Global Partnership on Nutrient Management
BMP Case Study

Overview

Name: The Right Source and Rate of Potassium (K) for Processing Tomatoes

Location/Terrain: Xinjiang, China

Crop(s): Tomatoes

Nutrient(s): Potassium (K)

Rationale: Due to years of omission of K in nutrient management in production of tomatoes in the region, yields were restricted by inadequate K.

Issue(s) of Concern/Challenges:

Farmers often omitted K in nutrient management in the production of tomato crops for years, leading to significant soil K depletion and decreased soil K availability. Therefore, the yield and benefit of processing tomatoes in the northwestern province is often restricted by inadequate K nutrition.

Practice Description:

Test different types of K fertilizer to see which one increases yields in a cost-effective manner.

Practice Objectives:

Find both the most cost-effective and yield maximizing K containing fertilizer

Outcomes:

The most common sources of K fertilizer are KCL, KH2PO4, KNO3 and K2SO4. It was concluded that KCL was the most economical source of K.

Significance:

The use of KCL resulted in an increase in yields and profit.

Data/Graphs:

Table 1. Effect of different sources of K on yield and benefit of processing tomatoes in Xinjiang (2004-2005) (Hu et al., 2007; Zhang et al., 2008).

K source	2004				2005	
	Toutunhe farm 1		Toutunhe farm 5		Toutunhe farm 5	
	Yield, kg/ha	Income from K application, $/ha	Yield, kg/ha	Income from K application, $/ha	Yield, kg/ha	Income from K application, $/ha
KCl	78,510	1,144	63,225	655	97,366	407
K_2SO_4	73,350	972	57,900	478	90,725	143
$K_2SO_4 \cdot 2MgSO_4$					90,862	130

Table 2. Effect of different sources of K on yield and benefit of processing tomatoes in Xinjiang (2004-2005) (Hu et al., 2007; Zhang et al., 2008).

	K_2O rate, kg/ha	Yield t/ha	Lycopene, mg/100g	Solids, %	Vitamin C, mg/100g	Income from fertilizer application, $***
2003*	0	86.1 b**			10.5	
	90	92.6 b			19.2	159
	180	101.3 a			11.1	388
	270	91.7 b			9.2	11
2004*	0	95.1 b	6.1	8.9	8.0	
	90	98.8 b	8.0	8.9	8.3	64
	180	109.0 a	10.5	10.5	9.7	341
	270	95.4 b	8.6	8.5	8.9	-164

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