MANAGING CLUB ROOT DISEASE OF CABBAGES IN SA PA

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INTRODUCTION

Cabbages are an important vegetable crop in the Lao Cai Province of Vietnam. Club root disease is caused by the fungus-like pathogen *Plasmodiophora brassicae*, and is the most important disease of vegetable brassica crops worldwide. It has been the most devastating disease for vegetable farmers in Sa Pa town for the last five years, with losses of up to 100% in some farms. Most farmers do not know how to control the disease and often destroy whole crops to stop it spreading. Resting spores of this pathogen can survive in soils for more than 15 years so rotating crops is not a viable management option. This project aims to firstly test and optimize interventions in controlled experiments before offering them to the farming systems team for evaluation by farmers.

Club root causes stunting and wilt of cabbage plant

Large tumor-like swellings on roots

METHODS

Trials were established on vegetable farms in Sa Pa that had previously suffered from club root. Beds of 12 plants were formed in a Latin Square design for each trial plot with five replicates for each of the following treatments:

Treatment 1: Untreated control

Treatment 2: Agricultural lime

Treatment 3: Fluazinam drenched seedlings immediately after transplanting

Treatment 4: Chopped spring onions at 5kg/ha (Experiment 1) or Flusulfamide drenched seedlings immediately after transplanting (Experiment 2)

Treatment 5: Lime + Fluazinam

Plant roots were rated for disease severity (0-5 rating, from no disease-dead) and heads were weighed to obtain marketable fresh weights.

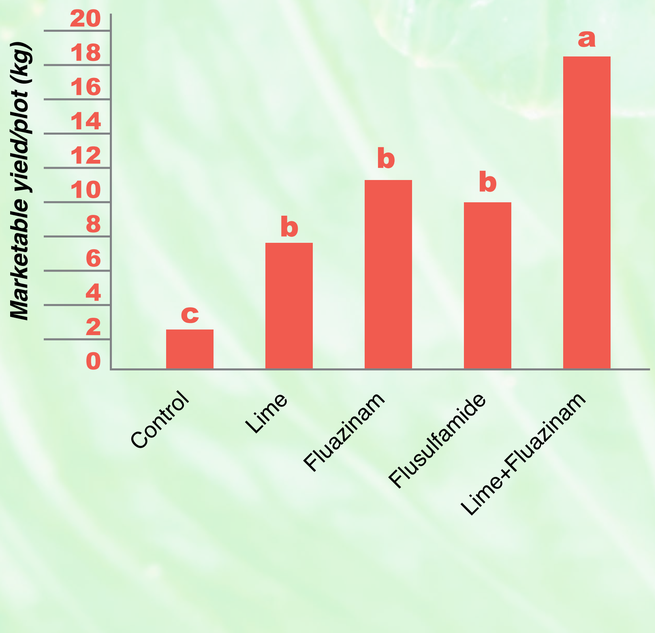
RESULTS

Experiment 1: There was no significant difference on marketable cabbage weight with the application of lime, compared with the control. There was a significant result however with the application of Fluazinam and Fluazinam + lime. The application of spring onions was unsuccessful in this instance but it is suspected that this is a function of the timing of application. Best results are seen with a delay of a several weeks between application of the onions and planting, however, in this instance planting occurred too soon after the spring onions were applied.

Experiment 2: There was a significant improvement in cabbage weight with the applications of lime, Fluazinam and Flusulfamide compared to the control however the combined application of lime + Fluazinum saw the most significant result.

Marketable Yield – Experiment 1

Marketable Yield – Experiment 2



TREATMENT	INPUT FOR CLUBROOT CONTROL PER SAO (360M²)			OTHER INPUT COSTS PER SAO (FERTILISER, SEEDS, OTHER PESTICIDES) (VND)	CABBAGE YIELD (KG/SAO)	AVERAGE SELLING PRICE (VND/KG)	INCOME PER SAO (VND)	RETURN PER SAO (VND)
	LIME (KG)	FUNGICIDE	TOTAL INPUT (VND)					
Control	0	0	0	1,226,200	278.5	10,000	2,785,000	1,558,800
Lime	180	0	900,000	1,226,200	843.4	10,000	8,434,000	6,307,800
Fluazinam + metalaxyl	0	5 packs	200,000	1,226,200	1180.6	10,000	11,806,000	10,379,800
Flusulfamide	0	10.8 kg	720,000	1,226,200	1080.0	10,000	10,800,000	8,853,800
Fluazinam + lime	180	5 packs	1,100,000	1,226,200	1946.1	10,000	19,461,000	17,134,800