In situ technique to establish *ber* orchards in arid region

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Cover photograph:

Front : *Ber* cultivar Gola developed by *in situ* technique
Inset : Fruiting twig of *ber* cultivar Gola
Back : *Ber* orchard developed through *in situ* technique

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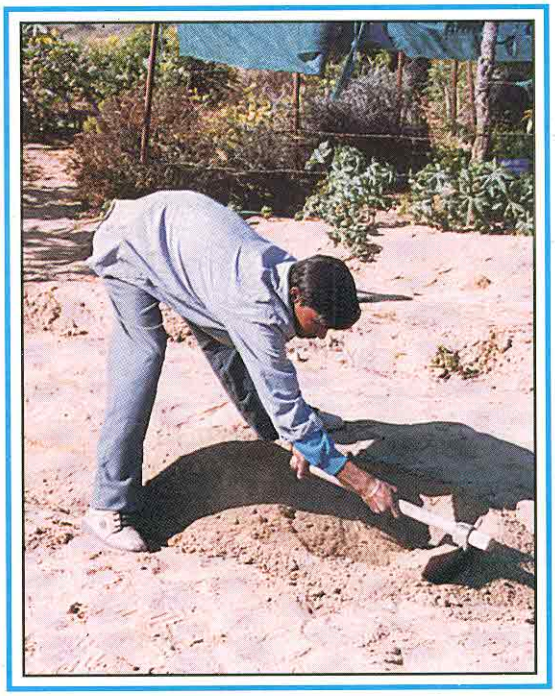
In situ technique to establish *ber* orchard in arid region

The drought hardy *ber* gives good yield of high quality fruit even under fragile environmental conditions of arid region, since its vegetative growth and reproductive phase coincide with the maximum moisture availability period of this region. Thus, once a *ber* orchard is established, its cultivation provides considerable insurance against the famine conditions recurrent in this region.

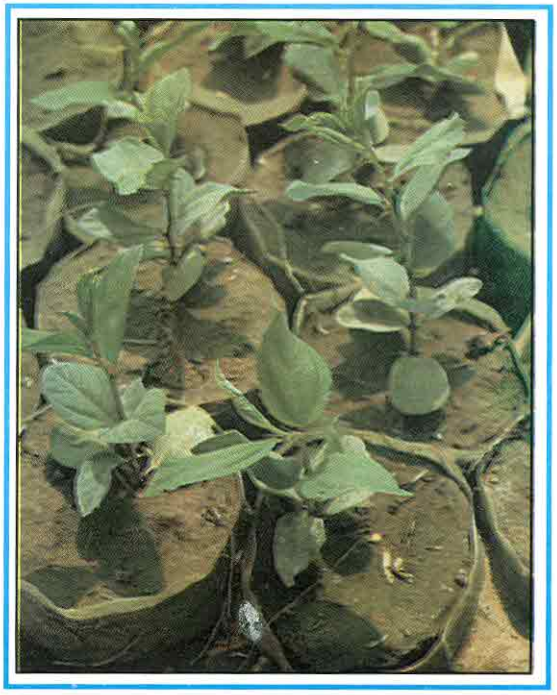
The establishment of orchard is, however, very difficult under hot arid environment. *Ber* orchards are generally established by planting nursery-raised budings. Alternatively, it can also be done by *in situ* planting tech- nique. When raised by the traditional methods, i.e. by transplanting budded plants raised either in polythene bags or tubes or in a nursery, the root system of the plants gets modified according to the growing conditions. In polythene bags, root coiling takes place whereas considerable injury takes place to their roots at the time of trasplanting when raised in nursery beds. By *in situ* planting technique, however, straight and well distributed root system develops since the roots remain undisturbed and undamaged. The technique also helps growth of trees in an orchard without any age difference because root system remains undamaged and continues growing even when budding season may be different. Consequently not only the per unit area productivity is higher but is also sustained.

The Technique

1. A mixture of FYM, sand and clay in equal proportion is prepared which is filled in 25x10 cm size polythene tubes (having open bottom) by keeping the tubes in place in sunken nursery beds of 6.0x0.8x0.3 m dimensions during March-April.

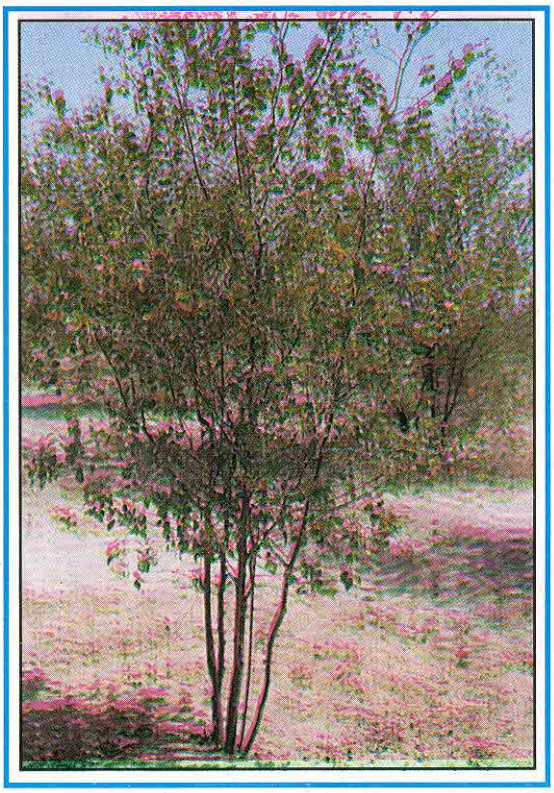


2. Seeds (kernels) of *Ziziphus mauritiana* var. *rotundifolia* (*boradi*) are extracted by breaking the stones. Two seeds are sown in each tube which germinate within 10 days. The germinating seedlings are given proper care to obtain proper rootstock thickness. After every second irrigation, the crust on soil surface in the tube is broken with the help of thin iron pegs or wire. To improve seed germination, only viable and undamaged seeds should be sown. This can be easily ensured by dipping the seeds in water or in 2% salt solution. The floating seeds are discarded.

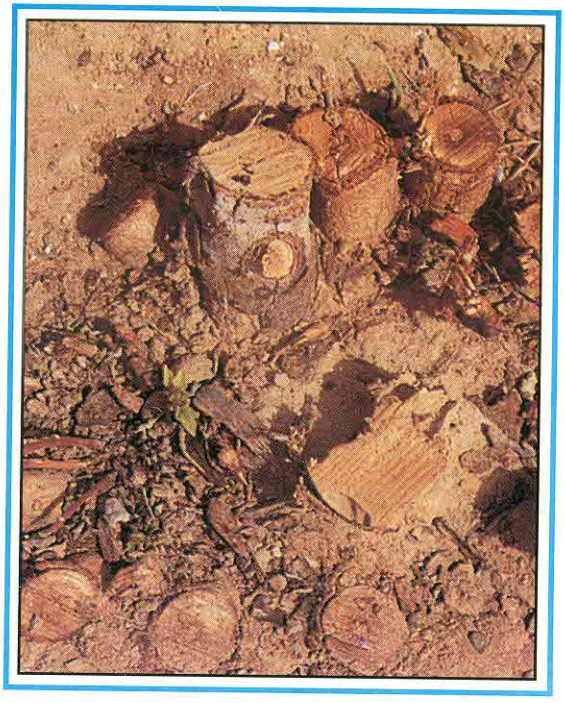


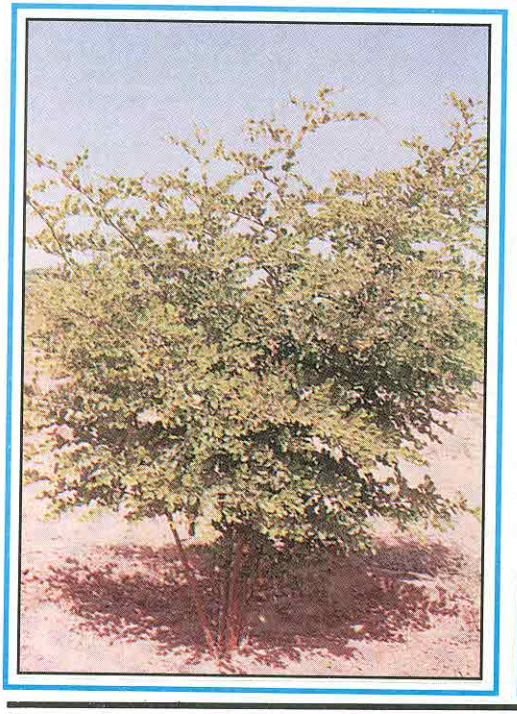
3. The seedlings become ready during June-July for trasplanting in a laid out field. Alternatively, 2-3 seeds can be sown during July-August directly in the field as per lay out to raise rootstocks *in situ*. This may sometimes result in a variable stand and vigour of the rootstocks in the field.

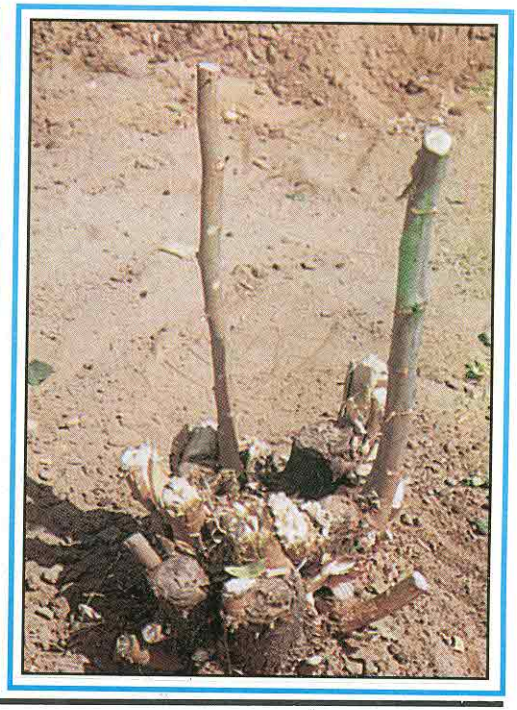
4. After planting, proper management practices are followed to develop rootstock having good root system. After about 10 months, the rootstock bushes develop into multi-stem bushes.



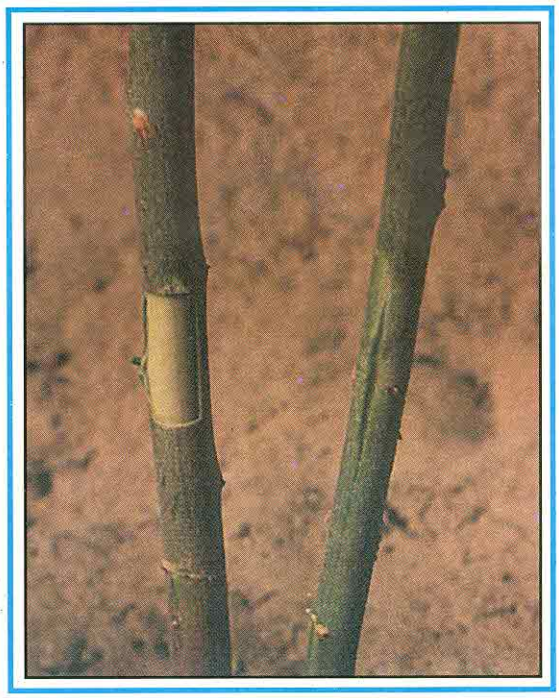
5. These multi-stem rootstocks are cut back from the ground level during end of May. Within a month, the rootstock throws as many as 8-10 shoots from the ground level. During July-August, 2-3 vigorous shoots are finally retained by thinning out the others.

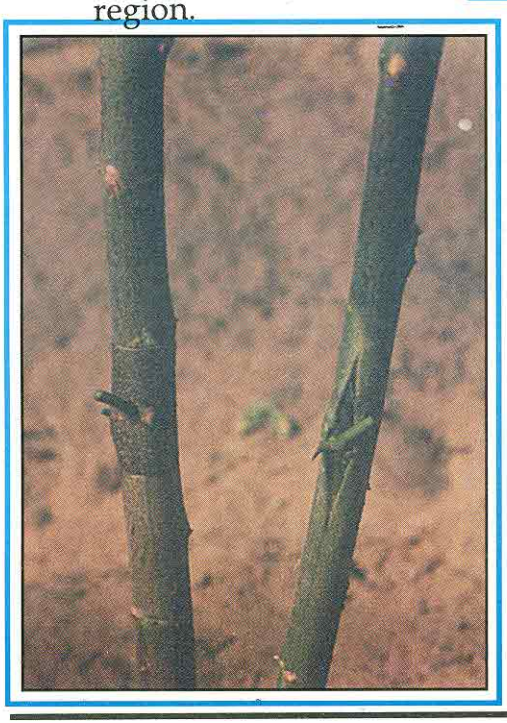






6. The selected shoots are lopped at about 30-45 cm height during July-August and are budded with scion buds of desired cultivar at 15-20 cm height by patch or 'I' method. At least two shoots are budded at each point and are allowed to grow for one year to safe-guard against gaps in the orchard due to damage by biotic or abiotic factors common in the arid region.

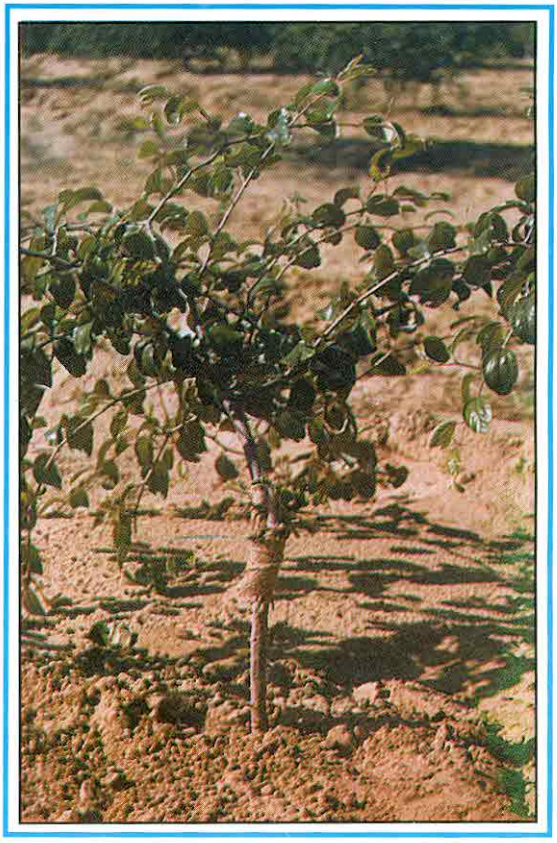




7. The scion buds sprout within 7-10 days. Wild sprouts emerging from the rootstock portion should be continuously removed. When the bud success is ensured, the rootstock portion above the bud union should be lopped. This helps to induce upright growth from the scion bud. In case budding fails, the same rootstock can be reused in the following year. Since the root system continues to develop, not much age difference occurs in the trees in the orchard.

8. During next May-June, only one of the two budlings are retained removing the weaker one. This budling is allowed to grow to develop primary, secondary and tertiary branches.

9. Protection from damage by low temperature or frost during the winter should be ensured by covering the stionic union with jute strips.



The *in situ* planting technique, thus, helps to develop productive *ber* orchards even in the marginal agroclimate of arid region. Once established, these trees require little care since they have a natural, undeterred, strong and deep penetrating root system.