Education and afforestation in Malta

Saliba L.J.

L'environnement

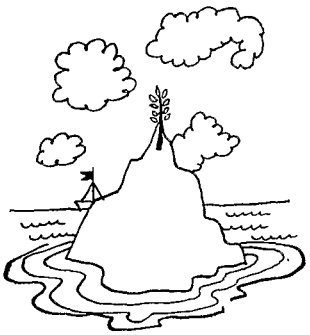
Paris : CIHEAM
Options Méditerranéennes; n. 9

1971
pages 84-85

Dr. Louis J. SALIBA,

Head, Plant Protection Section, Department of Agriculture and Fisheries, Malta

Education and Afforestation in Malta



One of the salient geographical features of the Maltese Islands is the comparative lack of indigenous arboreal vegetation. Originally, as far as can be ascertained, the predominant vegetation appears to have been evergreen forest, but a complex of factors, both natural and artificial, have contributed to the present rocky terrain and poverty of flora. In many localities, both coastal and inland, the prevalent landscape is bare rock, variously pitted with small to medium soil-pockets, in which patches of herbaceous (and occasionally wordy) shrubs are evident. Over the remaining parts, the soil stratum is very thin, in many instances forming a shallow coat varying between 25 and 100 cm, beyond which the underlying rock is exposed.

It is probable that the bulk of primitive trees were felled for their timber between 2000 B.C. and 1 A.D. and that a gradual process of erosion produced the present conditions. In fact, since the earliest records, it is evident that the history of Maltese Agriculture can be easily described as one long continuous effort at soil-conservation. This, however, is only one of the problems acting against the re-establishment of a thriving arboreal flora.

Briefly, the main factors limiting the growth of trees in the Maltese Islands can be described as follows:

(i) *Soil Scarcity.* — Except in a few regions, the depth of soil is unsuitable for normal growth and vertical organisation of the root-zone. In hilly areas, because of constant erosion by wind and rain, the soil has to be conserved by terracing fields with hand-made rubble walls, the amount of soil available making the fields only suitable for ground-crops.

(ii) *Soil Conditions.* — The soils of Malta are of three main types (Terrarossa, formed from Coralline limestone, Xerorenzina, from Globigerina limestone, and Carbonate raw soils from fragmented upper Globigera and clay). Because of physical transport of soil from building sites all over Malta onto areas intended for cultivation, most of the fields now contain a soil complex not easily identifiable. Moreover, the soil, through admixture with limestone particles, originating from building operations and dispersed, by wind or otherwise, is strongly alkaline, with a pH value averaging about 8.8. The high calcium content induces iron-deficiency, and above all, no trees (or indeed other plants) can grow under natural conditions unless they are accustomed to, or at least can tolerate, highly alkaline conditions.

(iii) *Water.* — The average rainfall of the Maltese Islands is approximately 60 cm annually. It is not, however, evenly distributed, and most of it generally occurs in short semi-torrential bursts during the Autumn and early Winter, so that an appreciable proportion is lost to Agriculture. The various sources used for artificial irrigation of cultivated trees and plants (i.e. reservoirs and wells, boreholes, etc.) are obviously not available to the " wild " indigenous flora, and dependence on the natural rainfall has therefore proved another limiting factor.

(iv) *Pests and diseases.* — The lack of trees has had its natural effects on the indigenous arboreal fauna, and there is no real evidence of any detriment to trees by and large through this source. There have been, over the years, endemic infestations of particular tree-damaging insects and diseases, but it is doubtful as to whether these could ever be termed limiting factors, except occasionnally, for one or two particular types of tree. One recorded instance was the gradual depletion of numbers of stone and pome fruit trees because of the activities of root and trunk boring insects, but the application of adequate control measures are now restoring conditions, at least in this respect, to normal. Again certain viruses and soil-borne fungi are a constant threat to several species of fruit and ornamental trees, but the effect loses most of its importance when compared to the more concrete factors such as water and soil.

(v) *Wind Conditions.* — The Maltese Islands are relatively windy, and the near-absence of sheltered localities means that trees are in a state of constant exposure to wind. As a result, indigenous trees tend to be confined to the several small valleys running through various parts of the Islands, and crop and ornamental species have to be either planted inside gardens bordered by high stone walls (from where they are invisible to the onlooker), or, if in " open " groves, have to be trained low, and a partial protectant in the form of a cane or prickly-pear windbreak erected. High regions can be seen to be absolutely bare of trees.

This lack of trees has been a constant problem, and particular attention has been directed towards it in recent years, principally because of the relatively acute efforts to (*a*) increase Agricultural Production, and (*b*) enhance the Islands' aesthetic value as a tourist resort. For the past ten years at least, the question as to how to increase the numbers of both crop and ornamental trees has been studied in detail.

The two questions of Education and Afforestation are intimately linked in this instance. From the purely technical angle, the afforestation, or perhaps one should say re-afforestation, of Malta and its sister Islands would, apart from enhancing the environment, provide economic benefits through increased fruit production and improve touristic and recreational facilities. It would also, and this is important, help in soil conservation and in preventing erosion by the stabilising action of the roots. From the educational angle, the implanting of a sense of aesthetic valves into the minds of the population would prove an answer to vandalism and ensure cooperation in environmental preservation. From the purely agricultural angle the two themes are also tightly linked, as one of the major factors in ensuring the well-being, survival, and yield of fruit trees is the standard of education of the farmer and grower, and his ability to preserve and enhance his stock.

Early attempts at afforestation in Malta were the reclamation of a rocky hill-region in the Northern part of the Island. Here, the terrain was typically variegated rock outcrops, some smooth, some rough, with very small isolated soil pockets. Several thousand young olive trees were planted here, after holes had been blasted in the rock and filled with soil. Here, the major problems immediately asserted themselves. The rainfall was soon found to be inadequate, and artificial irrigation during the spring and summer months was found to constitute a necessity. Wind-conditions were instrumental in producing a high degree of evaporation from the foliage, and the state of comparative dryness of the soil afforded excellent conditions for the activities of the clay-coloured weevil, *Otiorrhynchus cribricollis*, and allied species, which were responsible for a significant degree of defoliation through feeding. The pests were brought under control; so, to some degree, was the water problem, but winds are still considered a major obstacle.

Recently, the problem has been tackled more scientifically in a number of interlinked aspects. From the point of view of crop-bearing trees, studies on varieties suitable to local climatic conditions are being carried out, and their planting in various localities is now slowly ensuring (*a*) an increase in gross numbers, and (*b*) a widening of the period of harvest, to ensure local supplies over a longer interval. Again, care is being taken to select comparatively sheltered sites. Attention to pest and disease control is now ensuring that this particular factor does not ever reach significant proportions. Simultaneously, the provision of demonstrational facilities for farmers and growers, a good advisory service from both cultivation and pest-control aspect, and the initiation of training for farmers' sons have now improved considerably on the previous standard of education (at least from the technical aspect) if the farming community, most of which are illiterate or semi-illiterate. In addition, the introduction of compulsory education for all children several years ago is now bearing fruit in the agricultural sphere, as it is common nowadays for the farmer's children to help their parents, not so much perhaps, in the actual physical work in the field, but also in doing the " reading " work for the family.

Again, in crop-afforestation, the soil and water problems are being vigorously tackled. In the obvious impossibility of improving the gross condition of the soil, beyond slight modifications through fertiliser and mineral use, attention is being paid to the use of suitable varieties. Water is now being obtained by supplementing, as far as possible, natural rain by artificial irrigation, aiding the development and construction of reservoirs and wells, and, wherever possible, providing irrigation-water by bowser from Government holdings.

From the aesthetic viewpoints, again from the technical angle, two main themes are being followed: (*a*) the preservation of tree-growing regions —these are very small, few in number, and confined to naturally sheltered localities, and (*b*) planting of trees, mostly imported along roadsides, and in various other localities. Here again, particular attention is being paid, both to the planting locality itself, where a fair degree of natural shelter from prevailing winds is required, and to types of trees which require the minimum of artificial irrigation. The educational aspect is again being emphasised. School children and youth organisations are encouraged, both by their teachers and by special Committees set up for the purpose, to care for trees; and special ceremonial plantings are held frequently for this. Various personalities, foreigners resident in Malta, and Maltese emigrants now living in Australia, the U.S.A., and elsewhere, are encouraged to contribute towards the cost of one or more trees to be newly-planted by having a small plaque bearing their name affixed on the tree. Various foreign embassies are also contributing by donations of trees from their own countries. Most of these trees are imported in the young stage, and grown in Government Nurseries prior to planting at their final destination. Emphasis is also being placed, in the educational sphere, on the importance of preserving the national environment, on the possibilities of its embellishment, and of the part played by afforestation in such improvement.

It would, of course, be far too premature to consider the problem of tree-lack in Malta as solved, or even, perhaps to say that is it well along the road to final solution. There are major factors which have still got to be accepted and by-passed —others may very well raise their heads in the immediate or not-too-distant future. It can be said, however, that afforestation in Malta constitutes a problem particular to the region, and that efforts made so far have, to some degree, improved, and are continually improving the position. One positive factor which has emerged is that solutions to such problems can obviously only result after efforts of an inter-disciplinary nature, in which education plays a major part. In fact, much of the progress achieved in afforestation in Malta can be said to be an indirect (perhaps also in some cases direct) result of its intimate links with educational aspects.