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NITROGEN DOESN'T DO WELL ON ITS OWN

Nitrogen (N) is a plant nutrient that is essential for higher yields and for increased farmer profits, but if other nutritional needs of the crop are unmet, its benefits are reduced. Consequently, farmers and their advisers must ensure crops are getting complete nutrition to make the most of their nitrogen applications.

Cereal crops like rice, wheat, and corn get the nitrogen they need from either the supply in the soil or from other sources like fertilizer and manure. When the nitrogen supply in the soil is insufficient, these crops will produce a fraction of what they could yield if supplied with enough.

How much will yield increase for each pound of nitrogen applied? It depends. Examples are shown in column two in the table below. They range from 0.09 bushels of sorghum grain per pound of nitrogen to 0.36 bushels of corn grain per pound of nitrogen.

Increase in agronomic efficiency of nitrogen for several cereal crops when phosphorus and potassium were applied.

Crop	Yield increase per pound of applied N		
	N alone	N plus P and K	Increase from the additional P and K
	(bushels of grain per pound of applied N)		(%)
Rice (wet season)	0.31	0.60	93
Rice (summer)	0.24	1.8	636
Wheat	0.18	0.33	82
Corn (maize)	0.36	0.70	95
Sorghum	0.09	0.22	140

Ladha, J.K. et al. 2003. *Adv. Agron.* 87:85-156. Abbreviations: bu = bushel, N = nitrogen, P = phosphorus, K = potassium.

What is striking about this table is what happens to yields when other needed nutrients are also applied. Looking at columns three and four show that yield increases were magnified by applying phosphorus (P) and potassium (K). For example, applying P and K produced almost twice as much corn grain per pound of N compared to adding N by itself.

While individual results will vary, there is a basic principle here. When other nutritional needs are met, plants use nitrogen more efficiently.

Complete nutrition does not mean applying every nutrient. Soils can supply all or just some of what is needed. Soil and tissue testing help assess the level of fertility in the soil and provide useful guidance on whether or not to apply other nutrients. The key is to keep in mind that plants need more than just nitrogen. Making sure that each crop is getting all the nutrients it needs makes the most efficient use of each nutrient that must be applied.

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