

Fungicide treatments for the control of potato late blight in Papua New Guinea

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Introduction

An epidemic of late blight swept through the highlands of PNG in 2003, all but destroying crops of the popular potato variety Sequoia and depriving smallholder farmers of an important source of cash. Fungicide products approved for late blight control in PNG, namely those containing Cu (cuprous oxide and copper hydroxide and oxy-chloride), chlorothalonil and the systemic potassium phosphonate, were evaluated in a series of field trials on Sequoia.

Methods

Field trials were conducted at Tambul and Mt Hagen (2340 & 1600 masl; annual rainfall 3,000-4,000 & 1700 mm; min-max temps 16-23 and 18-26°C) to (i) compare standard rates of Copper Nordox® (58% Cuprous oxide) and Echo 720® (720 g/L chlorothalonil) applied at 5, 7, 14 and 21 day intervals and (ii) to compare three rates of Agri-Fos 600® (600 ml/L potassium phosphonate)(1800, 2400, 3000ppm) at 7, 14 and 21 days intervals against a standard rate of Echo 720 (every 7 days) and an untreated control.

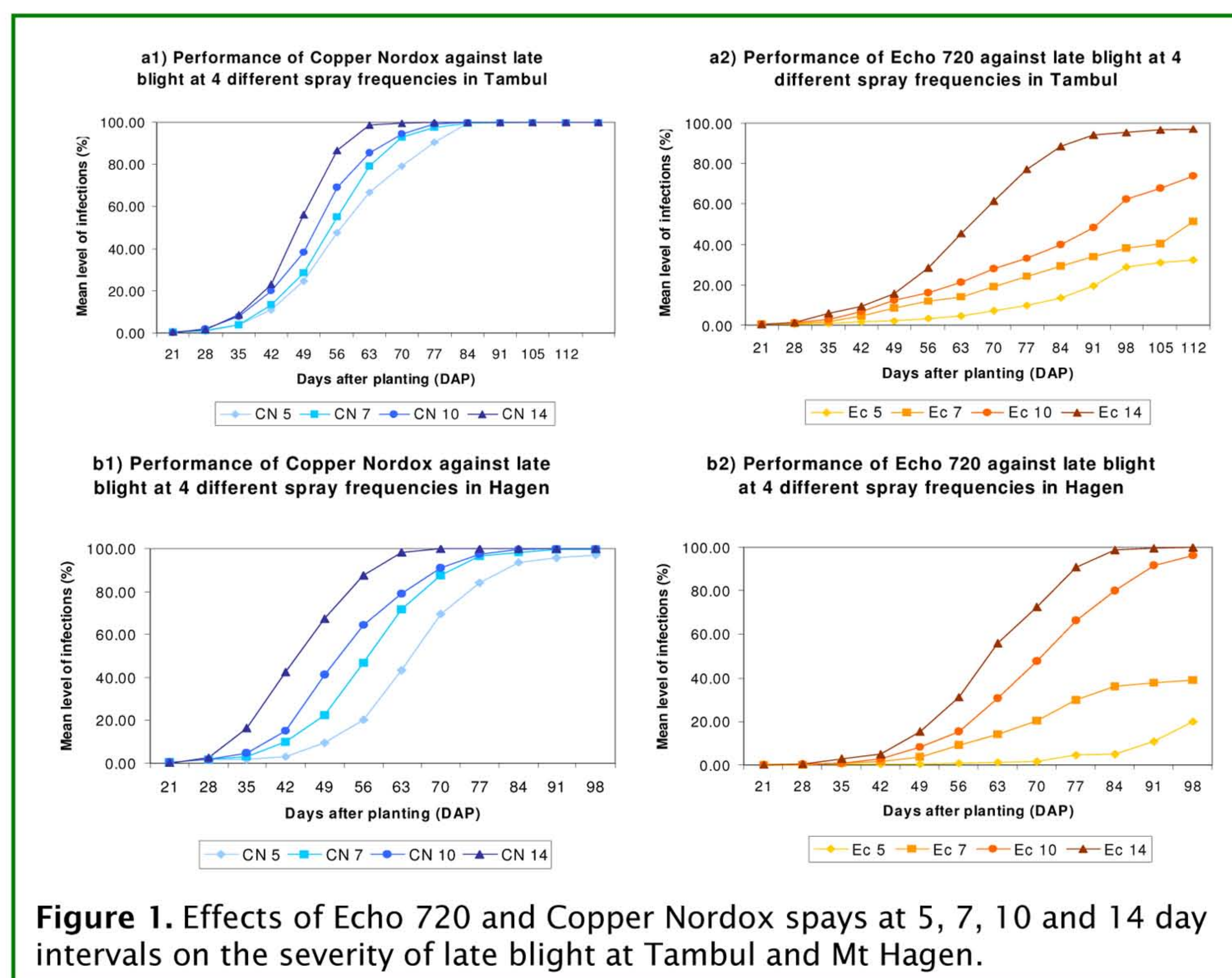


Figure 1. Effects of Echo 720 and Copper Nordox sprays at 5, 7, 10 and 14 day intervals on the severity of late blight at Tambul and Mt Hagen.

Table 1. Total yield of potatoes from two sites treated with Echo 720 or Copper Nordox at 5, 7, 10 & 14 day intervals.

Total Yield (t/ha) (Tambul)		
Spray Frequency	Echo	Copper Nordox
5 days	29.7	22.9
7 days	25	15.7
10 days	29.9	14.7
14 days	25.3	15.1
LSD (5%)	4.1	4.1
Total Yield (t/ha) (Hagen)		
Spray Frequency	Echo	Copper Nordox
5 days	36.9	14
7 days	34.3	9.7
10 days	23.5	8.7
14 days	13.9	8.8
LSD (5%)	3.1	3.1

Table 2. Marketable yield of potatoes sprayed with 3 rates of phosphonate at 7 day intervals, compared with Echo 720 (7 days) and an untreated control.

Spray frequency	Spray rate	Marketable Yield (t/ha)	
		Tambul	Hagen
<i>Phosphonate</i>			
7 days	1800 ppm	5.1	4.5
7 days	2400 ppm	4.4	8.2
7 days	3000 ppm	5.6	7.8
<i>Untreated</i>			
	Echo	10.8	11.7
LSD (5%)		2.0	4.2

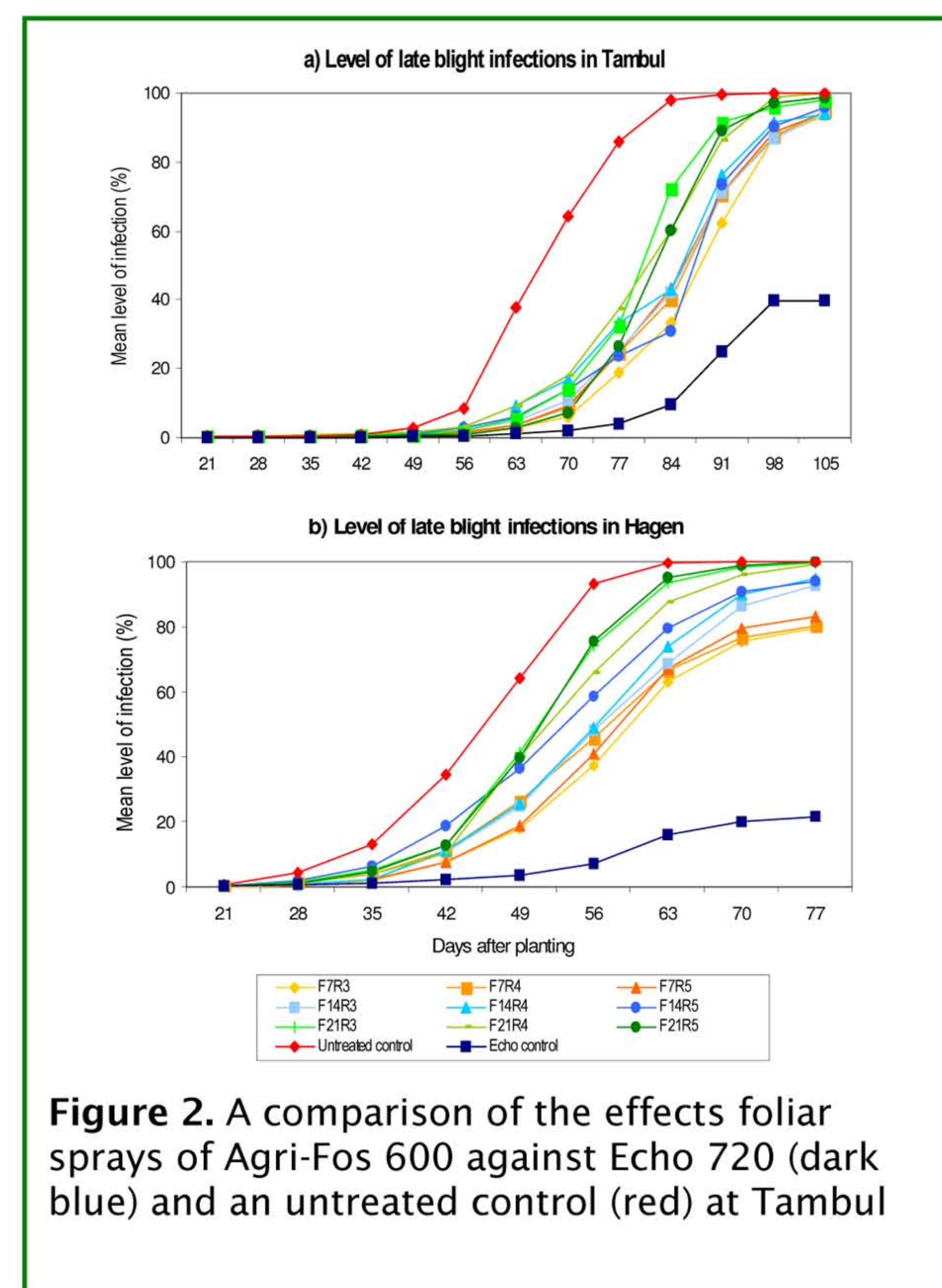


Figure 2. A comparison of the effects foliar sprays of Agri-Fos 600 against Echo 720 (dark blue) and an untreated control (red) at Tambul

Results and Discussion

Chlorothalonil treatments were more effective in protecting foliage from late blight than Cu treatments, resulting in 200% to 300% higher yields. Potassium phosphonate treatments failed to control late blight on Sequoia, providing only marginal yield benefits over the untreated control at one of two trial sites. Resistant varieties have been identified that potentially need only minimum or no fungicide sprays.