THEME:
AGROFORESTRY AND FARMER INCOME

Title of technology

Development of grafting technique in for clonal propagation of Ardu (*Ailanthus excelsa* Roxb.)

A Nature of technology

Grafting technique for clonal propagation

B Process in brief

Grafting experiments were conducted in February, March and April months using two methods viz. Wedge and Patch grafting, in this species. Wedge grafting (grafting success ≈ 50%) gives better results as compare to Patch grafting (Fig. 1). Since success was higher in Wedge grafts, this method is described in following paragraphs.

Fig. 1. Wedge and Patch grafts in Ardu

One year old hardy seedling rootstock (with 0.5-.7 inches stem dia at 4 inches height) from nurseries was selected. Such seedling root stocks can be raised and harden for one year in a big polybog (15 x 25 cm.) with proper soil mixture (sand:soil:FYM in the ratio of 1:1:1, v/v). Seedling rootstock off 3 to 4 inches above the soil line was cut by using sharp, clean pruning cutters and makes the cut straight across the top. Sixty days old scions were collected from sprouts of 7 to 10 year old selected female or male trees. Both scion and rootstock of same

thickness were used for grafting experiment. The selected scion was cut across the bottom into a 3-inch section. Excess of leaves were removed leaving one to two leaves at the top of scion. The rootstock top was cut in "v"-shaped notch (1/2-inch-deep triangular wedge) in the wood by using sharp, clean knife. Similarly, bottom of the scion was cut into a 1/2-inch-long wedge shape so that it can slip and fit perfectly inside the notch of rootstock. Bottom of the scion was gently pushed into the notch in the rootstock and wrap it with parafilm strip. The wrapping started 1 inch below the bottom of the graft and extend it up 1 inch past the graft. During this process care was taken to minimize the desiccation of scion and rootstock and removal of new sprouts from rootstocks if any, so that root stock support only scion and establishes strong graft union. Such grafted plants were kept in mist-polyhouse for initial two weeks than transferred to shade house for 8-10 weeks for proper hardening. Plants were ready for planting after 3 months of grafting. At nursery stage graft union was observed within two months period and as such incompatibility between root stock and scion was not observed.

C. Beneficiaries of the technology

1. Prominent beneficiaries/user groups

This technique can easily be adopted by farmers and field staff of forest departments. It is equally beneficial to firms which are exploiting Ardu for fodder, timber or biomass.

2. No. of clients to whom technology has been transferred/sold

Grafting technique of Ardu has been disseminated to farmers and SFDs through trainings and workshops. It has also been popularized by print media such as AFRI Darpan (Hindi) and AFRI's information brochure.

3. Potential for further dissemination (As the case may be)

Present technique has potential and wider applicability due to its simplicity to farmers and SFDs (*Ailanthus excelsa* is a fodder species and provides biomass, fuel wood and timber. It is applicable for multiplication of selected female or male Ardu trees for plantation activities with enhanced fodder productivity of agriculture/forest lands in Rajasthan and Gujarat states.

D Economic significance

1 Potential to address livelihood issues and generate additional income

Rajasthan has about 11% of livestock of the country. There is a demand of 76.5 million tons of fodder in Rajasthan, but the supply is only 56.1 million tons in year 2006 (Source: Animal Husbandry Department, Rajasthan, 2010) leaving a gap of 20.4 million tons fodder in Rajasthan. Moreover, with the increasing pressure on land for growing food grains, oil seeds and pulses and diversified use of agriculture residues, the gap between the demand and supply of fodder is increasing. Ardu is considered second after Khejari (*Prosopis cineraria*) for fodder due to wider

adaptability and higher tolerance to biotic and abiotic stresses. Thus promoting this species with higher fodder yielding clonally propagated planting stock can help in reducing this gap between demand and fodder supply.

2 Productivity enhancement and economic benefits over replaced technology

Presently *Ailanthus excelsa* plantations are raised through seeds, where gender, quality of seedling and high productivity cannot be assured. In this species, no economically viable clonal propagation technique is available so for. Thus, developed grafting technique can be useful to farmers and state forest departments to propagate selected female plants to improve fodder productivity of the area. Productivity can be enhanced a minimum of at least 10 % of the selected female plants by present grafting technique. Productivity can be further enhanced by supplementing other silvicultural practices along with this technique.

3 Impact of the technology (As the case may be)

A demonstration trial of male female plants raised through grafting has also been established in 2008 in experimental area of AFRI (Fig. 2). These studies indicate that female plants have shown 10% higher growth in height and girth diameter as compare to male plants after three years of planting. It is a clear indicator that productivity can be enhanced by this technique.

Fig. 2. A demonstration trial of male and female *Ailanthus excelsa* grafted plants

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