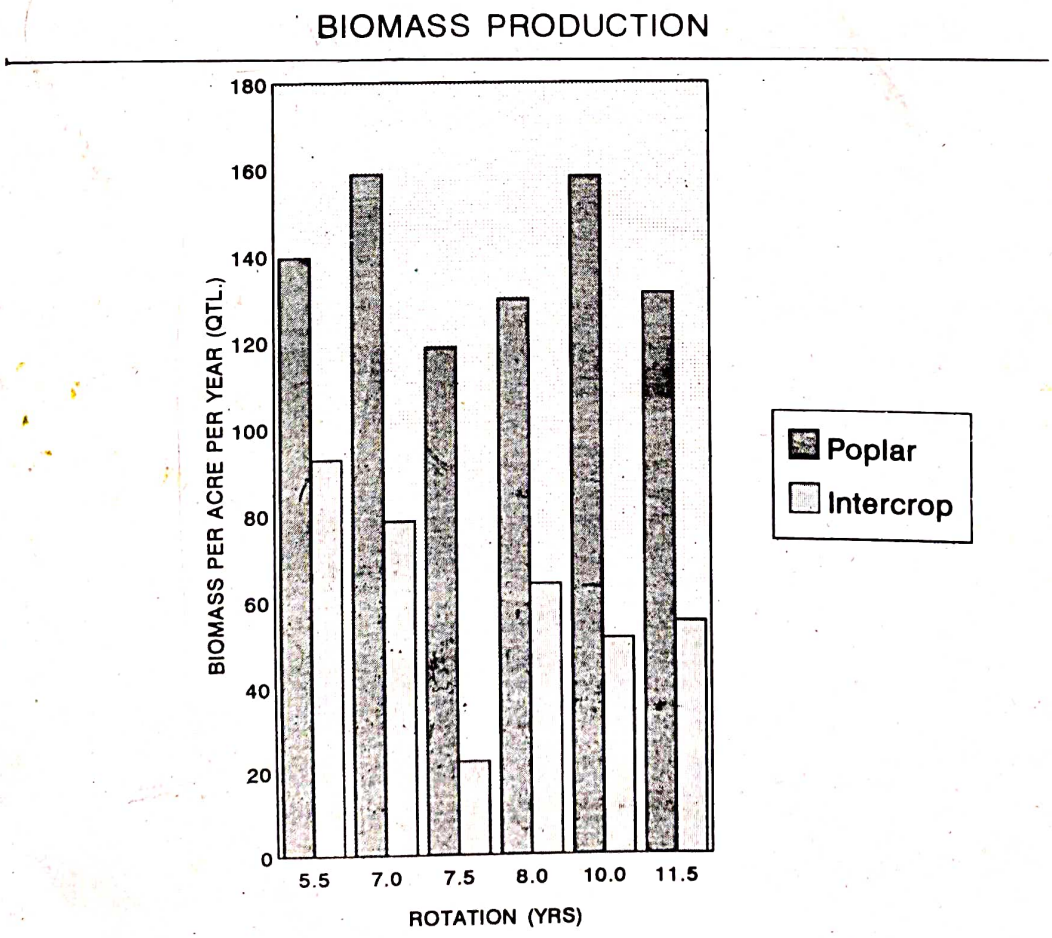
A.S.GILL

Peers + poplar + turmeric agroforestry model

A.S.GILL

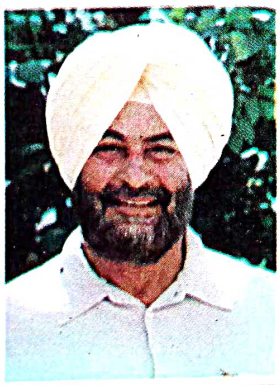
Agri - silvi-horti system: In between poplar tree mango orchard

Agri- silvi-horti system: In between poplar tree a fruit crop of litch
A.S. GILL



A.S.GILL

Poplar + mango/litchi + rajnigandha agroforestry model



Mr.Surinder Singh Hara is a practicing farmer and owner of Hara farms. He was as an agricultural expert with FAO and an agricultural consultant with the World Bank. Mr. Hara has held responsible positions in India including as a member, Board of Director/Management of the Oriental Bank of Commerce, Ltd. (sixteen years), Haryana Agricultural University, Central Soil and Water Conservation Research and Training Institute (ICAR)Dehra Dun .

Postal address : Hara Farms, P.O. Amadalpur,
Jagadhari (Haryana): 133101

Telephone : 91-1732-29615
91-1732-81444

In the vicinity of Yamunanagar district of Haryana, a large number of progressive farmers are totally committed to agroforestry systems. Shri Bharat Kalsia (Janak Niwas Chhachrauli) is practising of raising improved strain of turmeric in the interspaces of poplar. He has standardised the practice in a perfect condition and playing a major role in convinceing the other farmers in his locality to adopt the technology. Similarly the other farmers namely Sh. Raj Kumar Sarpanch and Sh.Biram Singh of village Khadiea are planting poplar in their respective fields. Sh.Satish Kumar is raising sugarcane in between poplar for the last 5 years. He says there is no adverse effect in sugar recovery in intercropping poplar with sugarcane.

A.S.GILL

Shri Bharat Singh a progressive farmer in front of his field planted with poplar + turmeric.

A.S.GILL

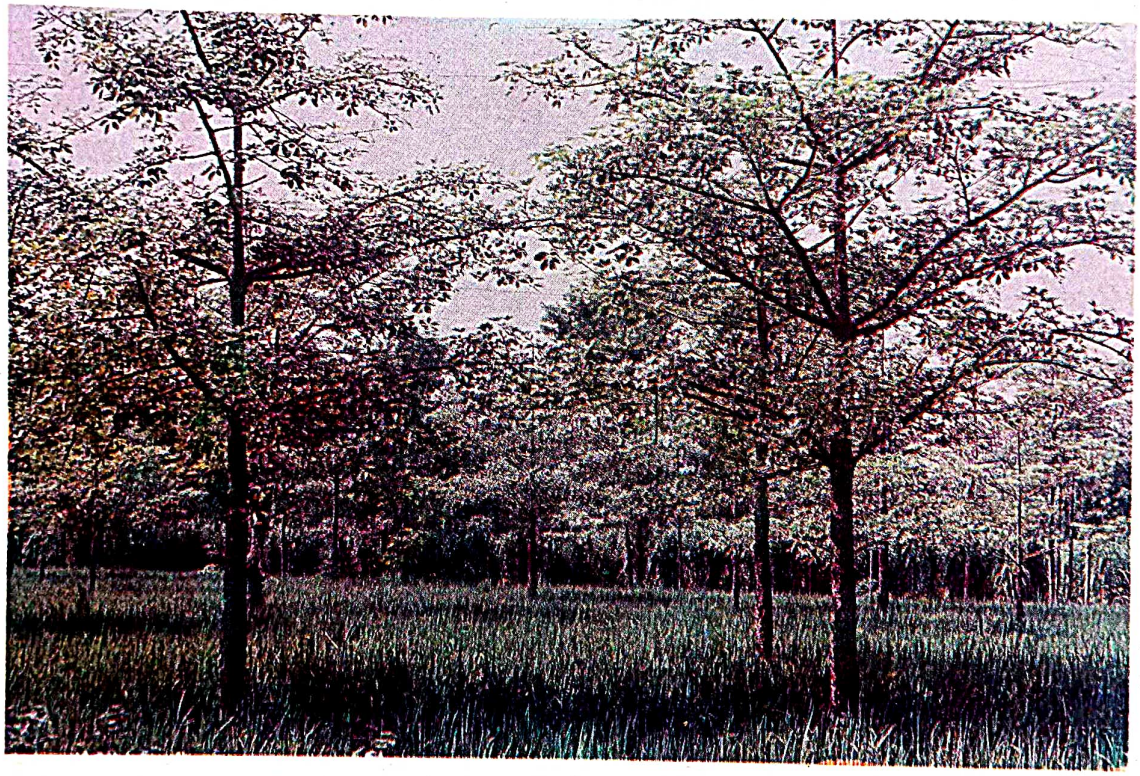
Poplar + turmeric agroforestry model.

Dr. A.S.Gill
NRCAF JHANS

RICE BASED AGROFORESTRY SYSTEM

A.S.GILL and A.K. Bisaria
National Research Centre for Agroforestry, Jhansi (U.P.)

Rice is a primary source of food for huge population all across the world. It is grown on about 10% of the earth's arable area. It is of paramount significance that 95% of all rice is grown in underdeveloped and developing countries of the world. However, the highest average rice yield i.e. 8.2 t/ha has been reported from Australia.



Rice based agroforestry model- Semal tree + paddy.

As a result of technological developments and their effective dissemination rice production rose from 20.58 million tonnes in 1950-51 to 81 million tonnes in 1994-95. Out of 185 million tonnes of food grain production of the country, rice contributed 81 million tonnes (43.78%). However, in the rice growing tract of the country, it has been experienced that yield of rice under agroforestry systems even does not qualify the average yield standards. It is to mention here that there is a considerable shortage of fodder, fuel and timber wood. Most of the available cowdung is used for making cake and is used for fuel purpose thus causing shortfall of farm yard manure. In order to fulfil the demand of fuel, fodder and timber, rice can also grow in association of trees in Punjab, Haryana, UP and Orissa.

Following trees are commonly used by farmers.

Common Name	Botanical Name
Poplar	Populus euramericana
Babul	Acacia nilotica
Shisam	Dalbergia sissoo
Semal	Salmelia malbaricum
Aam	Mangifera indica

Most of the farmers usually grow trees on the boundary of rice field. However, many farmers grow trees in fields. In the present situation, there is every need to grow nitrogen fixing tree species where foliage can serve as a source of green manure and its branches etc. for fuel purpose to overcome the problem of organic manuring and saving cowdung being diverted for fuel purposes.

The major constrain is the choice of the tree species and its canopy management for the rice based agroforestry systems.

A.S.GILL

Rice based agroforestry system: Mango orchard + paddy.

Keeping in view the botany of rice plant and its environmental requirement the tree species should possess the following characters :

1. Tree with erect and clean bole.
2. Diffused canopy with smaller crown.
3. It should be easy for canopy manipulation.
4. It should have the nitrogen fixing ability.

If a proper tree species with aforesaid characters is selected for a rice based agroforestry system there is scope for improvement in productivity of rice.

A.S.GILL

Shisam (*Dalbergia Sissoo*) tree in association with paddy

A.S.GILL

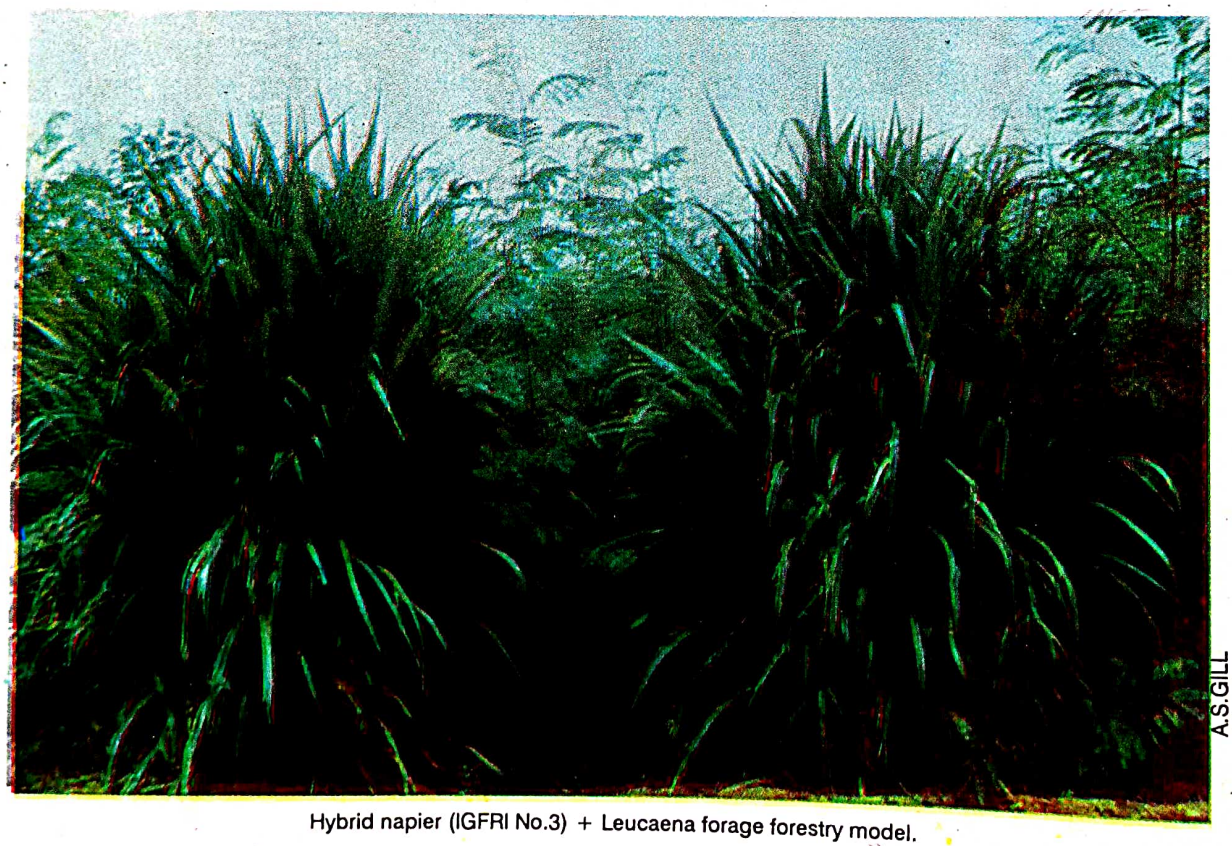
Poplar planted on field boundary with standing paddy crop.

IDEOTYPIC CONCEPT IN RELATION TO AGROFORESTRY

A.S.GILL
National Research Centre for Agroforestry, Jhansi (U.P.) 284003

Ideal selection of the genotypes in a given combination is of paramount importance. There can be reasons that in a combination the yield of one component is supressed by other associated component due to its aggressiveness. An ideal combination would be that there is greater compatability among the two components. In case of agroforestry systems, tree is the dominant component in most of the cases. Aggressiveness if any in the associated component needs special attention.

Under forage forestry studies it was noticed that with proper selection of one component enhanced the yield of the tree component. *Leucaena leucocephala* was the tree component. It contains high amount ot protein rich foliage and therefore, incorporation in forages can give greater nutrient out turn. The other component was perennial cereal high yielding forage crop known as hybrid napier. Hybrid napiers are very aggressive and therefore, attempts were made to select an ideal variety of hybrid napier which may give high yield as well as be compatable with his associated componant.

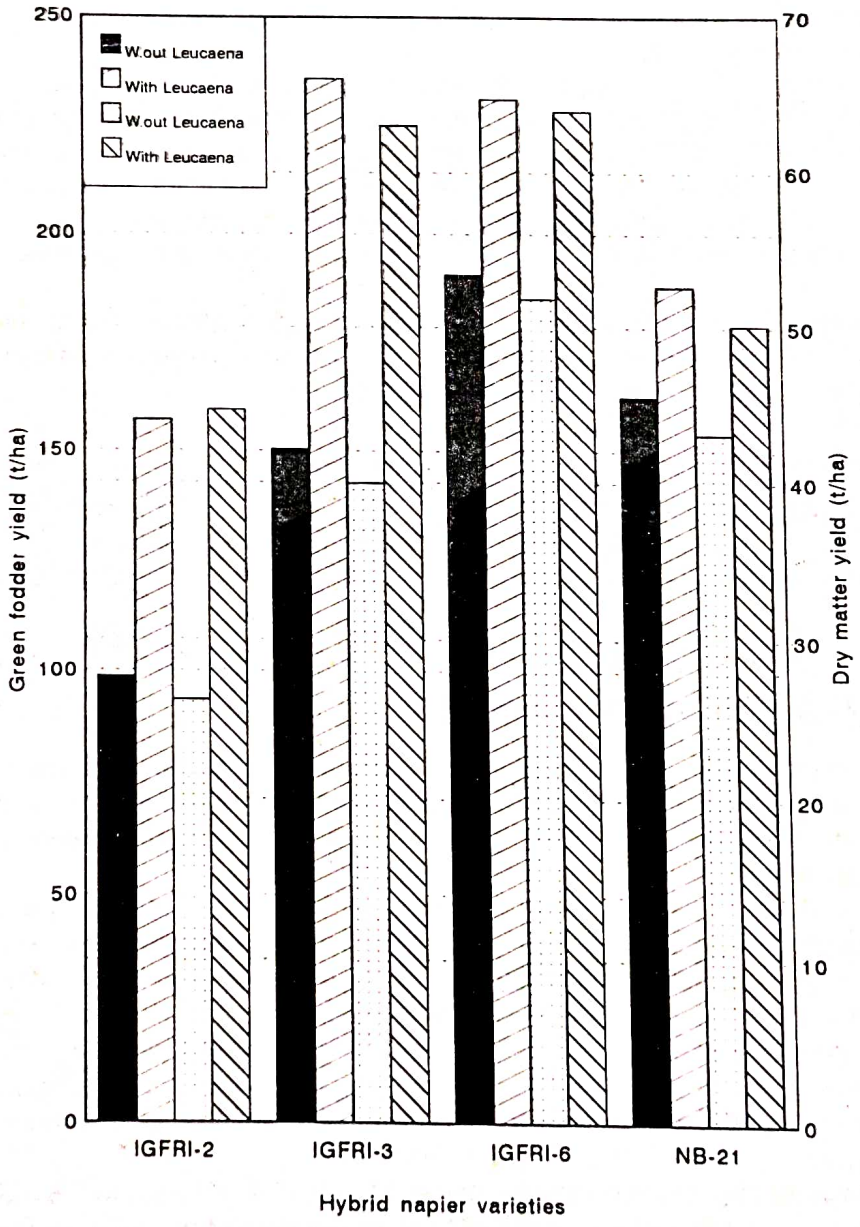


Hybrid napier (IGFRI No.3) + Leucaena forage forestry model.

Among the four varieties as tried (Fig.1), on monoculture basis, variety IGFRI-6 gave the maximum production followed by NB-21, IGFRI-3 and lowest being IGFRI-2.

Under forage - forestry treatments, on an average maximum green fodder yield was registered with leucaena + IGFRI-3 (235.7 t/ha) with 28% contribution through leucaena followed by leucaena + IGFRI-6 (231.7 t/ha) with 14% contribution through leucaena. In case of dry matter production maximum productivity (63.94 t/ha) was registered with leucaena + IGFRI-6 (Leucaena contribution 14%), however Leucaena + IGFRI-3 gave slightly lower production (62.99 t/ha) but contribution from leucaena was 29%. Forage having high amount of protein is preferred. High yield of leucaena in association with hybrid napier variety "IGFRI-3" is due to its compactness and erectn ess thus allowing greater opportunity for leucaena to yield high as compared to variety "IGFRI-6" which in turn hampered the Leucaena yield in its association.

Performance of Hybrid napier varieties planted pure and in association with Leucaena for forage yield



PERFORMANCE OF TREE SPECIES AND THEIR INFLUENCE ON GRAIN PRODUCTION UNDER RAINFED CONDITION.

V.N.Dod and B.N.Patil
College of Agriculture, Nagpur-440001 (Maharashtra)

A field experiment was initiated with two tree species (*Tectona grandis* and *Gmelina arborea*) with two spacings (8m x 2m and 12m x 2m) as assigned to main plots and Soyabean, Black gram and Green gram in the interspaces of the trees assigned to subplots. The tree species were planted during kharif 1992, on 1 to 2% slope on highly eroded medium soil, containing medium organic carbon, low nitrogen and phosphorus and rich in potash content with pH 7.8. Experiment was laid out in split plot design with three replications at Futala farm, College of Agriculture, Nagpur (Maharashtra).

The results revealed that tree species showed better performance and attained more than 90 per cent survival in the third year. The plant height was not much affected due to different tree spacings. However, *Gmelina arborea* had attained maximum height (1.34 m) in closer spacing. *Tectona grandis* had initially slow growth attained with average height of 1.19 m in wider spacing. Higher girth of *Tectona grandis* was observed in closer spacing. Girth of tree was not much affected by the spacings. The total biomass (woody and leafy) pruned branches of both the tree species were also recorded. Well distributed rains received in the first and second years were helpful for better growth of the trees.

In Kharif 1992 there was no adverse effect of associated tree species on grain production. During, Kharif 1993, with increase in the spacing of *Tectona grandis*, also increased the average grain yield of Black gram (10.40 q/ha) and followed by Green gram (9.40 q/ha) and Soyabean (6.40 q/ha).

POTENTIAL OF INTERCROPS WITH FRUIT TREES AND WOODY PERENNIAL UNDER DRIP IRRIGATION SYSTEM.

Ram Newaj and A.S.Gill
National Research Centre for Agroforestry, Jhansi

The intercropping arrangement of annual food crops and fruit trees/woody perennial is a land use system that tries to enhance productivity and ensure sustainability. At the same time it helps to stabilise slopes, minimise erosion and fill some of the farm needs. The right trees /shrubs, in the right arrangement /spacing and climatical environment provide a great potential for land productivity and protection.

Keeping in view the above point an experiment was initiated during 1990-91 by planting of four varieties of pomegranate (Ganesh, Kandhari, Jalour seedless and G 137) in a spacing of 5 x 5m with and without *Leucaena leucocephala*, a fast growing nitrogen fixing tree species. The experiment was laid out in randomised block design with three replications. The Leucaena was planted during kharif 1992.

For better development of fruit tree and minimise interference with crop it was subjected to yearly pruning of the side bran ches. The growth performance of different vaneties indicated that Ganesh has better growth performance compared to others. Drip irrigation system had better response on growth compared to conventional method (Table-1).

In the inter spaces of fruit trees blackgram was raised and yield of crop (Table-1) clearly showed that intercrop supplemented about 2.73 to 4.91 q/ha grain and 7.23 to 10.16 q/ha straw during 1993. During, 1994 due to excessive

rainfall in the early part of the season resulted in poor germination and growth which affected the crop grain yield. The pomegranate did not affect the yield of crops after four years of plantation.

In addition to intercrop, Leucaena also provided fuel and fodder each year. Leucaena was coppiced each year and produced about 11.29 to 14.02 q/ha fuel and 6.80 to 7.12 q/ha fodder during 1993. This yield was less during 1994 as compared to 1993. It may be due to the early termination of rain and high temperature during summer.

Table 1 : Growth performance of pomegranate and yield of black gram raised as intercrops with fruit trees.

Treatment	Plant height (m)		Canopy (m)				Grain yield (q/ha)		Straw yield (q/ha)	
	1993	1994	1993		1994		1993	1994	1993	1994
			N-S	E-W	N-S	E-W				
Control (Conventional method)	2.01	2.26	1.74	1.83	1.73	1.76	4.91	0.23	9.47	1.43
Drip System (Without Leucaena)										
Ganesh	2.11	2.34	1.69	1.97	1.89	1.99	3.18	0.35	7.8	1.81
Kandhari	2.24	2.42	2.12	2.04	2.24	1.45	3.75	0.36	10.16	1.43
Jalour seedless	2.07	2.29	1.61	1.70	1.68	1.08	2.73	0.25	7.23	1.45
G 137	1.07	2.29	1.86	1.28	1.85	1.76	4.25	0.31	9.76	2.66
(With Leucaena)										
Ganesh	1.99	2.10	1.79	2.06	2.04	2.17	3.58 (11.83)	0.65 (8.05)	6.2 (6.80)	2.55 (5.41)
Kandhari	2.49	2.61	2.01	2.05	1.94	1.96	4.61 (11.29)	0.48 (7.28)	9.48 (7.12)	2.40 (4.75)
Jalour seedless	2.21	2.36	1.87	1.88	1.87	1.85	4.66 (14.02)	0.38 (9.20)	9.48 (6.96)	1.70 (6.21)
G 137	2.13	2.40	1.78	1.88	1.87	1.85	5.06 (11.88)	0.45 (5.00)	10.98 (9.00)	2.08 (5.66)

Figure in parenthesis are fuel and fodder yield (q/ha) from Leucaena on dry weight basis

IDENTIFICATION OF MOST SUITABLE MPTS AND SPACING FOR ALLEY CROPPING AT JHANSI

P.Rai, A.S.Gill, Ram Newaj and N.Pandya
National Research Centre For Agroforestry, Jhansi

Alley cropping is a mixture of crop components which compete for growth resources from different depth of soil. Under rainfed condition annual crops fail due to low and erratic rainfall. Water is a major constraint especially in arid and semi-arid region and moisture level goes down below the root zone of annual crops. In such situation only deep rooted woody perennial species are capable to extract moisture from deeper layer of soils. Leguminous trees when grown in association with annual crops improve the soil fertility and meet the demand of fodder and fuel of the farmers. Looking to the importance of this system an experiment was initiated on alley cropping during 1991-92 with 4 alley species (*Leucaena leucocephala, Cassia siamea, Sesbania sesban* and *Cajanus cajan* perennial) raised in three widths (4,8 and 12 m) in randomised block design with four replications under rainfed condition to know the suitable MPTS (multipurpose tree species) as well as its optimum spacing for higher production of agricultural crops as well as fodder and fuel from the MPTS.

Alley cropping trial at NRCAF, Jhansi.

Six months old saplings of aforesaid species were planted during July-August 1991 in double row at 5 m length for each species. The distance between row was 50 cm and spacing within row was 25 cm. Alleys were pruned at the height of 75 cm twice in a year (June and December) each year. The first cutting was taken after one and half year during December, 1992. The leaves were mixed up in the soil as green manure to improve the soil fertility. Interspaces were utilized for growing crop during kharif season.

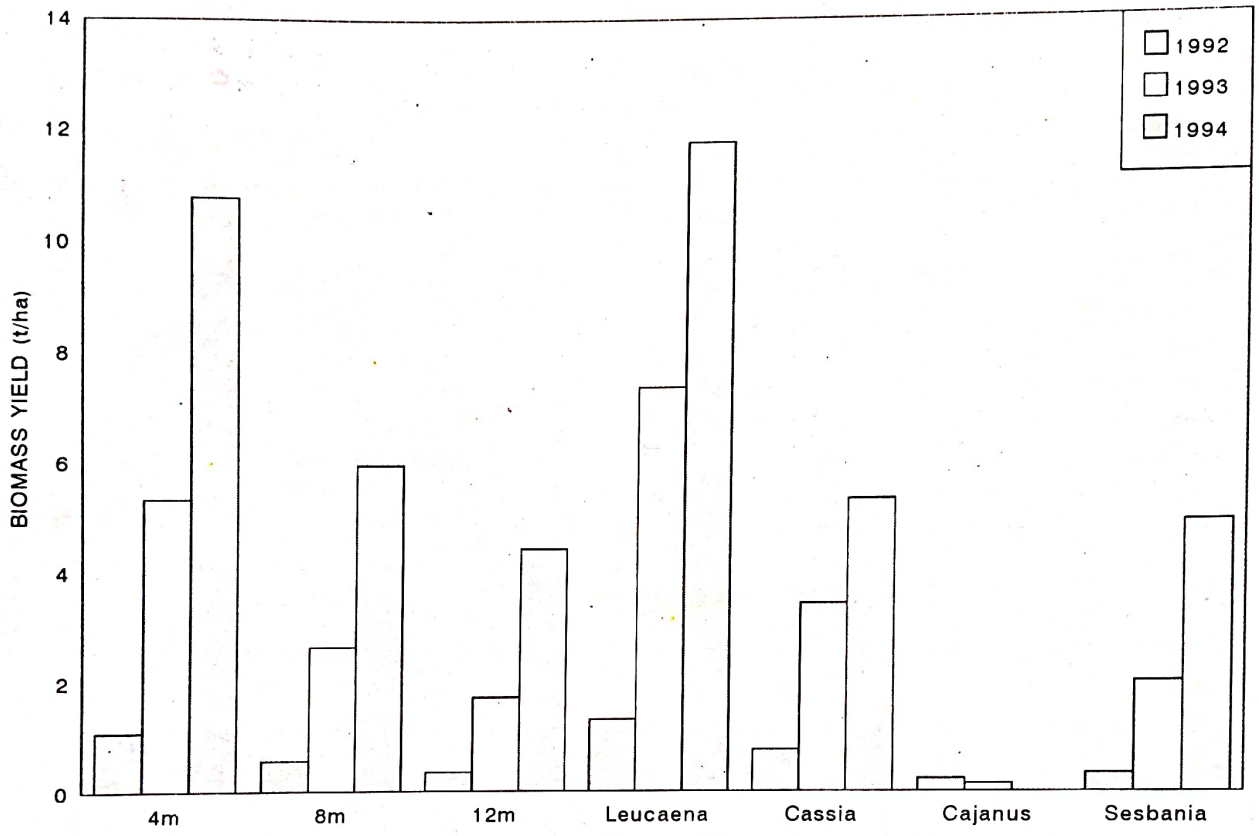
Total biomass recorded from 1992 to 1994 revealed that production of dry leaf and fuel wood increased in subsequent years in all the alleys except *C.cajan* (perennial). The total biomass obtained with *L. leucocephala* was maximum during all the years (Fig. 1) followed by *C.siamea* and *S.sesban*. While in case of *C.cajan*, the production drastically decreased in 1993 and none of the plants survived during 1994. This shows that *C.cajan* is not suitable for alley cropping system.

As regards to alley width, it was observed that the biomass production decreased as the alley width increased during all the years (Fig. 1). The maximum biomass recorded at 4 m alley width was 1.08, 5.35 and 10.80 t/ha in 1992, 1993 and 1994, respectively.

Although, production from agricultural crops could not be achieved in any of the years due to edaphic as well as erratic rainfall problems.

Thus, on the basis of biomass production it may be concluded that among the alley as tried *L.leucocephala* is the best alley species for Bundelkhand under rainfed condition.

FIG.1. DRY BIOMASS PRODUCTION (t/ha) UNDER ALLEY CROPPING SYSTEM IN RAINFED CONDITIONS



SURVIVAL OF FRUIT TREE SPECIES AND THEIR CULTIVARS IN RANGELANDS AFTER FIRE OUT BREAK.

S.K.Shukla, P.Rai and G.R.Rao
National Research Centre for Agroforestry, Jhansi

Twenty three fruit tree species and/or their cultivars (Table 1) were introduced in rangelands in 1994 with view to evaluate them and selection of best performing fruit tree species and their cultivars in horti-pasture system under rainfed conditions. These spp. and/or cultivars were introduced in natural grassland endowed with red gravelly soil with scattered stones both on surface and in sub-soil. In grass based agroforestry systems, occurrence of fire during extremely hot summers in Bundelkhand region is not uncommon. It was 7th April, 1995 when fire broke out at NRCAF field resulting in burning of fruit trees.

Plant survival (Table 1) recorded after fire outbreak, exhibited marked differences in the ability of fruit plants to tolerate the adverse effects of fire and to regenerate subsequently. The observations reflected that the fruit spp. viz. *Aegle marmlos* (Bael), *Morus rubra* (Red Mulberry), *Tamarindus indica* (Tamarind), *Limonia acidissima* (Kaitha) and *Emblica officinalis* (Deshi aonla) showed a survival of 80%, 80 %, 73%, 67% and 60% respectively after fire occurrence. Plant survival in Aonla cultivars viz. Chakaiya, Krishna, Kanchan, NA-7 and NA-6, *Zizyphus mauritiana* (Deshi Ber) and its cultivars like Ponda, Umran and Gola, *Psidium guajava* (guava) cv. L.49 and *Carissa carandas* (Karonda) varied

from 7 to 47 %. Cent per cent mortality was observed in *Z. mauritiana* cv. Banarsi Karaka, *Citrus aurantifolia* (Kagzi Lime), *Malpighia glabra* (Barbados Cherry), *Artocarpus heterophyllus* (Jackfruit) and *Annona squamosa* (Custard Apple). The above variation was attributed to the difference in the genetic make- up.

It can be concluded that the fruit species like Bael, Red Mulberry, Tamarind, Kaitha and Deshi Aonla are comparatively more hardy as compared to other tested species in the experiment as far as the occurrence of fire is concerned.

Table 1: Survival of fruit tree species in rangelands after fire occurrence.

Survival 60-100 per cent	Survival below 60 per cent	Cent per cent mortality
Deshi Aonla	Aonla cv. Krishna	Aonla cv. NA-10
Red Mulberry	Aonla cv. Kanchan	Ber cv. B. Karaka
Tamarind	Aonla cv. Chakaiya	Kagzi Lime
Pomegranate	Aonla cv. NA-6	Barbados Cherry
Kaitha	Aonla cv. NA-7	Jackfruit
Bael	Deshi Ber	Custard Apple
	Ber cv. Ponda	
	Ber cv. Gola	
	Ber cv. Umran	
	Guava cv. L-49	
	Karonda	

MAXIMISING PHYTOMASS PRODUCTION OF MULBERRY IN DEGRADED BOULDERY RIVERBED LANDS OF DOON VALLEY

Charan Singh and P.L.Saroj
Central Soil & Water Conservation Research & Training Institute Dehradun (U.P.)- 248195

An investigation was carried out at CSWCRTI,Research Farm, Selakui, Dehradun on bouldery riverbed land of Doon Valley to maximise the phytomass production of mulberry. The bouldery riverbed lands are characterized by high gravel content (about 74% under study site), poor moisture holding capacity due to high infiltration rate and low in organic matter content, thereby such lands are either lying vacant or occupied by uneconomical vegetations. Therefore, it was planned to utilise and rehabilitate such lands through mass plantation of suitable MPTS. Mulberry is one of the important MPTS. The leaves are fed to silkworm in sericulture industries, thinner twigs for basket making while thicker twigs used as fuel wood. Moreover, the phytomass productivity of mulberry is quite low in bouldery riverbed land as compared to lands with optimum soil depths.

In present study, the sprouted mulberry cuttings of uniform size were planted during July 1975 at the spacing of 2m x 2m (2500 plants/ha). The pits ($0.5m^3$ size) were filled with FYM and good soil (1:1). The following treatments Viz., T_1-Coppicing at 15 cm stumps height, T_2-Pollarding at 1.5m stem height, and T_3-75% lopping of the crown were imposed during 1985. The phytomass in form of leaves twigs (2-5 cm diameter) and fuelwood (2cm and 75 cm dia) were recorded in the month of October 1994. The experiment was laid out in RBD having three replications.

The data presented in Table 1 (Observations of 1994) indicated that the maximum total phytomass (kg/tree) was obtained from pollarding (15.5) followed by coppicing (14.3) and minimum in lopping (13.8). The twigs and fuel wood production were significantly more under pollarding then those of lopping and coppicing but the differences of twigs production between coppicing and pollarding were non-significant. However, the production of leaf fodder did not differ significantly under various management practices, though it was maximum in lopping (4.4 kg) followed by coppicing (4.2 kg) and minimum in pollarding (4.0 kg). Among various components, the maximum contribution was made by twigs of 2-5 cm diameter followed by leaf fodder and fuelwood. The foregoing study revealed that under degraded bouldery riverbed lands, the phytomass production of mulberry can be improved by pollarding which is a feasible silviculture practice than the lopping of the tree crown.

Table- 1 Effect of management practices on phytomass production of mulberry (kg/tree).

Phytomass	Treatments			C.D (P = 0.05)
	Coppicing	Pollarding	75% lopping	
Leaf fodder	4.20 (99.75)	4.00 (95.00)	4.40 (104.50)	NS
Twigs	7.00 (166.25)	7.30 (173.78)	6.30 (149.63)	0.80
Fuelwood	3.10 (73.63)	4.20 (99.75)	3.10 (73.63)	1.10
Total	14.30 (339.63)	15.50 (360.13)	13.80 (327.75)	

Figures in parenthesis are total phytomass (q/ha).

NATIONAL SEMINAR ON AGROFORESTRY FOR HIGHER CROP, BIOMASS AND SOIL PRODUCTIVITY FOR THE BUNDELKHAND REGION

(SPONSORED BY : International Development Research Centre, CANADA & Indian Council of Agricultural Research, New Delhi)

The seminar was held on 26-27 June, 1995 at National Research Centre For Agroforestry, Jhansi. The aim of the seminar was to bring together researchers and development agencies either government or private to interact and establish agroforestry programmes for sustainable production from different type of lands as well as maintaining the environmental equilibrium. The objectives of the seminar were (1) to review of the present status of agroforestry in the region, (ii) agroforestry as a sustainable land management system for the region, (iii) elucidation of the potential and limitation of various agroforestry system in the region and (iv) exchange of new knowledge, ideas and experiences with scientists, technocrates, developmental agencies, non government organisations for effective development of the region through agroforestry.

Plenary session of IDRC aided Agroforestry Seminar at NRCAF, Jhansi (Left to Right) : Dr. R.P.Singh (Director, IGFRI), Chief Guest Sh.Kalika Prasad IAS (Commissioner Jhansi Division), Dr. R.N. Prasad (ADG, AF, ICAR), Dr. A.Rekib (Director, CIRG), Dr. P.Rai (Organising Secretary) and Dr. A.S.Gill (Director,NRCAF)

In the seminar 63 delegates of different disciplines from various parts of the region participated including scientists, development agencies and NGOs working in the field of agroforestry. The seminar consisted of 6 technical session in which the following major themes were covered.

- Traditional agroforestry practices of the region.
- MPTS including fruit trees for various agroforestry production systems.
- Resource management for optimum crop/biomass/soil productivity and sustainability.
- Agroforestry systems service roles.
- Integrated wasteland management systems.
- Development of wasteland through agroforestry and afforestation.

In the above sessions, in all 31 research papers were presented under different aspects such as agrisilviculture, agrihorticulture, agri-silvi-horticulture, silvipasture, hortipasture, alley cropping, boundary plantation of agroforastry. In the inavgural session two publications such as NARCAF Research Highlight and Mango Based Cropping System Research were released.

Following important recommendations merged from the seminar.

- Agroforestry systems such as agri-horticulture and agri- silviculture can be very much effective for rainfed agriculture.
- Appropriate MPTS should be identified for ditterent edaphic situation for higher biomass production.
- Agroforestry systems can effectively minimise soil erosion, improve soil physical and chemical properties.
- Fodder production through agroforestry systems should be encouraged for economic livestock production.
- Farmers priorities should be indentified for proper implementation of the agroforestry programmes.
- Simple experimental design for different agroforestry systems- should be evolved.

Dr. P.Rai Principal Scientist (Agron), National Research Centre For Agroforestry, Jhansi: 284003 was the organising Secreatary.

Dr. A.S.Gill, Director, NRCAF, Jhansi having a discussion with the trainees from Ethiopia visiting the centre

Recommendation of SRC meeting (NRCAF) held during September 1-2, 1995

The SRC meeting of the centre was held during September 1-2, 1995 under the chairmanship of Dr. A.S.Gill, Director, NRCAF, Jhansi in the presence of panel of experts nominated by ICAR viz. Dr. S.Chinnamani, Ex-Assistant Director General (Agroforestry), ICAR, Krishi Bhavan, New Delhi; Dr. R.P. Dhir, Ex-Director, Central Arid Zone Research Institute, Jodhpur (Rajasthan); Dr. R.S. Dhanda, Prof. of Forestry, Punjab Agricultural University, Ludhiana. The scientists of the centre presented the findings of their research projects and after detailed discussion the following recommendation emerged out.

1. Technology should be developed for large, medium and small farmers. This should be circulated to all SAUs and ICAR Institutes.
2. The reduction in yield should be explained in context with the environmental factors for which metrological data should be collected regularly.
3. All the data showing either negative or positive results be explained on scientific basis and negative information is also of paramount importance.
4. The emphasis to be given on basic research in addition to applied research.
5. All the experiments conducted at the centre for more than 6-7 years may be concluded and on the basis of useful information, new experiments to be conducted on plot basis instead of single rows. However, these experiments may continue but observation to be taken only once in a year.

SRC meeting at NRCAF, Jhansi on Sept. 1-2, 1995. (Left to Right)

Front Row: Dr. A.K.Bisaria (Sr.Sci.), Dr. B.Lal (Sr. Sci.) and Dr. Anil Kumar (Sci. Sr.Scale).

Second Row: Dr.R.S.Dhanda (Expert), Dr. S.Chinnamani (Expert), Dr. A.S.Gill (Director), Dr.R.P.Dhir (Expert)

and Dr. P.Rai (Pr.Scientist).

6. The data obtained so far and likely to be obtained in future be stored in good quality floppies so that it could be analysed as per its requirements as and when needed.
7. The centre should develop models for different agro- ecological zones so that it could lead other SAUs and ICAR centres of agroforestry.
8. Alround efforts should be made for more meaningful cooperative research in the field of agroforestry with other ICAR centres and SAUs.

In addition to above said recommendations on ongoing projects, the panel of experts also suggested to give emphasis on the following lines:-

1. Pure silviculture.
2. Social science in relation to economics and extension.
3. Animal science in relation to livestock production and environment.

Dr. P.Rai
PS (Agron) & Secretary, SRC

Dr. Dhiman, Dr. Chinnamani, SRC Panel Experts visiting on-station trials at NRCAF, Jhansi

Experts and farmers at the kisan Ghosti as organised at NRCAF, Jhansi on Sept. 15th, 1995

Kisan Diwas NRCAF, Jhansi (Left to Right) Dr.B.Lal (Convenor), Dr.A.S.Gill, (Director, NRCAF), Col. P.S.Sharma (Chief Guest) and Dr.L.P.Misra (Director, IGFRI, Jhansi)

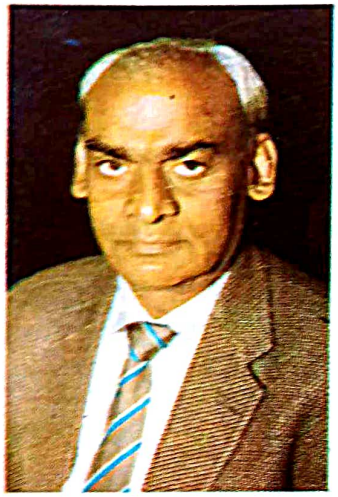
NATIONAL RESEARCH CENTRE FOR AGROFORESTRY JHANSI (U.P.) 284003

NRCAF publishes AGROFORESTRY NEWSLETTER QUARTERLY which covers all aspects of agroforestry including review on New Books, Vital News and Information about Symposial/Seminars/Workshops, Meetings etc.

Material for Agroforestry Newsletter and information for the Directory may be addressed to:

The Director,
National Research Centre for Agroforestry,
Gwalior Road,
JHANSI- 284003 (U.P.) INDIA

CONGRATULATION



Dr. K.R. Solanki, a renowned agricultural scientist has joined as Director of National Research Centre for Agroforestry on 30th December, 1995. Prior to his joining at the Centre he served as Botanist and Forage Breeder, Haryana Agricultural University, Hisar and Principal Scientist & Head of the Division, Perennial Cropping System, Central Arid Zone Research Institute, Jodhpur.

Dr. Solanki is not only Scientist but also a good Teacher and five Research Scholar have received Ph.D. degree under his able guidance.

Dr. Solanki had visited Switzerland, U.K., West Germany, kenya, Sudan, Burkina Faso and Italy as fellow, teacher and or delegate during recent past.

He had made significant contribution in the area of forage and tree breeding and developed agroforestry system at CAZRI, Jodhpur.

Dr. Solanki is a well known Plant Breeder and has more than hundred research papers, articles and five technical bulletins to his credit.

Dr. Solanki is a recipient of prestigious ICAR Award for Team Research on Tree Improvement as a Team Leader during 1991-92.

We hope that the vistas of agroforestry would flourish under his able and dynamic leadership.

EDITORS

The agroforestry newsletter aimed at providing important highlights on research, development, education and training in India published quarterly by the National Research Centre for Agroforestry (ICAR) Jhansi. Contributions, letters, comments, querries, etc. on any aspects of agroforestry may be sent to Director, NRCAF, Jhansi (India) : 284003

Published bY :

Director,
National Research Centre for Agroforestry (NRCAF),
Gwalior Road, Near Pahuj Dam,
JHANSI (U.P.) 284003 INDIA

Cable : **KRISHIVANIKI** FAX ; (0517) 442364 (0517) 449479
Phones: (0517) 448213 (0517) (0517) 448214
E.Mail : nrcaf @ x 400. nicgw. nic. in

Printed at : Veer Bundelkhand Press (Offset Printers), 178, Gusainpura, Jhansi. Phone : 0517-440931