



## Root Stimulants and Transplanting Tips

**Learn more about the root stimulants that may help your trees and shrubs survive the transplanting process.**

By Rick Gush

### Transplanting Nursery Stock

Remember these critical steps when transplanting nursery stock.

#### The \$100 hole

For nursery stock, the key to good plant growth is digging a good hole.

An old landscaper's adage is, "Dig a \$100 hole for a \$10 plant."

A \$100 hole is large, irregular, backfilled with enriched soil and includes a covering mulch.

A \$100 hole is not a uniform bowl shape, but instead is irregular in shape and includes several small tunnels that lead away from the main body. The irregularity encourages greater interaction between the planting mixture and the native soil.

### Coddle Bedding Plants

Yanking plants by the stem out of the plastic six-pack they came in is a bad idea, even for older, overgrown specimens.

It's much better to push up the bottom of the plant with a finger, until the root ball can be grasped.

When there are roots growing out of the container, these must be pinched off without pulling the protruding roots, as any pulling can damage roots further up within the root ball.

### Root Pruning

Girdling roots are sometimes a problem in container-grown stock, and it's not a bad idea to prune away any roots that seem to be circling or growing around the base of the trunk.

Roots may also be circling the bottom of the root ball; these should also be cut away.

The best idea is to select nursery stock that doesn't appear to be overgrown or have roots growing out of the bottom of the container.

Again, cutting is much preferred to trying to yank the roots away by hand, as the yanking can injure other roots inside the root ball.

TopMany debate the effectiveness of root stimulants in transplanting situations.

Vast numbers of gardeners and horticulturists enthusiastically choose to use one or more of the "rooting stimulants" available for purchase.

Still, university research and cooperative extension literature usually contain statements such as, "There is no apparent benefit from adding vitamin B1, root stimulants, plant tonics or mycorrhizae at planting."

The following explains some of the available stimulants.

### Auxins and Plant Hormones

Most root stimulants contain some form of plant hormones--important chemical agents that direct and encourage growth within the plant body.



Among rooting stimulants, the most important plant hormones are the class named auxins.

Auxins are produced naturally in plants, the most common being indoleacetic acid (IAA), which acts as a growth regulator by promoting cell elongation and altering cell wall plasticity. IAA is also the chemical produced by terminal buds that inhibits growth further down the branch and produces the phenomenon of apical dominance (the main, central stem of the plant is dominant over other side stems).

Some synthetic auxins are marketed commercially as weed killers, the best known of which are: 2, 4-D (2, 4-dichlorophenoxyacetic acid) (contains no dioxin) The defoliant Agent Orange (known carcinogen)

These mass doses of auxins cause the plants to produce excess ethylene, which kills the plant by inhibiting cell elongation and causing leaf drop.

Because grasses are much less susceptible to auxin overdose, synthetic auxin herbicides often are used to kill broad-leaved weeds in lawns.

Top

#### IBA and NAA

Application of auxins to cut stems encourages root production. Almost all rooted cuttings produced in the horticultural industry are produced with the assistance of auxin compounds, usually in the form of a powder in which the cut stems are dipped.

#### Call Before You Dig

Follow these tips before you dig a hole for your tree: To avoid mistakenly slicing a phone, gas or power line, transplanters must arrange for local utility companies to mark the location of known underground pipes near the digging location and in the new planting area. The national Call Before You Dig (CBYD) network provides this service.

It's against the law not to call. Although the laws vary between states, all states have statutes that require anyone operating mechanized digging equipment to notify the local CBYD and allow them to finish their marking process before starting to dig.

Even after the CBYD process, if underground utility lines are disturbed by hand digging, or even touched by mechanical equipment, the local utility involved should be notified immediately.

The area around all gas lines must be hand dug; using mechanized equipment is always prohibited except for gas company workers.

Top

Because IAA is not water-soluble, it's difficult to handle from a manufacturing point of view. As a result, other synthetic auxins were produced for horticultural use. The most common of these are: indolebutyric acid (IBA) naphthalacetic acid (NAA)

Research now shows that these auxins are also produced naturally in some plants.

IBA and NAA are the active ingredients most commonly included in root-stimulant formulas.

Due to their synthetic nature, IBA and NAA are not approved for use in certified organic crop production. However, many gardeners and farmers--who lean organic, but choose not to be certified--use IBA and NAA, believing that these chemicals do not negatively affect the quality of their produce.

Top

#### Gibberellic Acid

Gibberellic acids are another class of plant hormones commonly found in plant tonics and root stimulators.



## Root Basics

Understanding the importance of feeder roots and their location is critical to your transplanting success.

## Crown Roots

A root ball that takes only the crown roots will have little chance of success, as there are very few feeder roots in this area.

## Support Roots

While there are some feeder roots in the zone of the support roots, a root ball with only support roots will be slow to reestablish growth.

## Feeder Roots

The feeder roots are the active water and nutrition absorbers, but they are very weak physically and break easily when the surrounding dirt mass shifts.

## Taproots

Taproots are most commonly found on wild trees and shrubs, particularly conifers and nut trees.

## Net Roots

Cultivated trees and shrubs usually develop a network of roots, but the form of the root network does not always mimic the upper shape of the plant.

## Flat Roots

Trees and plants grown where the native soil is very hard will often develop considerably flattened root networks.

## Top

The chemicals in the gibberellin complex are noted for encouraging stem growth and seed germination; because the belief that stem growth itself promotes root growth, these chemicals often are included in the mixtures intended as root stimulators.

## Vitamin B1

An additional growth-control chemical produced by plants is thiamine, also known as vitamin B1.

This same chemical is also produced in human bodies and often used in vitamin therapies.

In plants, vitamin B1 is produced in leaves and migrates down to the root zone, where it encourages root growth. Most commercially sold, horticultural vitamin B1 products are actually a mix that also commonly includes IBA, as well as NAA or gibberellins.

## SuperThrive and Rootone

Numerous retail garden centers sell their own brands of vitamin B1 products.

Apart from these local brands, the two best-known national brand root stimulants are SuperThrive and Rootone.

Super Thrive contains NAA and is the rooting stimulant used by most professional, wild, live plant collectors.

Collecting wild plants, often for bonsai purposes, is a difficult activity, as wild plants often have long taproots that cause the plants to die when they're severed in the digging process. Soaking plants in SuperThrive solutions seems to render some plants less delicate in this regard.

SuperThrive is also frequently used by bedding plant and container stock growers, and is commonly added to the fertilizer mix.



Rootone, which contains NAA, is sold as a powder, and is most often used to dip cutting stems before inserting them into the rooting bed.

Other brands and generic rooting powders are also available, but Rootone has a huge share of the market. Transplanters will sometimes dust the root ball of a particularly expensive transplant specimen with Rootone.

Top

#### Seaweed

Seaweed is listed as an ingredient in a number of specialty fertilizers.

Hydrolyzed seaweed contains a wide range of micronutrients as well as plant-growth chemicals and hormones like auxins and gibberellins.

Many commercially sold, horticultural seaweed products include other potentially beneficial organic compounds. Many root stimulants and plant-growth tonics add seaweed extracts to their mixes.

#### Mycorrhizae

Although mycorrhizae are abundant in natural soil and root systems, some nursery practices may result in lower mycorrhizal levels in container-grown stock.

A number of companies offer packaged mycorrhizae in the form of spores, hyphal fragments or infected root fragments, of which the hyphal segments--basically chopped fungal stem pieces--seem to be the most widely effective.

Some root stimulant manufacturers have now started adding mycorrhizal materials to their mixes.

#### About Nitrogenous Fertilizers

Aside from the efficacy of Rootone and other rooting powders in encouraging root production in stem cuttings, the scientific community remains officially skeptical about the efficacy of using root stimulants like vitamin B1 in transplanting projects.

They say instead that it's the presence of nitrogen fertilizer elements in root balls and backfill soil that most dramatically improves transplant performance.

Many vitamin B1 and other root stimulants now include small amounts of nitrogen in their mixes.

#### Willow Water

One delightfully pragmatic rooting stimulant is homemade willow water.

Operating on the theory that because willow branches root so easily when stuck in soil, some gardeners soak cut willow branches in water, and use that water as a root stimulant for all their vegetable sets and other transplants, including large trees.

Poplars, yuccas, dogwoods and other quick-rooting species are also employed in this manner.

Top

About the Author: Rick Gush is a regular Hobby Farms and Hobby Farm Home contributor, freelance writer and small farmer from California, now living in Italy.