**Root anatomy and root rots in Pennsylvania hybrid corn**

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Farmers in the Northeastern United States would benefit from corn cultivars with better roots that have optimized water and nutrient uptake efficiency without being compromised for root rot resistance. This can be achieved by selecting plants with specific root traits that allow them to grow deeper in the soil at a low metabolic cost, and low incidence of root rots. Studies in the Root Lab at Penn State University have demonstrated that a root trait that promotes plant growth, producing deeper roots, and higher yields, especially under drought and nitrogen stress is the enhanced production of air spaces in the root cortex, or root cortical aerenchyma (RCA). Variation for RCA has been studied in research lines of corn, mainly inbred genotypes developed for genetic studies; its variation in commercial U.S. hybrid lines remains unexplored. Furthermore, the tradeoffs of RCA for microbial relationships in corn has not been studied. We have hypothesized that changes in the microenvironment due to RCA could modify the percent of root rot percent as the habitat for fungal pathogens in the cortex is affected when plants have more RCA. Therefore, the objective of this research is to study variation for RCA, root rots and the correlation between these two variables in commercial hybrid lines planted in Pennsylvania at three sites in Centre and Blair Counties. We used 30-40 hybrid lines from 12 seed companies included in the ‘2014 Grain and Silage Hybrid Corn Test Program’ to collect root samples. Samples were laser ablated and the images of root cross-sections analyzed with the software *RootScan* to determine RCA. A scale of root rots was established to measure rots in roots collected at the third and second whorls of the nodal root system. Preliminary results show significant variation in RCA in hybrids planted in PA, with values ranging 0 – 40 %, similar to previous findings in inbred corn genotypes; this variation is independent of the company which produces the seeds. Site had a significant effect on RCA, although the relative differences between lines was stable. Regarding root rots, significant variation was observed in root rot percent in the evaluated lines, with values ranging 0 – 90% in the oldest nodal roots. Root rots significantly differed between sites and seed companies. The results demonstrate that RCA has potential as a possible target for corn breeding programs as current hybrids present variation. Correlation studies between root rots and RCA would provide more insights about the possible tradeoffs of RCA as plant breeding target.