



# Susceptibility of selected apple cultivars to fire blight (*Erwinia amylovora*)

## INTRODUCTION

- One of the aims of the apple breeding program conducted at the National Institute of Horticultural Research in Skierniewice, Poland, is to develop new genotypes either resistant or showing low susceptibility to apple scab (*Venturia inaequalis*), apple powdery mildew (*Podosphaera leucotricha*) and fire blight (*Erwinia amylovora*). New cultivars should produce high yields of a good fruit quality and should be well adapted to climatic conditions of Poland. Cultivation of such cultivars is enabling the production of apples without or with very low level of chemical residues harmful to human health at markedly reduced production costs.

## MATERIAL AND METHODS

- In the year 2024 plant material of 4 apple clones (No. 23 – J-2002-25-03 – ‘Sawa’ x ‘Rubin’, No. 28 – J-2003-11-04 – ‘Gold Milenium’ x ‘Szampion’, No. 58 – J-2004-29 – ‘J-79’ x ‘Rubinola’, No. 64 – J-2002-21 – ‘Rubin’ x ‘Gold Milenium’) and 3 reference cultivars (‘Szampion’, ‘Idared’ and ‘Free Redstar’) were propagated for testing susceptibility to fire blight. The plant material was produced by the hand-winter grafting of genotypes on M.9 rootstock and planted in 5 litre containers filled with a mixture (1:1 by volume) of peat substrate and compost soil, and placed in a high plastic tunnel. The terminal shoot tips were inoculated with a highly virulent strain (Ea 659) of *Erwinia amylovora* ( $10^7$  cfu/ml) using scissors. After inoculation, the tips of the inoculated shoots were covered with plastic bags for 24 hours to prevent the inoculum from drying up. The progress and severity of fire blight symptoms were assessed 2, 4 and 6 weeks after inoculation. The calculated disease severity values (percentages of shoot necrosis) were presented as disease susceptibility scores.

### INOCULATION OF PLANTS



### FIRST SYMPTOMS AFTER INOCULATION



## RESULTS

**Table 1.** Percentage of shoot infection (mean value for the length of the necrosis on the shoot to the length of the shoot) after inoculation with a suspension of a highly virulent wild strain of *Erwinia amylovora* Ea 659 bacteria (Skierniewice, 2024)

Genotype	Percentage of shoot infection (2 weeks after inoculation)*	Percentage of shoot infection (4 weeks after inoculation)*	Percentage of shoot infection (6 weeks after inoculation)*
Wars	5,08 c	7,80 b	15,76 b
Free Redstar	0,00 a	0,84 a	1,24 a
Nr 64 (Goldin)	2,42 b	10,11 b	19,80 b
Nr 28	2,73 b	8,48 b	17,21 b
Szampion	7,07 d	16,97 c	41,35 d
Idared	8,56 e	15,55 c	44,62 d
Nr 58	4,29 c	14,78 c	31,05 c

\*Means marked with the same letter do not differ significantly according to the NEWMAN - KEULS test at  $\alpha = 0,05$



**Fig. 1** The symptoms observed 6 weeks after inoculation of A –Free Redstar, B - Idared

## CONCLUSIONS

- ✓ The least infected shoots after inoculation with a suspension of the highly virulent wild strain of *Erwinia amylovora* Ea 659 bacteria were observed in the cultivar ‘Free Redstar’.
- ✓ The most susceptible cultivars were ‘Szampion’ and ‘Idared’ and clone No. 58.
- ✓ Newly selected clones No. 23, No. 28 and No. 64 were characterized by medium sensitivity to the pathogen.

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