

## HARDENING PLANT MATERIALS FOR WINTER (CENTRAL)

W. C. COLLINS

*Cole Nursery Company, Painesville, Ohio*

Several factors are involved in hardening plants for winter. Some are directly related to cultural practices and can be partially controlled by the nurserymen. Others, for example, not so manageable, are inherent plant hardiness and major unseasonable weather conditions.

Two examples of important, *less controllable factors* are: (1) the relationship between the normal hardiness of a specific plant and the location in which it is being grown, and (2) those extended periods or severe changes of unseasonal weather that alter the seasonal maturing process.

Two examples of more or less *controllable factors* are these: (1) one is the deliberate plan to locate the nursery within a desired area possessing the largest number of stabilizing factors such as suitable soil type, air drainage and nearness to large bodies of water. (2) Another is the planned reduction or cessation of those cultural practices that encourage vigorous and rapid vegetative growth.

### **Relationship of 'Hardening' to Hardiness**

The degree of inherent hardiness or cold resistance varies with different species and varieties, and varies for the same species in different climatic areas. L. H. Bailey said, "In general, however, the unqualified word 'hardy' indicates that the plant is able to withstand the winter of a given place." It follows then that attaining the winter hardiness of a specific plant becomes increasingly difficult the farther it is grown from its so-called adaptable area. This selection of kinds to propagate is a factor each nurseryman can determine for the area in which he grows stock. The greater the distance a specific plant is grown from the area it is normally hardy, the greater the problem of hardening becomes.

### **Effect of Unseasonable Weather on Hardiness**

Another factor over which the nurseryman has little control is injury following unseasonal temperature changes. Unseasonal weather may occur during the normal 'hardening-up' period in late summer, fall and early winter or during early winter after the plant has achieved its normal cold resistance. An extended mild temperature period during the normal fall ripening season may so delay ripening that the plant has inadequate time to become properly ripened. Likewise, some plants which have become normally hardened may be injured because of an extended late season warm period with its usual drying effects.

Several years ago Southern Canada experienced such a winter. The following spring a number of horticultural authorities urged the public not to give up growing many choice, desirable plants just because of this particular unusual winter. It was reported that 70 per cent of the roses were killed in the Toronto area alone.

### **Choice of Nursery Location Important**

Certain nursery growing areas within the same temperature hardiness zone are more favorably located than others. For example, many nurseries are situated near or within a sizeable weather stabilizing area, such as the shore areas of the Great Lakes. To varying degrees, these areas are present in Wisconsin, Illinois, Indiana, Michigan and Ohio. These locations frequently overlap fruit growing areas, and they were originally selected because they permitted the economically important annual cropping of both bush and tree fruits. The problem of hardening nursery stock in these areas is less important.

While the above factors may seem somewhat irrelevant to the practical aspects of hardening plants for winter, they are important in such major decisions as the selection of nursery growing areas and the choice of plant material grown at a specific location.

### **Field Cultural Practices Affecting Hardening for Winter**

The cultural practices which nurserymen can use to induce winter hardiness are in many ways almost in direct contrast of the practices he uses to initiate and maintain maximum vegetative growth during the growing season. The following dates are based primarily on the field operations of The Cole Nursery Company at its Painesville, Ohio nursery.

*Cultivation:* Stop field cultivation not later than August 15th. The competition of late weed and grass growth aids in ripening the stock as well as reducing heaving of light stock.

*Fertilizing:* The fertilization of evergreens stopped about July 5th and that of deciduous stock by the 20th of July.

*Irrigation:* Irrigation of field stock curtailed after the 20-25th of August. This does not apply to broad-leaved evergreens which transpire all winter and which should be well watered as they enter the winter season.

*Pruning:* No pruning on deciduous stock done after August 20th. This permits time for adequate wound healing and reduces killback below the cuts. No trimming of evergreens after July 20th.

*Planting:* Good seedbed preparation coupled with early planting of stock helps to assure deep and profuse rooting and a longer period for growth and ripening. Site selection within the nursery can reduce hardening hazards. Plant late maturing kinds on high and well drained soils. Adequate tiling will help on less favorably drained soils.

*Pest Control:* While admitting the unquestioned value of a pest control program, the presence of healthy, vigorous foliage persisting on certain kinds of plants, sometimes until freeze-up, does not encourage the early maturing of stem tissue.

*Root Pruning:* Root pruning by undercutting during the growing season certainly hastens the maturing of the stock so treated, although the purpose may be to produce a more fibrous root system near the base of the plant and to assume greater transplanting suc-

cess the following seasons. It can be done in early spring or in August depending upon soil conditions.

### **Seed and Propagation Beds**

1. Fertilizing stopped by August 20th. Three pounds of Kapco in 100 gallons of water used about every 10 days.
2. Lath shades removed from the propagation beds on Labor Day — give or take a week according to the season.
3. Irrigation of the irrigated beds stopped about Labor Day unless dry weather prevails; then it is applied as needed.
4. Greenhouse mist propagated softwood cuttings hardened off before removal.
5. Mist on outdoor propagation beds shut off gradually when cuttings are rooted.

MODERATOR GALLE: Now we are going to the Midwest to Iowa, and Mr. George Rose will present that.

## **HARDENING PLANT MATERIALS FOR THE WINTER WITH SPECIAL REFERENCE TO MIDWEST CONDITIONS**

GEORGE ROSE

*Henry Field Seed and Nursery Company  
Shenandoah, Iowa*

Midwest winter conditions are very difficult on plant material, because of the frequent, very rapid changes in temperature and humidity. Many plants, which are hardier in much colder climates, often come to grief in midwest areas because of freeze damage to unripened tissues, caused by early freezes and by the usual lack of a snowblanket to keep the temperatures and humidity surrounding the plants from fluctuating widely.

### **Narrow-Leaf Evergreens**

My talk will not cover field grown narrow leaf evergreens, as we do not handle this material at the Henry Field Seed and Nursery Company.

We do not produce container evergreens grown in soil or the other common mixtures either, but the common winter preparation procedure with this material in our area is to pull the evergreens together in tight groups and mulch heavily around the edges of the groups with shingletow or hay. This is the way container evergreens are wintered at Plumfield Nurseries and they very seldom experience any winter damage. No particular hardening off procedures are practiced.

To produce material that is merchandisable for our mail order business, we have, over the years, developed a method of growing narrow-leaf evergreens in containers of light weight growing medium, composed of ground sphagnum moss to which about 10% peat is added. The peat is used to retain the slow release nitrogen fertilizers, either Uramite or Borden #38, which are added to the potting media