# SCHEDULING PLANT PROPAGATION

CARL ORNDORFF

*Kalmia Farms Nursery*
*Clarksville, Maryland 21029*

The scheduling presented here covers cutting propagation only. Our firm propagates by cutting many woody plants normally started by other methods, but these are in the minority. Our cutting program is operated on a 12 month schedule with our facilities at full capacity at all times.

To set up an effective schedule, detailed propagation information must be obtained for evaluation. This is normally the result of long continuing experience and study, as well as keen accurate observation. The following information is essential before considering the perparation of a propagation schedule:

1. *Determine the most efficient rooting period or periods and* the effective length of these periods. As an example, hybrid lilacs, *Syringa vulgaris* cultivars, may have only a 7 to 10 day effective cutting period in late May for softwood cuttings. *Euonymus* species and cultivars may be rooted all year.
2. Determine the required average rooting time. This is essential in calculating space and labor priorities. This may range from 3 weeks for such shrubs as *Abelia, Deutzia, Forsythia* and certain *Viburnums* to as long as 4 to 5 months for compact or dwarf *Chamaecyparis* cultivars.
3. Estimate the quantities of plant materials required.
4. Consider growing procedures and timing following rooting. This again includes such factors as space requirement priorities and labor priorities as well as growing facilities, storage facilities, available equipment and salvage labor. At several northern nurseries I have observed all softwood cutting operations being done in outdoor beds, while greenhouses used in the winter season stand totally empty. This would appear to be a waste of facilities and labor. Also cuttings of plants critical of rooting and, especially those critical of winter storage, may be handled better in enclosed facilities. Examples would be flowering cherries, deciduous magnolias, Japanese maple, Bradford pear, tree lilac, ginkgo and fragrant viburnum.
5. Consider effective alternate methods and alternate periods of propagation. This is the elasticity that smooths out the periods of overload and periods of reduced activity.

Since many additional plants are continually being converted to cutting propagation, it would seem well to explain some of the

principal reasons and advantages for such conversion.

1. Superior seedling cultivars may be selected and propagated by cuttings. As an example, we are growing superior *Ilex verticillata* with a predetermined high ratio of berried plants instead of seedling plants of unknown sex or fruiting abilities and usually of lesser quality. This does not mean seedling production should be totally abandoned, only that some species and cultivars may be propagated more efficiently and produce superior plants by cuttings.
2. Cutting propagation may also have advantages over budding by producing a superior root system. Bradford pear on its own root has a far superior root system, compared to when it is on *Pyrus calleryana* seedling understock. Pest problems may be reduced. The far lower susceptibility of own-rooted flowering cherries to peach yellows disease is an example.
3. Grafting methods often have problems alleviated by the use of cutting-grown plants. An example is the cultivars of *Syringa vulgaris*. Suckering understocks and compatibility problems like graft union galls are eliminated by using cuttings. While discussing lilacs, we may consider two alternate cutting methods. Use of softwood lilac cuttings is normally limited to an extremely short period in late May, with only a fair percentage of rooting, followed by a slow growth rate. Piece-root cuttings made in mid-winter and potted directly in soil mixtures, carried in a cool greenhouse, produce 100% rooting and large field plants in only one growing season.
4. Piece-root cuttings is an old but little used method and should have an increasing future with many decidious shrubs and trees. We are using this method totally with *Syringa vulgaris* cultivars, *Chaenomeles, Clethra, Aronia,* some *Viburnum* species and cultivars, plus experimentally with some crabapples and deciduous euonymus. Using this method has helped to reduce our heavy labor and space load from the heavy softwood cutting rooting period in summer to a slack mid-winter period.

After determining what are the best methods and timing for each species or cultivar, the procedure for assemblying the schedule may be as follows:

1. Select and remove from the information list those methods other than cuttings that may be more practical and thus prevent some crowding on the schedule.
2. Next, place on the schedule those having minimum effective periods of rooting and no efficient alternate times. An

**Table 1.** Condensed summary of the cutting propagation schedule.

| PLANT | MONTH | MONTH J | F | M | A | M | J | J | A | S | O | N | D | Rooting Time Weeks | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Deciduous Woody Shrubs | | | | | | | | | | | | | | | |
| *Aronia* | | xx | | | | | | | | | | | xx | 12-16 | Root cuttings |
| *Berberis* | | | | | | | x | xx | x | | | | | 5-6 | |
| *Chaenomeles* | | xx | | | | | | | | | | | xx | 10-12 | Root cuttings |
| *Clethra* | | xx | | | | | | | | | | | xx | 10-12 | Root cuttings |
| *Deutzia* | | | | | | | x | xx | | | | | | 3-5 | |
| *Euonymus* | | | | | | | | x | xx | xx | | | | 4-6 | |
| *Forsythia* | | | | | | | xx | xx | xx | | | | | 3-4 | |
| *Illex verticillata, I. serrata* | | | | | | | x | xx | | | | | | 4-6 | |
| *Philadelphus* | | | | | | | x | xx | x | | | | | 4-6 | |
| *Prunus gland.* | | | | | | x | xx | x | | | | | | 4-7 | |
| *Rhodotypos* | | | | | | | xx | xx | | | | | | 5-6 | |
| *Spiraea*, spring flowering | | | | | | x | xx | xx | | | | | | 4-6 | |
| *Spiraea*, summer flowering | | | | | | | x | xx | x | | | | | 5-7 | |
| *Syringa vulgaris*, hybrids | | xx | | | | | | | | | | | xx | 10-12 | Root cuttings |
| *Syringa*, all others | | | | | | | xx | xx | | | | | | 5-7 | |
| *Viburnum*, all fragrant | | | | | | x | xx | | | | | | | 4-8 | |
| *Viburnum*, all others | | | | | | | xx | xx | x | | | | | 3-8 | |
| *Weigela* | | | | | | | x | xx | | | | | | 4-6 | |
| Deciduous Trees | | | | | | | | | | | | | | | |
| *Acer palmatum* | | | | | | x | xx | | | | | | | 6-8 | |
| *Euonymus* | | | | | | | xx | xx | | | | | | 5-8 | |
| *Magnolia kobus, M. soul.* | | | | | | x | xx | | | | | | | 4-6 | |
| *M. stellata, M. liliflora* | | | | | | | xx | x | | | | | | 4-6 | |
| *Prunus sargentii, P. serrulata, P. subhirtella, P. yedoensis* | | | | | | x | xx | x | | | | | | 4-6 | |
| *Pyrus calleryana.* 'Bradford' | | | | | | | xx | | | | | | | 4-7 | |
| *Syringa amurensis* | | | | | | x | xx | | | | | | | 5-7 | |
| *Tilia cordata* | | | | | | | xx | | | | | | | 5-7 | |
| *Viburnum prunifolium, V. sieboldi* | | | | | | | xx | | | | | | | 6-8 | |

**Table 1** (cont.)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Broadleaf Evergreens | | | | | | | | | | | | |
| *Abelia* | | | | | x | xx | xx | xx | | | 4-6 | |
| *Berberis* | | | | | | | xx | xx | xx | | 5-7 | |
| Buxus sempervirens, 'Suffruticosa' | | | | | | xx | xx | | | | 5-8 | |
| *Buxus*, all other | | | | | | | xx | xx | xx | | 5-8 | |
| *Cotoneaster* | | | | | | xx | xx | xx | xx | | 4-6 | |
| *Eleagnus* | | | | | | | xx | xx | xx | | 5-7 | |
| *Euonymus fortunei* | xx | xx | xx | | | xx | xx | xx | xx | xx | 3-4 | |
| *Euonymus sieboldiana* | | | | | xx | xx | xx | xx | xx | xx | 3-4 | |
| *Ilex crenata, I. glabra* | | | | | | x | xx | xx | x | | 5-8 | |
| *I. fosteri, I. opaca* | | | | | | | x | xx | xx | | 8-10 | |
| *Mahonia* | | | | | | | | x | xx | | 6-8 | Frost essential |
| *Pyracantha* | | | | | | | xx | xx | xx | | 4-6 | |
| *Sarcococca hookeriana* var. *humilis* | | | | | | | xx | xx | xx | xx | 6-8 | |
| *Stranvaesia davidiana* var. *undulata* | | | | | | | xx | xx | xx | | 6-8 | |
| *Viburnum rhytidophyllum* | | | | | | | xx | xx | xx | | 5-7 | |
| *Yucca* | xx | | | | | | | | xx | xx | 10-14 | Root cuttings |
| Coniferous Evergreens | | | | | | | | | | | | |
| *Chamaecyparis nootkatensis* | | | | | | | | xx | xx | xx | 8-12 | |
| *Ch. obtusa* | | | | | | | | x | xx | xx | 10-20 | |
| *Cryptomeria japonica* | | | xx | | | | | | | | 8-10 | |
| *Juniperus chinensis*, upright | | | | | | | | | xx | xx | 10-12 | |
| *J. ch.*, spreading | xx | | | | | | | | xx | xx | 10-14 | |
| *Juniperus ch.* var. *sargentii* | xx | xx | | | | | | | xx | xx | 8-10 | |
| J. horizontalis | xx | xx | | | | | | xx | xx | xx | 8-10 | |
| *J. virginiana* | | | | | | | | xx | xx | xx | 8-14 | |
| *Taxus baccata* | | | | | | | | xx | xx | xx | 10-14 | |
| *T. cuspidata, T. x media* | xx | | | | | | | xx | xx | xx | 10-14 | |
| *Thuja occidentalis*, upright | xx | xx | | | | | | | xx | xx | 8-12 | |
| *Thuja oc.* 'Unbraculifera', 'Woodwardi' | xx | xx | xx | | | | | | | xx | 6-10 | |
| *Tsuga canadensis* | xx | xx | | | | | | | | xx | 10-12 | |

excellent example is *Cryptomeria japonica*. This evergreen and its cultivars give quick, near 100% heavy rooting if made in early March. Another example is *Mahonia*, also near 100% with heavier roots, if taken immediately after the first heavy frost or light freeze. *Sarcococca hookeriana* var. *humilis* taken in July or August will take until December to root while those taken in October or early November root better by about the same date.

3. Select those with less critical periods or with alternate periods. Work into the schedule the best periods that are still available. This covers 60 to 70% of our production and should be about the same with most nurseries growing a mixed general line.
4. Fill in the balance of the vacancies with plants not having a critical time of rooting. These we refer to as our filler crops, which does not mean they are less important or less profitable. Such crops could be *Cotoneaster*, *Euonymus*, *Juniperus horizontalis* cultivars, most evergreen covers, and many others.

In summary, the key to scheduling production of the nursery stock is first determining the best methods and best timing for each species and cultivar. Making the schedule is putting these pieces of information together as in a simple puzzle. Once you have all of the pertinent information before you, it falls into place easily and quickly.

I am well aware that few could use our schedule as submitted in a 1 page summary (Table 1) or in the detailed 10 page work copy we have in use at this time. Nor could you use the schedule of other producers of plant materials. Each will likely produce different materials in different quantities under different physical facilities, working under unsimilar climatic conditions.

The real purpose of this discussion is to have you take a long hard look at your production schedule and evaluate the possibility of profitable changes that are certain to come with the increasing knowledge available and with changing demands on our industry for different types and quanitites of products, plus the demands of a fast changing economy.

MODERATOR FLEMER: Thank you, Carl. I'm sure it is evident to all of you why they call Carl a master propagator in the mid-Atlantic area. Our next speaker is Jeremy Wells who is going to tell us about the use of fungicides in rooting compounds.