



Pumpkin Roots & Icebergs...What's the Connection? -Joe Ailts, 2015

Scientists have determined that ice is roughly 90% as dense as water, and as such, 90% of the mass/volume of an iceberg is submerged. Sailors over the ages, most notably the crew of the *Titanic*, have recognized that when it comes to icebergs, what you see is only a fraction of what you get. So what does iceberg density have to do with our beloved hobby of growing giant pumpkins? The iceberg scenario serves as a cool (no pun intended) metaphor for comparing the root systems of pumpkins to the above ground vegetative growth.

Pumpkins grow a central taproot, however primarily display a “fibrous” rooting structure. The degree to which seedlings emphasize root development in the early stages of growth may be underappreciated due to the fact that most of this activity takes place underground and detached from our observational capabilities. Further investigation reveals some striking features of the just how “iceberg-like” the giant pumpkin root system is.



A pumpkin seedling was germinated in a 3” pot on a growing mat at 75 degrees F in traditional seed starting mix with no additives. At seven days, the seedling was removed from the pot and an investigation was undertaken to quantify root system development. As the picture below shows, the seedling had not yet reached the stage where the cotyledons had unfurled. The height of the above-ground vegetation was 2.5”. 35 lateral roots were harvested from the central 2.5” taproot. **Total root length of the taproot and lateral roots summed 78.25”, which converts to 6.5’ For emphasis, six-and-a-half-feet!** As a function of length, roots account for more than 97% of the plant at 7 days. This crude measurement fails to take into consideration the incredible collective length of microscopic root hairs (visible as branches on the lateral roots in photo below). It is these tiny root hairs that are the plant’s vacuums for water and nutrients essential for growth.



A word of caution here, if these root hairs are damaged, as can easily happen during transplanting and weed tilling, they do not grow back. Thus, it is important to handle transplants with utmost delicacy and minimize root

system disturbance throughout the growing season. In summary, it is impossible to know how extensive the root system becomes throughout the season, but we can be assured that just like the iceberg, what you see above is only a fraction of what exists below. Happy Growing!