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Short Communication

Evaluation of Infinito 687,5 SC Fungicide Usefulness for Downy Mildew Control in Cucumber Field Cultivation

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Introduction

In 2017 in Poland, cucumber was one of the most important field vegetables cultivated on 13 892 ha and with 2 490 988 tons of production [1]. Cucumber has been grown in Poland since several centuries, however only since 1985 downy mildew as its new disease appears seasonally causing a serious menace to field plantations [2]. First signs of disease infection have usually been detected in the south-eastern regions of Poland at the end of June or in July and then downy mildew spreads to nearly regions in 3-5 weeks depending on weather conditions [3]. Actually, protection against this disease is based on cucumber resistant varieties and sprayings with several fungicides [4]. One of them is Infinito 687,5 SC being a mixture of fluopicolide and propamocarb hydrochloride [5]. The aim of this study was evaluation of Infinito 687,5 SC fungicide usefulness in control of downy mildew in cucumber field cultivation in central-eastern region of Poland.

Material and Methods

The experiment was carried out on a field located in Łomazy village (51°54'N; 23°10'E) in 2016. The soil was a sandy clay loam containing 2.9% of organic matter and of 6.9pH (KCl). On May 22th the seeds of cucumber (Cucumis sativus L.) 'Julian F1' were seeded at the rate of 3kg·ha^{-1} on two 10m x 4m plots in four rows with 1 m distance between rows. One row was considered as one replicate of 10m^2 area and split plot was the experimental design. Cucumbers grown on one plot were not protected against downy mildew (Pseudoperonospora cubensis (Berkeley & Curtis) Rostovzev) and cucumbers grown on the second plot were sprayed three times with Infinito 687,5 SC (625g propamocarb hydrochloride + 62.5g fluopicolide in 1 l of product). First spraying using 1.6 l of Infinito 687,5 SC mixed with 700 l of water·ha^{-1} was affected on July 12th after observing first disease symptoms. Afterwards, two succeeding sprayings were realized retaining 10 days interval between treatments. Starting on July 16th, cucumber fruits were picked every 3 days till September 5th. On August 5th, residues of propamocarb and fluopicolide in fresh cucumber fruits were determined. Five days later, when cucumbers were in full vegetation several plant growth parameters and content of some compounds in cucumber fruits were measured. Percent of cucumber leaf area affected with powdery mildew was evaluated on August 17th.

Results

Protected cucumber plants developed longer shoots, bigger leaves and produced significantly higher total and marketable fruit yield in comparison to control plants (Table 1). Spraying with fungicide did not affect the length, diameter and weight of cucumber fruits. It did not affect also the content of dry matter, total sugars, vitamin C and chlorophyll A and B (Table 2). However, the fruits produced by protected plants contained nitrates and nitrites significantly more than control ones. On August 17th, 32% of leaf area of control plants was affected with downy mildew in comparison to 3% on plants treated with fungicide. Propamocarb and fluopicolide residues determined in cucumber fresh fruits four days after last spraying were lower than 0.002 mg·kg^{-1} limit of their detection.

Table 1: Effect of spraying with Infinito 687,5 SC on plant growth parameters and fruit yield.

Measured trait	Infinito 687,5 SC	Control	Mean	LSD0.05
Shoot length (cm)	158.9	173	171.4	13.97
Leaf diameter (mm)	117	129	123	11.8
Fruit length (mm)	89	86	87	n. s.
Fruit diameter (mm)	29.8	28.9	29.4	n. s.

Fruit weight (g)	56.4	55	55.7	n. s.
Total yield (dt·ha^{-1})	446.3	373.2	409.8	52.43
Marketable yield (dt·ha^{-1})	343.2	279.9	311.6	43.86

Table 2: Effect of spraying with Infinito 687,5 SC on content of some compounds in fruits.

Measured trait	Infinito 687,5 SC	Control	Mean	LSD0.05
Dry matter (%)	4.37	4.73	4.55	n. s.
Total sugars (%)	1.35	1.53	1.44	n. s.
Nitrates (mg·kg^{-1})	309.93	93.46	201.7	186.251
Nitrites (mg·kg^{-1})	0.84	0.36	0.6	0.449
Chlorophyll A (mg·g^{-1})	0.21	0.26	0.24	n. s.
Chlorophyll B (mg·g^{-1})	0.06	0.1	0.08	n. s.
Vitamin C (mg·100g^{-1})	2.36	2.53	2.45	n. s.

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