

Table 3. Potassium use efficiency parameters for wheat in different sites/years.

Province	RE, %			AE, kg/kg K ₂ O			PFP, kg/kg K ₂ O		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
Hebei	47	35	47	10.2	5.5	9.9	77	60	94
Shandong	42	38	52	11.0	9.4	4.2	52	134	77
Shanxi	41	35	27	5.7	3.2	11.1	45	66	61

make K application profitable.

K Use Efficiency

Nutrient use efficiency can be expressed by crop RE, AE, and PFP (Fixen, 2007). AE refers to the crop yield increase per unit nutrient applied, RE refers to the increase in plant nutrient uptake per unit nutrient applied, and PFP refers to the crop yield per unit nutrient applied. Measurements of RE, AE, and PFP for applied K resulted in large location-to-location variability. Mean RE values across three years were 47, 44, and 34% for Hebei, Shandong and Shanxi, respectively. Mean AE values were 8.5, 8.2, and 6.7 kg/kg, while mean PFP values were 77, 88, and 57 kg/kg for Hebei, Shandong and Shanxi, respectively. The different values for K nutrient use efficiency were related to how much fertilizer was used and how much grain yield or yield increase was obtained by K application. For example, the very high PFP value of 134 kg/kg in 2008 in Shandong was due to the relatively low K application rate (60 kg K₂O/ha) and very high grain yield (**Figure 1**).

In summary, K application increased wheat grain yield, and net profitability in most cases in northcentral China. The average yield response to K application was less than 1 t/ha, and K use efficiency parameters of RE, AE, and PFP were relatively low. Therefore, further best management practices, through 4R Nutrient Stewardship (right source at the right rate, right time and right place) should be integrated into common practices to

improve fertilizer use efficiency for wheat. **DC**

Dr. He is Deputy Director, IPNI China Program; e-mail: phe@ipni.net. Dr. Jin is Director, IPNI China Program; e-mail: jyjin@ipni.net. Dr. Hongting Wang is with the Soil and Fertilizer Institute (SFI), Shanxi Academy of Agricultural Sciences (AAS); e-mail:htwang@ipni.ac.cn. Mr. Rongzong Cui is with the SFI, Shandong AAS; e-mail: rzcu@ipni.ac.cn. Mr. Chunjie Li is with the SFI, Hebei AAS; e-mail: chjli@126.com.

References

- Chinese Society of Soil Science. 2000. China Agricultural Sciencetech Press, Beijing. (In Chinese)
- Portch, S. and A. Hunter. 2002. Special publication No. 5. PPIC China Program, Hongkong, pp62.
- Fixen, P.E. 2007. In Proceedings of the symposium on Information Technology in Soil Fertility and Fertilizer Management. China Agriculture Press.
- Pampolino, M., C. Witt, J.M. Pasuquin, and P.J. Sinohim. 2011. International Plant Nutrition Institute, Penang, Malaysia. <http://seap.ipni.net/articles/SEAP0059-EN>.
- He, P., J.Y. Jin, M. Pampolino, and A.M. Johnston. 2012. Plant Nutrition and Fertilizer Science, 18 (2): 499-505.

2012 IPNI Crop Nutrient Deficiency Photo Contest Announced

Once again we welcome all those with a keen eye and ready access to agricultural production, at either the field or research plot scale, to seek out and gather their best examples of crop nutrient deficiency for entry into the 2012 edition of our photo contest.

The competition continues to foster awareness about, and focus attention on, identifying the common traits of nutrient deficiency for a wide range of crops. We are proud of how this contest has grown into an international challenge to field researchers, farmers, students, and other interested in crop production.

The competition continues with its four nutrient categories: Nitrogen (N), Phosphorus (P), Potassium (K), and Other (Secondary and Micronutrients). Entrants are limited to one entry per category (i.e., one individual could have an entry in each of the four categories). The winner in each category will receive a cash prize of USD 150 while second place receives USD 75. Selection of winners will be determined by a committee of IPNI scientific staff.

Photos and supporting information can be submitted until December 11, 2012 (5 pm EDT). Winners be notified and the results will be announced at our website and in this publication in January of 2013. Entries should only be submitted as original, digital files. Please see the contest site www.ipni.net/photocontest for all details. **DC**

