

EFFECT OF ROOT CHARACTERISTICS ON P UPTAKE BY CORN

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Phosphorus (P) is an immobile macronutrient essential for plant growth. Phosphorus moves an average of ¼ inch in a growing season, making P-stress a concern even in soils with adequate P content. In cold temperature P is less mobile than in warm weather, increasing P stress experienced by plants early in the growing season. Root architecture plays an important role in a plant's ability to explore the soil and access P. Shallow roots allow the plant to explore the area of the soil where most P is found and fibrous roots allow the plant to explore a greater area of the soil. To better understand the genetics involved in root characteristics of importance in efficient P uptake, we are studying a population derived from NY821, a P-efficient corn inbred, and H99, a P-inefficient corn inbred. Performance in the field, phosphorus concentration in adult plants and seedling root architecture are being examined to evaluate the relationship between root architecture and P efficiency. This information will be integrated into a genetic map of the population in order to make a connection between the root characteristics and genetics of the plants. This research will help understand the genetic controls of root characteristics that are important for P efficiency and will provide breeders with information useful in creating P efficient corn plants.

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