

Drought: Problems of Acclimatization

by Piero Caneti

From *The Mediterranean Garden* No 19, Winter 2000

We all know that the periodic total absence of rain is one of the characteristics of the Mediterranean climate. Indigenous plants have adapted to this, modifying their organs through the ages to reduce transpiration, or the loss of moisture. This explains their appearance: thorns instead of leaves, smaller and harder leaves. However during the dry season trees and shrubs show, if not real suffering, at least a certain discomfort as their leaves lose their shine due to their suspended development while they await the September rains. Herbaceous plants, having in fact concentrated their production of flowers and fruit in the spring, die in the summer, thus entrusting their reproduction to their seeds, or they dry up completely, greening the land again only when conditions become less prohibitive.

It is easy to understand why the phenomenon of drought still preoccupies Mediterranean gardeners who must decide whether to face the problem as though it were a curse to be exorcised by the only means they know - water - or whether to adapt to the inevitability of things. The two approaches are diametrically opposed: the former is certainly the riskiest, in that it stems from the assumption that water, whether on the surface or under the ground, is an inexhaustible resource available in vast quantities, while the latter decries the dangers of uncontrolled use of a resource that is precious for humanity and calls for a change in growing techniques, ultimately bringing the aesthetics of the garden into line with the hard facts of life.

During the last ten years, the selection of one or other of these methods has lost the connotation of free choice, if ever that existed, acquiring a compulsory character, even if not everyone has become aware of this. The problem has now become a burning issue, since the climate changes currently taking place have led to the alternation of abundant rains with periods of drought which, in the Mediterranean climate zone, are compounded by the already existing aridity. According to scientists, the 'tropicalization' of the Mediterranean basin, due to the rise in the average temperature by several degrees, will bring about the desertification of vast areas in the south. In the spring and summer of 1998 we had a glimpse of what could happen. After an autumn with rains of normal intensity an equally rainy spring was expected, but instead the climatic conditions were abnormal. At our observation post located in the sub-littoral zone, the winter brought sporadic falls in temperature reaching -7°C but was basically mild, so that plants not only did not reduce their vegetative activity but in fact increased it due to the favorable levels of moisture in the soil. In cases like these, there is usually a sudden and precocious spring, but this did not happen because the consistent rains of April and May did not come. As is well known, the month of May is crucial for plants in the Mediterranean climate, since it is the month of the fastest growth in preparation for the hardships of summer. During May the water requirements of plants are at their greatest and if it does not rain now this not only means that there will be five dry months, but also that the vegetation will be unable to complete a most important part of its normal biological cycle to survive these months. Having recourse to an early input in water is no solution, because the soil would require an enormous water supply to recharge it in depth with the resources which have already been consumed by the precocious growth of the plants. In other words, even with the most sophisticated technology, it is not possible to compensate for lack of rain in the preceding months. Even if the physical structure of the land were to allow it to absorb large quantities of water in a short time, which is plausible only if the soils are naturally porous and deep, the daily presence of the sun would cause thermal imbalances and hence the proliferation of fungi and parasites that are deadly to plants.

It was therefore decided, in the acclimatization garden where these observations were being made, not to intervene even with emergency irrigation on all plants established there for at least four years, to avoid fertilizers and to maintain a substantial layer of mulch around each individual plant,

whether isolated or in groups. As has been said, the garden is located in the sub-littoral zone at an altitude of 400m on land of volcanic origin, in other words with a not very acid, soft, fresh and deep soil. In order to avoid burdening the experiment with obvious results, indigenous and naturalized plants were not taken into consideration, and neither were plants of the Mediterranean climate zone and the most common palms, known for their great resistance to drought. In this respect it should be remembered that in 1986 these withstood a period of continuous lack of rain lasting all of eighteen months!

We believe it to be of interest that we limited our test to two groups of plants with a single characteristic in common:

- plants coming from geographical areas with climates that are different from the Mediterranean climate;
- plants (even indigenous and coming from Mediterranean climate zones) that in the dry summer season assume a disappointing aspect from an ornamental point of view.

Drought-resistant plants coming from regions whose climate differs from that of the Mediterranean:

Climbers

Abutilon megapotamicum
Akebia quinata
Araujia sericifera
Campsis radicans
Clematis armandii
Clematis montana
Dregea sinensis
Macfadyena unguis-cati
Ipomaea indica
Jasminum nudiflorum
Parthenocissus
quinquaefolia
Parthenocissus tricuspidata
Passiflora caerulea
Solanum jasminoides
Trachelospermum
jasminoides
Wistaria (all)

Trees

Firmiana platanifolia
 syn. *F. simplex*

Shrubs

Abelia x grandiflora
Brugmansia suaveolens
Buddleja davidii nanhoensis
Caesalpinia gilliesii
Camellia japonica
Camellia sasanqua
Caryopteris x clandonensis

Shrubs

Chaenomeles japonica
Chimonanthus praecox
Colletia hystrix
Colletia paradoxa
Cordyline australis
Cotoneaster dammeri
Cytisus x praecox hybrids
Cytisus scoparius hybrids
Cytisus spachianus (*Genista*
x spachiana)
Echium candicans
Elaeagnus x ebbingei
Erythrina crista-galli
Eupatorium ligustrinum
 (*Ageratina ligustrina*)
Indigofera heterantha
Jasminum humile
Lantana camara
Lantana sellowiana
 (*L. montevidensis*)
Lonicera fragrantissima
Lonicera nitida
Mahonia aquifolium
Mahonia x media 'Charity'
Osmanthus x burkwoodii
Osmanthus delavayi
Osmanthus heterophyllus
Photinia x fraseri 'Red
 Robin'
Phyllostachys aurea
Phyllostachys mitis (*P. edulis*)

Shrubs

Pittosporum tobira
Prunus laurocerasus
Prunus laurocerasus 'Otto
 Luyken'
Rhaphiolepis indica
 'Springtime'
Rhaphiolepis umbellata
Sarcococca humilis
Spiraea cantoniensis
Yucca (all)