IMPORTANCE OF CULTIVAR CHOICE IN PREVENTING INFESTATION BY THE BLACKCURRANT GALL MITE (*Cecidophyopsis ribis* WESTW.) ON BLACKCURRANT PLANTATIONS

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A B S T R A C T

In the last years fast increasing of black currant gall mite *Cecidophyopsis ribis* (Westw.) dissemination is observed in the black currant plantations in Latvia. Furthermore, black currant bud gall mite is the most important transfer agent of the reversion virus, which results in rapid decrease of productivity in plantations. One of the determinant factors for the dissemination of black currant gall mite is the susceptibility of black currant cultivars to this pest. As effective means of protection against this pest are still lacking, cultivation of resistant cultivars can be a certain guarantee against the fall of productivity.

The occurrence of bud gall mite has been studied for 62 most perspective cultivars and hybrids in a 8-year old plantation. The cultivars were divided into 3 groups, depending of percent infestation – resistant (0>1% infested buds, medium susceptible (1-20% infested buds), susceptible (< 20% infested buds).

The resistant cultivar group included cvs. and hybrids 'Guliver', 'Vakariai', 'Zagadka', 'Titania', 'Yadrenaya', 'Black Dawn', 'Chernecha', *Ribes americanum x nigrum* F_1, 'Iynskaya Kondrashevoi'.

Medium susceptible were: 'Bagira', 'Ben Alder', 'Vernisazh'.

Susceptible were: 'Katyusha', 'Sevchanka'.

Key words: black currant, black currant gall mite, cultivars, resistance

INTRODUCTION

Blackcurrants are the second most important small fruit crop in Latvia after strawberries. The area covered by subsidized plantations increased by 598 hectares from 1998 to 2005. The commercial cultivars grown in Latvia

are 'Zagadka', 'Titania', 'Ojebyn', 'Katyusha', 'Pamyati Vavilovu' and 'Ben Lomond' (Laugale, 2000; Kampuss and Strautina, 1998; Strautina, 2001). These cultivars are grown mostly for processing and are harvested mechanically.

Because it is possible to grow most resistant cultivars without chemicals, quite a few large blackcurrant plantations have been established on biological farms.

One of the biggest problems facing blackcurrant growers wherever blackcurrants are grown is the blackcurrant bud gall mite *Cecidophyopsis ribis* (Westw.). This pest quickly spreads in plantations (Smolarz, 1993). The rate of spreading depends on several factors, including weather conditions, the level of infestation in the growing area, and the susceptibility of the cultivar grown (Kuminov and Zhidekhina, 2003). The blackcurrant gall mite infests new buds throughout the blossoming period, when the average temperature is at least 13 or 14°C. The pest does not migrate when temperatures are lower or when the weather is rainy (Melekhina**,** 1982). The blackcurrant gall mite feeds on blackcurrant buds, which significantly reduces fruit yield. It also carries a viral disease called reversion (Pluta and Zurawicz, 2002).

The blackcurrant gall mite is generally impossible to control when the proportion of infested buds reaches 5%. Crop losses are too great to economically justify keeping the plantation (Brennan et al., 1993)

Cultivars which are highly resistant to the blackcurrant gall mite share the following traits:

- generative buds differentiate early and quickly;
- buds differentiate all at the same time;
- shoots grow quickly over a short time period;
- shoots mature early all at the same time; and
- bud scales are tightly closed.

Unfortunately, there are no chemicals or techniques to effectively control the black currant gall mite except for planting resistant cultivars (Knyazev and Ogoltsova, 2004).

Cultivars which are resistant to the blackberry bud gall mite are not always resistant to reversion. Blackcurrant varieties which are resistant to reversion include *Ribes dikuscha, R. cereum, R. nigrum var. sibiricum, R. bracteosum, R. carrierieriei,* 'Golubka', 'Rus' and 'Uspeh' (Ravkin, 1988). Most strains of *R. dikuscha* which are highly resistant to reversion are very susceptible to the blackcurrant gall mite (Ravkin, 1988).

The aim of this study was to evaluate blackcurrant varieties in terms of their resistance to the blackcurrant gall mite.

MATERIAL AND METHODS

In 2005, a trial was carried out with 62 of the most promising cultivars and hybrids in the blackcurrant collection at the Horticultural Plant Breeding Experimental Station in Dobele, Latvia. The collection had been established

in 1997. Bushes were planted 3 x 1 meter apart. The bushes were not protected against the blackcurrant bud gall mite. Weeds were controlled with herbicides.

Three branches from four different plants of each cultivar were examined, and the number of normal and malformed buds was recorded separately for each branch.

The varieties were divided into three groups on the basis of the level of infestation:

- resistant: less than 1% of the buds were infested;
- moderately susceptible: 1 to 20% of the buds were infested; and
- susceptible: more than 20% of the buds were infested.

Data were statistically elaborated with the help of the statistics program SPSS.

RESULTS AND DISCUSSION

In 2001 and 2002, temperature in January and February were from 2 to 4°C higher than average, which favored the multiplication if the blackcurrant bud gall mite.

The rate of spreading was particularly high over the last two years.

Removing damaged buds was not an efficient method of preventing the spread of the blackcurrant bud gall mite. A few years after damaged buds were removed, the rate of infestation returned to the same level.

The following varieties were categorized as resistant on the basis of the level of infestation: 'Belorusskaya Sladkaya', 'Minai Shmirjov', 'Ben More', 'Pilot A. Mamkin', 'Black Dawn', *R. americanum, R. nigrum sibiricum,* 'Rosenthals Langtraubige', 'Chernecha', 'Sanyuta', 'Chernii Kentavr', 'Stella II', 'Guliver', 'Svita Kievskaya', 'Ijunskaya (Kondrashevoi)', 'Triton', 'Joniniai', 'Vakariai', 'Lunnaya', 'Zagadka' and 'Malling Jet' (Tab. 1). Another nineteen varieties were moderately susceptible, and the rest were susceptible. The susceptibility levels of selected varieties are presented in Figure 1.

The only commercial cultivar which had no traces of infestation was 'Zagadka', which had been previously reported to be only moderately tolerant (Melehina, 1982).

Because of its high commercial value, 'Katyusha' has been recommended for widespread cultivation. However, in this trial, 10.7% of its flower buds were infested. About the same levels of infestation were found in 'Mara', NK 100 and NK 89, which are hybrids of 'Katyusha'. Therefore, 'Katyusha' donates susceptibility to the blackcurrant bud gall mite to its progeny. Because of the limited number of pesticides available in Latvia, 'Katyusha' should be planted only in areas which are not infested by the blackcurrant bud gall mite.

Table 1. Level of bud damage caused by the blackcurrant gall mite in several blackcurrant cultivars

Cultivar	Mean damage [%]	Std. Deviation
Almiai	0.77	0.24
Bagira	4.90	3.08
Belorusskaya Sladkaya	0.00	0.00
Ben Alder	8.25	3.09
Ben More	0.00	0.00
Ben Sarek	0.00	0.00
Black Dawn	0.00	0.00
Chereshneva	0.490	0.17
Chernecha	0.00	0.00
Chernii Kentavr	0.00	0.00
Chernii Zhemchug	3.762	1.33
Detskosel'skaya	3.044	2.15
Guliver	0.00	0.00
Iynskaya	0.00	0.00
Jet	0.00	0.00
Joniniai	0.00	0.00
Katyusha	10.68	3.89
Laimiai	0.70	0.28
Lentyai	8.21	3.30
Lunnaya	0.00	0.00
Öjebyn	7.33	4.31
Orlovskii Valjs	38.25	5.46
Pamiati Ravkinu	5.65	3.33
Pilenai	0.915	0.33
Pilot A. Mamkin	0.00	0.00
R. nigrum americanum	0.00	0.00
R. nigrum var. sibiricum	0.00	0.00
Sanyuta	0.00	1.39
Selecenskaya	5.07	2.12
Sevchanka	26.61	9.95
Silvergieters Swarze	0.91	0.08
Stella II	0.00	0.00
Stor Klas	5.07	2.06
Svita Kievskaya	0.00	0.00
Titania	0.47	0.19
Vakariai	0.00	0.00
Vernisazh	7.59	3.67
Viuchiai	0.00	0.00
Vologda	0.00	0.00
Yadrenaya	0.48	0.19
Zagadka	0.00	0.00

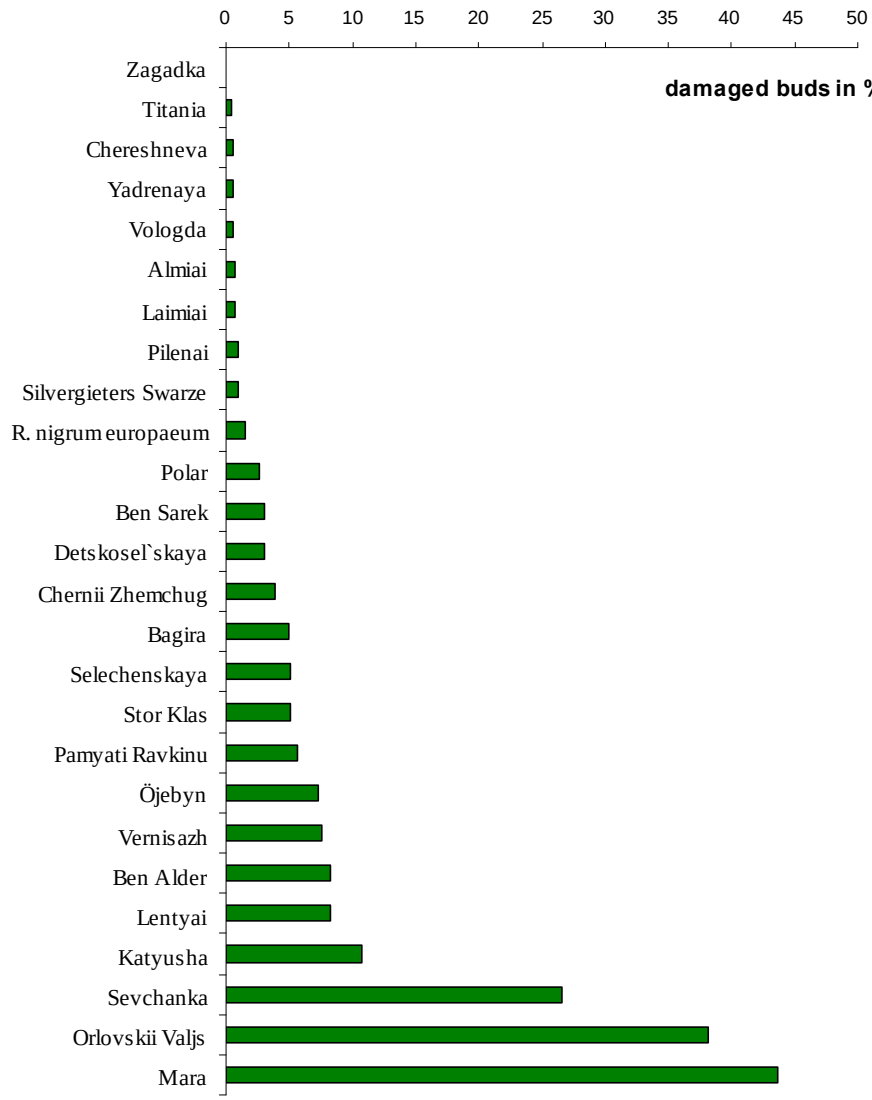

Figure 1. Susceptibility of selected blackcurrant cultivars to the blackcurrant gall mite (*Cecidophiopsis ribis* Westw.)

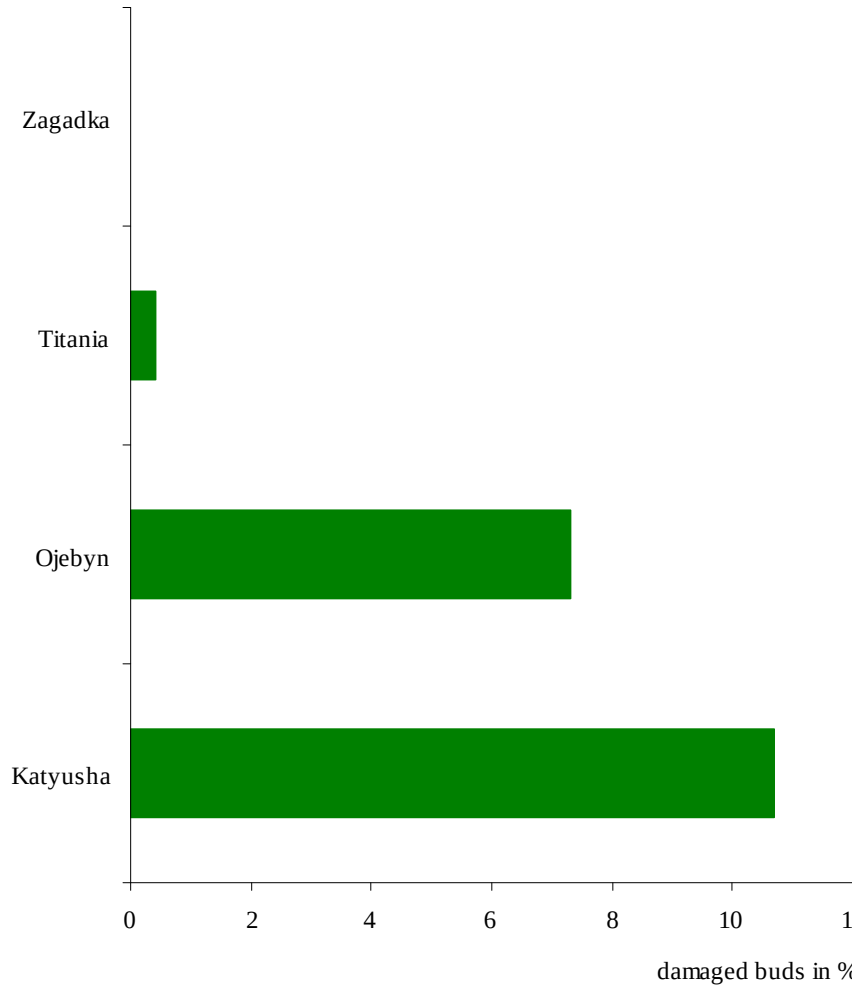

Figure 2. Susceptibility of selected commercial black currant cultivars to the blackcurrant gall mite (*Cecidophiopsis ribis* Westw.)

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DOBÓR ODMIAN PORZECZKI CZARNEJ JAKO CZYNNIK REGULUJĄCY LICZEBNOŚĆ POPULACJI WIELKOPĄKOWCA PORZECZKOWEGO (*Cecidophyopsis ribis* WESTW.)

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STRESZCZENIE

W ostatnich latach na plantacjach porzeczki czarnej na Łotwie obserwowany jest znaczny wzrost liczebności populacji wielkopąkowca porzeczkowego *Cecidophyopsis ribis* (Westw.). Szkodnik ten, poza szkodliwością bezpośrednią, jest również głównym wektorem wirusa wywołującego groźną chorobę porzeczki – rewersję. Produktywność roślin zaatakowanych przez wymienione agrofagi gwałtownie spada, przez co prowadzenie plantacji staje się nieopłacalne. Jednym z czynników warunkujących szybkość rozprzestrzeniania się wielkopąkowca jest podatność odmian porzeczki na zasiedlenie przez tego szkodnika. Ze względu na brak efektywnych metod zwalczania wielkopąkowca, uprawa odmian odpornych może stać się istotnym czynnikiem decydującym o opłacalności produkcji owoców porzeczki czarnej.

Ocenę liczebności populacji wielkopąkowca porzeczkowego przeprowadzono na 8-letnich krzewach 62 najbardziej perspektywicznych odmian i klonów hodowlanych porzeczki czarnej. Oceniane genotypy klasyfikowano w zależności od procentowego udziału zasiedlonych pąków na: odporne (0>1% zasiedlonych pąków), średnio wrażliwe (1-20% zasiedlonych pąków) oraz wrażliwe (< 20% zasiedlonych pąków).

W grupie genotypów odpornych znalazły się następujące odmiany i klony hodowlane: ‘Guliver’, ‘Vakariai’, ‘Zagadka’, ‘Titania’, ‘Yadrenaya’, ‘Black Dawn’, ‘Chernecha’, *Ribes americanum x nigrum* F_1, ‘Iynskaya Kondrashevoi’. Do genotypów średnio wrażliwych zakwalifikowano odmiany ‘Bagira’, ‘Ben Alder’ i ‘Vernisazh’, natomiast do wrażliwych odmiany: ‘Katyusha’ i ‘Sevchanka’.

Słowa kluczowe: porzeczka czarna, wielkopąkowiec porzeczkowy, odmiany, odporność