

Lab-to-Land

The success story of betelvine cultivation in Mahoba, Uttar Pradesh

V R BALASUBRAHMANYAM, R S CHAURASIA AND J K JOHRI

National Botanical Research Institute

Lucknow - 226 001, India.

Introduction

Betel leaf chewing is so common that it is taken for granted and most people are oblivious of the problems facing this important segment of plant industry. Essentially betelvine is a plant of humid tropics and the hot arid areas of North India are not ideal for its cultivation. But over the centuries, it has been demonstrated that under intelligent and assiduous care, betelvine can be grown with economic success by adopting suitable techniques to circumvent adverse climatic conditions. It is grown in conservatories which are specially designed to maintain conditions of moisture, humidity, temperature and light conducive to proper growth of betelvine. Ironically, these are very ideal conditions for the development of destructive diseases such as foot and leaf rot (*Phytophthora palmivora*), anthracnose (*Colletotrichum capsici*), leaf spot and wilt (*Xanthomonas campestris* pv. *betlicola*) that affect betelvine. Betelvine cultivation is beset with many taboos and beliefs which have kept it away from modern agricultural practices. The conservative outlook of betelvine cultivators is also probably the reason why betelvine cultivation did not attract the

attention of agricultural scientists who have otherwise made valuable contribution to the improvement of almost all commercial food crops. With the result, there has been a gradual but perceptible decline in its cultivation.

Mahoba in Haripur District of Uttar Pradesh is famous for its high quality Desawari 'pan'. It is said that about 160 ha was under 'pan' cultivation and was the sole occupation of about 5000 families. There was decline in betelvine cultivation in late seventies. It was observed during 1979 in Mahoba that out of 108 betelvine plantations covering 30 ha, about 60% were diseased. None of the cultivators practiced disease management measures using chemicals. Taking note of the decline, the Uttar Pradesh Council of Science and Technology sponsored a project on betelvine at National Botanical Research Institute in 1980. In subsequent years the District Rural Development Agency, Hamirpur provided financial support to the project.

Package of practices

Based on results of investigations on various aspects of betelvine cultivation, a package of practices was developed to

increase the yield per unit area, improve the quality of leaves, minimise losses due to diseases and pests resulting in cost-effective management of betelvine plantations. Use of healthy, disease-free planting material for propagation and fresh water for irrigation, soil drenching and treatment of cuttings with streptomycin (500 ppm) and Bordeaux mixture (0.5%) before planting and spraying of vines with Bordeaux mixture at regular intervals during rainy season were some of the preventive measures that were adopted to minimise losses due to diseases.

It was observed that a number of farmers used flours of wheat, rice and fenugreek seeds, curd, groundnut oil and castor oil as additives to supplement oil cakes and fertilizers, presuming that application of these items improved quality and increased the yield of leaves. The cultivators usually used til oil cake (*Sesamum indicum*) which is three times costlier than neem cake recommended by the Institute. The results of long term manurial trials showed that to get optimum yield, application of neem cake and neem coated urea at 150 kg N/ha in combination with superphosphate and muriate of potash at 100 kg P and K/ha, respectively, was sufficient.

Extension strategy

At the very beginning, it was realised that the ultimate success of betelvine development programme lay in effective extension. Hence an extension strategy was developed with imaginative improvisations suiting the local situation. Demonstration camps, betelvine growers-scientists get-togethers, training of young cultivators in improved agricultural practices, supply of disease free propagating stock, free distribution of literature, wall

posters, newspaper articles etc. were the main planks of the extension strategy. A video film of 45 min duration was also produced on betelvine research and its application in the field, to serve as a media to educate the cultivators on improved agricultural practices. The film included technology packages developed by the Institute to overcome some of the problems faced by the betelvine industry.

Advisory service

The Institute also organised an advisory service for betelvine growers under the scheme sponsored by the National Bank for Agricultural and Rural Development. Recommendations were made on the basis of actual visits to problem conservatories and examination of disease/pest affected plants and soil. About 500 cultivators availed the advisory service offered by the research team every year from throughout the state and a few from other states too.

Efforts were made to build close and lasting personal contacts with as many growers as possible. Apart from intensive touring into the area, it was the policy of the Institute that any request or complaint howsoever trivial from a betelvine cultivator, must be attended to immediately. Periodical visits were also made to follow up the progress resulting from the action taken.

Scientists-farmers-get together

During the get-togethers, district officials like District Magistrate, Plant Protection Officer, District Agricultural Officer etc. were also invited to participate in the discussions and a good rapport was established with them. The farmers were offered loans for the establishment of betelvine plantation on

differential rates of interest. In Mahoba alone, more than Rs 15 lakhs were disbursed as loan to about 300 growers who were beneficiaries of different government schemes.

District and block level officials also fully cooperated in the programme of action. The Plant Protection Department made available pesticides at government rates and sold sprayers at subsidised rates to growers. Bamboo is one of the major inputs in the establishment of betelvine conservatories. Large quantities of bamboos are required for the framework of the conservatory and as supports for betelvine. The District Forest Officer when appraised of the situation opened a government Bamboo Depot at Mahoba, to sell bamboos at government rates to growers.

Demonstration trials

The efficacy of pest and disease management practices in minimising losses due to pests and diseases was demonstrated in 60 cultivators' conservatories. In a trial carried out in over 20 growers' fields, to stress the efficacy of prophylactic measures in minimising losses due to disease and also to demonstrate the benefit-cost ratio of disease and pest management, the ratio ranged between 4.21 and 8.81. At the training camps organized every year, about 80-100 betelvine growers participated. About 14,000 'dolis' (1 'doli' - 200 cuttings) of setts sufficient to plant 14 ha were treated with streptomycin (500 ppm) and Bordeaux mixture (0.5%) for supplying disease-free propagating stock to the cultivators.

Irrigating the right way

When the project was initiated in Mahoba it was observed that a majority

of growers practiced pot irrigation, an operation which is not costly but also difficult during summer season, when labour is difficult to get. During the annual growers' meet, firms dealing in portable irrigation pumpsets were asked to demonstrate the usefulness of small pumpsets in irrigating the vines. As the betelvine conservatories are established on raised mounds, bed or surface irrigation is not possible. Since the stem of the vine is less than pencil thick and irrigation during summer involves not only wetting the soil around the roots but spraying and drenching the entire foliage, a delivery pipe of 4 cm diameter was sufficient for irrigating the vines. Efforts were made to get loans from cooperatives to purchase pumpsets and subsidy to the cultivators under different development projects. As a result of such efforts, about 95% of the growers in Mahoba have taken to pumpset irrigation as they have realised that irrigation with pumpsets costs only one-tenth of the recurring expenditure incurred on pot irrigation. Even landless farmers who could not afford to purchase pumpsets, now hire them at Rs. 16 per h from those who own the pumpsets.

Training of cultivators

The role of National Botanical Research Institute as the nodal agency for training of betelvine cultivators on improved agricultural techniques has grown both in scale and scope under a scheme of technology transfer sponsored by the National Bank for Agricultural and Rural Development. So far about 100 cultivators were trained in 5 batches of 20 each. The Institute monitors the progress of the trainee cultivators by offering consultancy services under the scheme.

By 1985, improved agricultural practices became very popular among the betelvine cultivators. Within 5-6 years, the acreage under betelvine rose from 70 acres to 500 acres. As a result of improved agricultural practices, the quality of leaves also improved resulting in a better market price. Due to prophylactic measures adopted by farmers, the leaves can be sold at a premium price during lean season because of improved quality and demand in the market. During 1988-91, when there was increased productivity, 60% of growers retained their crop as 'Baisakhi pan' (a practice done in parts of Uttar Pradesh and Madhya Pradesh to retain the leaves on the vine during winter to prevent leaf fall so as to harvest them during May-June lean season, when the market rates are high) and obtained remunerative price for their produce.

Epilogue

The story of this successful fight against problems of betelvine cultivation is a gripping story of onward march in the face of many obstacles. There might have been failures and much remains to be accomplished. Some betelvine diseases still resist efforts for their control. Though methods were developed for prevention of diseases, they are costly for the cultivators as 90% of them are marginal farmers or landless. The cost of establishment of a betelvine conservatory is quite high-as much as Rs 1 lakh per acre. Marketing is quite unorganised and middlemen exploit the cultivators as betel leaves are a highly perishable commodity. But as the grower grapples with these problems, he will have in the background, scientists working with him with the knowledge he needs to lighten his economic load and permit him to produce betel leaves economically and efficiently.

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