

HORMONE CONCENTRATIONS

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Hormone¹ concentration is an important consideration when propagating from softwood cuttings. Too little used can be ineffective and too much can cause injury or death of the cuttings. Different species of plants, of course, require differing amounts of hormone to best aid in the rooting process. For example, *Euonymus* cultivars require no added hormone to achieve fast and abundant rooting of softwood cuttings. *Taxus* cuttings, on the other hand, are greatly aided in their rooting by the use of hormones. The hormone helps to speed rooting and increases the number of roots. It also will increase the uniformity of rooting and the quality of the roots produced per cutting (1).

It should be recognized that the use of hormones does not replace good propagating practices in other areas. Hormones are just one of the many tools the plant propagator has at his disposal. If used effectively, they can be of great benefit, but if misused they can cause additional problems (1).

The most common root promoting chemicals used in the trade are indolebutyric acid (IBA) and naphthaleneacetic acid (NAA). There are others, such as indoleacetic acid (IAA), which are less commonly used but are also effective. IBA is the most widely used among the root-promoting chemicals because it is nontoxic over a wide range of concentrations (1). It is also effective in promoting roots on a wide variety of plant species. IBA is the most widely used in commercial preparations, which consist of the chemical dispersed in powder, usually talc. The pure chemicals are also available from chemical manufacturers so a propagator can mix his own concentration which I chose to do for certain types of plants.

I feel that a vigorous plant must start with a cutting which is healthy and produces as many roots as possible. If the rooted cutting is vigorous, chances are the mature plant will be vigorous when lined out in the field or put into a container. It will show better growth during the growing season and, because it started with a well-defined root system, it will have a better start when planted.

Using the right hormone concentration is thus very important in the final outcome of plant growth and development. As an example, I will use two plants: *Taxus* species and *Viburnum rhytidophylloides* - (syn. *V. lantanophyllum*). These species of

¹ Root-promoting auxin-type growth regulators.

plants are not extremely difficult to root but I am using them to dramatize how hormones effect plant rooting and development.

It should be noted, at this point, that other conditions such as sanitation, moisture, etc. will also have an effect on the vigor of the rooted cutting. The viburnum cuttings were rooted under outdoor mist during the summer months. The taxus cuttings were rooted in cold frames over-winter without the aid of bottom heat. Insects and diseases were controlled as needed. The hormone used was NAA.

At this point, I want to interject another factor; that of economics. Today, more than ever, economics is part of almost every decision a propagator and nurseryman makes. This is true of all forms of propagation. So when considering a hormone for use on a specific plant, economics plays an important part. Thus the use of NAA as opposed to the more expensive IBA for rooting the cuttings mentioned.

The quick-dip method is used on most cuttings that require added hormone to aid in rooting. The pure crystals of the hormone being used are dissolved in denatured alcohol usually at a concentration greater than 2,000 ppm. The base of the cutting are dipped for approximately 10 sec. before inserting them in the rooting medium.

I have found that I get good rooting on most shrubs and evergreens in the nursery with hormone concentrations of from 2,000 to 4,000 ppm. For both *Taxus* and *Viburnum rhytidophyloides* cuttings a 2,000 ppm solution was used of NAA. Cuttings of both plants, however, produced very similar amounts of roots and both were vigorous growers when plants in the field. The root system was more than adequate in both cases so the plant was more vigorous from the start.

In summary, I would like to stress the importance of proper use of plant hormones so that a good healthy root system is produced at minimum cost to the grower. Find the hormone concentration that gives the best result with the specific plant. I personally feel that the quick-dip method is superior to the powders; however this may not be true for everyone.

LITERATURE CITED

1. Hartmann, Hudson T. and Dale E. Kester. 1968. *Plant Propagation: Principles and Practices*. Second Ed., Prentice-Hall, Inc. Englewood Cliffs, N.J.

CHARLIE PARKERSON: Thank you, Dave. Our next speaker is Dr. Bert Swanson from Colorado and he is going to tell us about his results in using Ethrel as an aid to rooting.