

IMPROVING NITROGEN USE EFFICIENCY (NUE) IN CORN HYBRIDS

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Nitrogen use efficiency can be defined as the ratio of grain yield to total nitrogen taken up by the plant. Worldwide NUE for cereal crops is around 33% (Raun and Johnson, 1999), creating an opportunity for improvement. The remainder is unavailable for crop yield and subject to loss from the system. Better utilization of applied and mineralized nitrogen will help address water quality issues while providing greater yield potential. Variation within corn germplasm currently exists for NUE, creating a challenge to release untapped potential in new hybrids. Advances in plant breeding and functional genomics have made it possible to understand how genes may work to enhance nitrogen utilization in corn to improve yield performance. Areas for potential NUE improvement include sensing, uptake, assimilation transport, metabolism and remobilization while maintaining the carbon/nitrogen balance to improve kernel retention and growth. Transgenic products with the potential to improve nitrogen uptake and utilization in corn hybrids are in the early stages of development. Lead events provide more yield per unit input at standard rates of nitrogen fertilization in field trials.

References

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