

## Whats in your trench? A deep dig into vine burying technique.

By Joe Ailts, June 2014

By virtue of their stems growing horizontally, giant pumpkin plants exhibit the unique feature of root formation at their leaf nodes. Formally called “adventitious roots”, this system facilitates water & nutrient transport as well as anchoring the plant to the ground. Giant pumpkin growers have recognized this and incorporated techniques to encourage adventitious root growth for decades. The practice of vine burying is commonly recognized as an essential tactic for competitive success. At its core, vine burying hypothetically contributes to a simple path of logic: more roots=more water/nutrients=bigger pumpkins. Beyond this big picture idea, however, growers are fine tuning vine burying tactics to maximize root development, enhance anchoring, and minimize disease risk. This article will explore some of the ideas used to supercharge the adventitious root system.



*An adventitious root forms at each leaf node*

As with many practices employed in giant pumpkin patches, there’s no “right way” to execute vine burial/adventitious root encouragement. What you will read below are tactics employed based on intuition and creativity. Unfortunately, the grower’s community at large does not know if these techniques directly contribute to greater success in the patch, but it can be reasonably concluded that they do not lead to any significant disadvantage. Thus, if there is potential to contribute to greater success based on logic and intuition, and little risk is associated with the practices, then one may choose to employ these techniques.

In its most simple form, vine burying entails covering each leaf node with soil, providing the adventitious roots with an environment where they can grow and prosper. In the absence of vine burying,

adventitious roots will form, however there's no guarantee that root will reach the soil surface and continue proliferating, this especially true if dry conditions prevail where the developing root tip desiccates before reaching the soil surface.

To ensure a more favorable rooting environment, many growers dig a shallow trench in which each vine grows along. Soil is then piled on top of the vine and leaf nodes, effectively filling in the trench. In many patches, only leaves and leaf stalks may be visible above ground.



*Properly buried vines result in only leaves and leaf stalks visible above ground*

Within this practice of vine burial exists the opportunity for creativity and fine-tuning. In our effort to maximize every patch variable, with the intent to maximize every potential pound on the scale, growers have employed tactics that go well beyond the simple act of piling dirt over the vine.

Two strategies emerge as means to enhance the local environment for adventitious roots. The first pertains to the media used to cover the vines, the second to the application of additives directly to the leaf node/root zone.

In regards to the media used to cover the vines, numerous combinations exist. The most basic option is to simply use garden soil in close proximity to the plant. The soil removed when creating the trench can be reapplied over the top of the growing vine. Additional vine burying considerations include aged manures, compost, worm castings, and even enriched potting mixes. Some or all of these can be mixed in pre-formed piles or in wheelbarrows and then applied to the vines. The underlying premise is that these media types contain nutrients and/or other elements that confer a benefit to the plant greater than what the native soil can. Water percolating through these enriched mediums may deliver a more fertile nutrient mix to the developing adventitious root system. Soil additives (discussed in more detail later) can be incorporated into media mixes and applied in the vine burying process. For illustration purposes, the following recipe may be considered: in a wheelbarrow, mix 2 parts garden soil, 1 part enriched potting mix, 1 part worm castings. Mix well and apply with a shovel, coffee can, etc. Again,

there's no right or wrong combination here. Any benefit realized is ultimately a function of your soil fertility and a host of other considerations.

The second strategy used to fine tune vine burying is the application of a "trench mix". This entails applying a dry powder mixture directly to the leaf node before it is buried. The premise is based on localized delivery of nutrients and other agents to enhance adventitious root growth and plant health. Perhaps the most common example of trench mix application is the use of a granular mycorrhizal fungi (GMF) product. Top competitive growers have, for a decade or more, added ~1 tbs of GMF to each leaf node prior to burying. While the evidence is not yet conclusive, the conventional belief is that this practice increases the colonization of the beneficial fungi to the adventitious root beyond what soil provides. While GMF is likely the most common trench mix additive, below is a list of other agents that can be added to trench mixes:

- Powdered/granular Biologicals (beneficial microorganisms)
  - Trichoderma (e.g. Rootshield biological fungicide)
  - Streptomyces (e.g. Actinovate biological fungicide)
  - Azosporillum (e.g. Azos nitrogen fixing bacteria)
- Powdered/granular soil conditioners
  - Humic acid
  - Gypsum
- Powdered/granular plant nutrients & growth factors
  - N-P-K fertilizer combinations
  - Timed release plant nutrient products (e.g. Osmocote)
  - Fish/seaweed powder

Trench mixes can be pre-mixed and stored with some caveats. Biological products should not be premixed, as humidity, moisture, and combining with other biologicals may decrease their activity. Ideally, biologicals should be stored in refrigerator/freezer until used. Soil conditioners and plant nutrients can be pre-mixed and stored for ease of use.



*A trench mix of beneficial microorganisms, soil conditioners, and plant nutrients are applied directly to the leaf node before being buried*

It is again important to emphasize that there's no ideal combination of trench mix for all patches. And further, there's no conclusive evidence that any of these agents will provide direct benefit when applied to leaf nodes. Soil fertility, disease conditions, and many other factors dictate the infinitely complex soil environment. However, if you have a known disease presence or nutrient deficiency, designing a trench mix to address those issues is something to consider. How much to apply is also a major variable. A teaspoon, a tablespoon, a shovel full? No one knows. The point is to illuminate options at your disposal and then use the suggestions to determine what is right for your patch.

In summary, vine burying is a foundational patch tactic for enhancing patch success. Because giant pumpkin plants form adventitious roots at each leaf node, growers can capitalize on this opportunity to locally deliver a wide spectrum of beneficial microorganisms, soil conditioners, and plant nutrients to the developing root system. Have a question on this topic? Head over to the forums here on [BigPumpkins.com](http://BigPumpkins.com) and post it to the message board. And if you haven't already, join your local giant pumpkin club and visit a competitive patch to see these techniques in action. Good Luck!

-Joe Ailts



*A healthy adventitious root system significantly contributes to patch success*