**Microbial tradeoffs of root cortical aerenchyma in maize: mycorrhizal colonization and root pathogens in the field**

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**Root cortical aerenchyma (RCA)** improves the acquisition of water and nutrients by reducing the metabolic costs of soil exploration. While the overall results so far indicate a great potential of RCA as a plant breeding target, the microbial tradeoffs of increased RCA formation need to be considered in the context of sustainable agriculture. The general objective of this research is to study the effects of RCA on the belowground microbial relations of maize. Here, analyses of the effects of RCA on the **arbuscular mycorrhizal colonization (AMC)** and the **root rot (RR)** percent of field-grown maize are presented. Three field studies with up to 40 maize lines grown under optimal fertilization regimes were used to analyze variation of RCA and to select lines with contrasting levels of RCA. Lines with the most extreme RCA values were selected to measure AMC. A similar experimental approach was used to study the effect of RCA on RR percent, although RR was measured in complete sets of lines at root sampling, regardless of their RCA levels. Natural genotypic variation in RCA in inbred and commercial hybrid lines was consistent with previous reports, with values ranging from 0-40%. Variation in AMC and RR was 0-70% and 0-90% respectively. No significant correlation has been found between RCA and either ACM or RR. This indicates that RCA could be used as a plant breeding target for more efficient root systems in corn, without compromising AMC and RR. Further data analysis has, however, identified other root anatomical phenotypes as better predictors of AMC and RR in maize: cell cortical area, number of cortical cell files, and percent cross-section area occupied by xylem vessels.