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## Module 4.5-3 Recommend right rate of potassium application for rapeseed in Hubei.

Potash fertilization is very important and profitable in China's crop production. To realize sustainable agricultural development with limited potash resources in the country, there is a great challenge to increase the use efficiency of potash in agriculture. Based on a number of potash omission field trials and soil test results for available potassium (K), most crops need a moderate level of soil soluble K supply to achieve a normal yield, except for some high yielding forage crops and tuber crops such as potato, which need high levels of soil K. In the last three decades, about two-thirds of the paddy soils and half of the upland soils showed K deficiency in south China. These soils comprise 80% of the total soil K deficient area in the country.

Since 1980, scientists in south China carried out a number of research projects supported by the International Plant Nutrition Institute, based on different soil K status, cropping patterns, interactions between different soil nutrients and other factors. The selected crops in the projects included main crops such as rice, corn, peanut, and rapeseed. These experimental results showed that the crops have good responses to K fertilization.

Based on soil available K testing (by ammonium acetate and determined using a flame photometer) from 41 field experiments in Hubei during 1990 to 2002, the right K application rates for rapeseed in Hubei were studied as shown in **Table 1**. These studies were based on soil available K test and aimed to reach target crop yields and maintain soil test K levels. They were widely used and improved for subsequent recommendation for farmers in the province.

**Table 1.** Rapeseed potash application rates and yield responses based on soil test in Hubei.

Field numbers	Soil available K, mg/kg		K <sub>2</sub> O application rate, kg/ha	Yield, kg/ha		Yield increase by 1 kg K <sub>2</sub> O	VCR
	Range	Average		NP	NPK		
8	<40	36.9	120	738	1,364	5.22	5.43
15	40-50	45.8	115	1,021	1,561	4.70	4.89
12	50-60	54.9	110	1,255	1,693	3.98	4.14
6	60-70	67.8	105	1,794	2,042	2.36	2.45

**Notes:** VCR = value:cost ratio. Price assumptions: K<sub>2</sub>O = ¥ 5.00/kg, rapeseed = ¥ 5.20/kg, 1US\$ = ¥ 6.20.

### References

Lu, J. et al. 2004. Evaluation of Soil K Fertility and Rational K Fertilization, *In* Proceedings of 10th International Potash Symposium, 66-72.

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