

***Blumeriella jaapii* (Rehm) v. (Arx) infection of some sweet cherry cultivars in two years with different precipitation conditions**

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Summary: We examined *Blumeriella jaapii* (Rehm) v. (Arx) infection on 21 sweet cherry cultivars in the cultivar-collection of the Experimental Station Pallag of the University of Debrecen, in 2004 and 2005. Considerable differences were detected in the infection degree of the different cultivars. In 2005, due to the more humid weather, the average infection highly exceeded data of the previous year. No symptomless cultivars were detected in either year. The least sensitive ones were Linda and the cultivar 11/106. The most sensitive cultivars were Early Müncheberg, Biggareau burlat and Round Solymári. Infection degrees of Alex, Rita and Vega were different from those of other cultivars on the basis of the two experimental years.

It is important to consider both the specific weather conditions of the year and cultivar resistance at planning the plant protection system. It is recommended for each cultivar to perform a fungicide-spraying after the harvest.

Key words: cherry leaf spot, *Blumeriella jaapii*, sweet cherry, cultivar susceptibility

Introduction

Consumer- and market expectations are getting more and more strict with quality standards. To fit to the newest market expectations, it is needed to introduce new, more precise technological elements in fruit production. The perfect quality and yield-safety can be most successfully achieved in intensive orchards. Phytotechnical and plant protection measures can be more easily performed on small trees, and there is a more convenient possibility to cover the orchard and establish a special irrigation system to avoid cracking and frost damage. Preservation of the healthy canopy is highly important through the vegetation, because this affects the quality and quantity of the actual yield, and also has an effect on bud differentiation, thus on potential yield of the next year. It is important to consider both the specific weather conditions of the year and cultivar resistance at planning of the plant protection system.

The extendingly precipitous weather of 2004 and 2005 was favourable for *Blumeriella jaapii* (Rehm) v. (Arx) infection. In our experiment, we found considerable differences in the degree of the infection among the cultivars.

Bud differentiation in sweet cherry starts in May and June, flower buds initiate from July and August. The differentiation continues up to the start of the dormancy in early November. Area of the photosynthetically active canopy, affects the number of the forming flower and probably their quality (Lang, 2001). In considerable portion

of the domestic sweet cherry orchards, no plant protection is done after the harvest. It frequently happens, that the infected canopy is shed in July or August. Due to the early leaf fall the condition of the trees weakens and bud differentiation will be inefficient (Jenser & Végelyi, 2003). The early leaf fall lowers fruit quality, increases frost susceptibility of the buds, further on in the following year it lowers fruit set and size, and can also entail the death of the tree (Ellis, 1995).

The canopy of the sweet cherry is mostly endangered by the pathogen *Blumeriella jaapii* (Rehm) v. (Arx). Under domestic conditions infection of the agent is due to be considered from April. Primary source of the infection are propagation organs of the fungus overwintered on fallen leaves (Holb, 2005).

There is a considerable difference in the sensitivity of sweet cherry cultivars to *Blumeriella jaapii* (Rehm) v. (Arx) infection (Borovinova et al., 2004).

Symptoms of the disease primarily show on the top surface of the leaves in the form of 1-3mm purple-brown spots. Later on, white-yellow acervola can be observed on the backside of the leaves at the blotches, which conidia are produced as new sources of infection (Glits, 1978).

Rainy, humid weather facilitates the continuous infection. In a study, Ellis (1995) described the terms of leaf-wetness necessary for the formation of the infection at different temperatures. According to this study, a 5 to 6-hour leaf-wetness between 16.1-21.1 °C is enough for the formation of the symptoms.

Material and method

Characteristics of the plantation

The plantation system of the intensive sweet cherry orchard established at the Research Station of the Debrecen University in Pallag in 2000 is 4×1 meter. The trees are standing on *Cerasus mahaleb* (CT500) seedlings.

Examined cultivars were: Germersdorfi 3, Linda, Katalin, Margit, Vera, Aida, Van, Alex, Valerij Cskalov, Early Müncheberg, Biggareau burlat, Rita, Black Szomolyai, Round Solymári, 6/78, 11/108, 6/17, 6/99, 6/66.

The canopy form is super-spindle. Width of the trees is 1m, and their height is about 2.5m.

Regarding the climatic conditions and soil characteristics, the experimental area represents well the ecological characteristics of the South-Nyírség region. Humus content of the sandy soil of the orchard is around 1%, its thickness is 27–29 by the Arany-scale.

The precipitation in the vegetation periods of the two years exceeded the several years' average (Figure 1). The meteorological data were provided by the Agrometeorological Observatory of the University of Debrecen Centre of Agricultural Sciences. In April, May and in the summer of 2004, 391 mm precipitation fell in total. Favourable conditions for the formation of a serious infection were provided by the frequently wet canopy. 2005 was an even more humid year, as under the five months there fell 438 mm precipitation. Due to the continuously rainy weather, the infection stage of 2005 reached the level of previous year's mid-September earlier, in mid-August.

Treatments

The plantation material was grafts without feathers that were not cut back at their first year. We performed green

pruning in the vegetative season of the subsequent year. Pruning measures were based on pruning methods worked out in the last decades (Gonda, 1979). In the second year orchard shoots came out from side buds, then each shoot was cut back to its half at their 30–40 cm length. From buds becoming terminals on shortened shoots, 1–3 secondary shoots burst out, which were also cut back in the same manner.

Plant protection works are further rendered by the fact, that there are considerable differences in ripening times of the 21 cultivars. In order to keep the food safety regulations, the plant protection was minimized from the second week of May up to the end of June, because along almost two months there is continuously some ripening fruit in the cultivar collection. Due to the food safety considerations, fungicides with longer persistence cannot be used in this period. This time is enough for the spread of the pathogen.

Data collection

Timing: We examined the degree of the infection of different cultivars in the middle of September both in 2004 and 2005. We observed 20–20 leaves from the four sides of 3–3 trees from each cultivar. Leaves were classified into five groups according to their infection degree. Categories were defined on the basis of the area of the infected surface. On the 1–5 scale the bigger numbers mean stronger infection.

Leaves of the first category were without symptoms. In the second category, most part of the leaf-surface was healthy, the infected area did not exceed 25% of the total surface. In the third category 25–50% of the leaf-surface was covered with infected spots. Leaves of the fourth category had an infected area of between 50–75%. In the fifth category, the infected area was over 75%.

Blumeriella spots merge together. These leaves usually become chlorotic and fall down.

After the collection of infection-data we averaged them, through which we could rank the cultivars by their sensitivity.

Results and discussion

Infection data of 2004 and 2005 can be seen in Figure 2. The obvious difference is due to the more raining weather in 2005, therefore, the average infection of 2005 highly exceeds data of the previous year.

Cvs. Early Müncheberg, Bigarreau burlat and the Round Solymár proved to be highly sensitive in both years. However, cvs. Rita and Vega also belonged to this category. In 2005, Round Solymári must be highlighted, as it lost its whole foliage by the middle of September, however, more fungicide treatments were performed.

Comparing all varieties, foliage of the following showed medium infection: Vera,

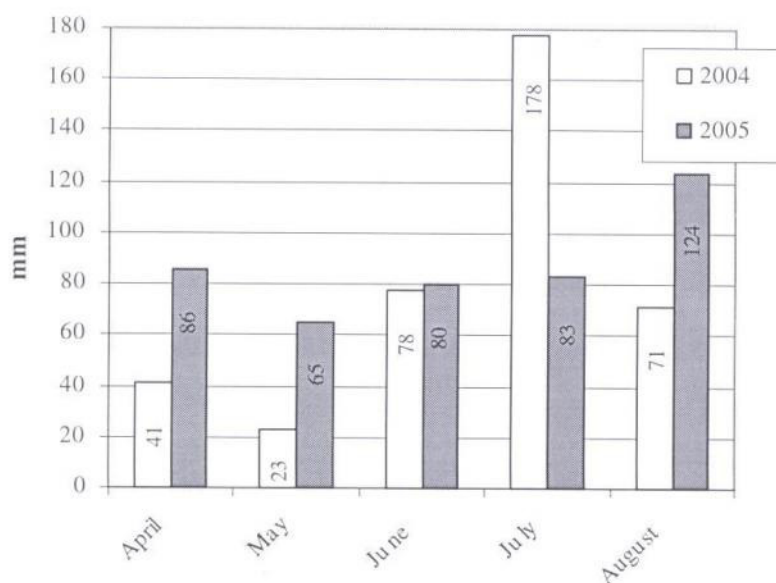


Figure 1 Precipitation data of the experimental orchard in the period of April–August (Debrecen-Pallag, 2004–2005.)

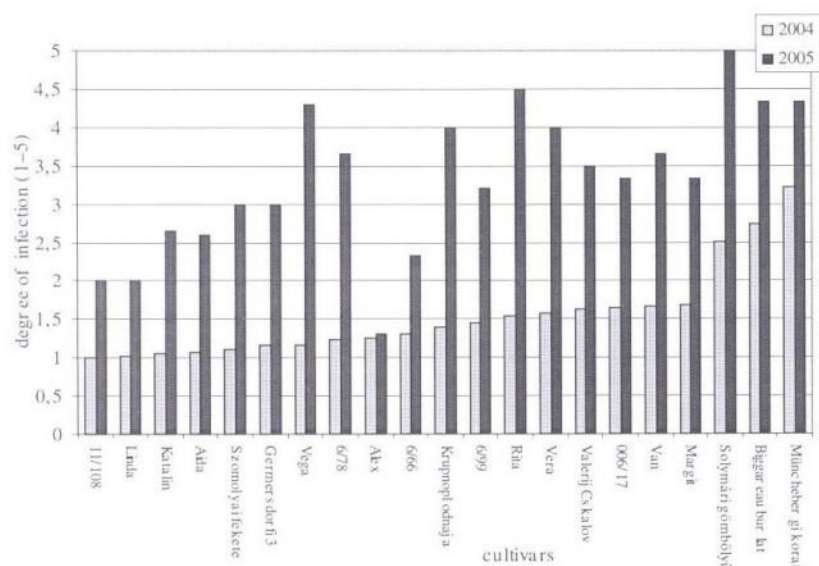


Figure 2 Infection of sweet cherry cultivars by *Blumeriella jaapii* (Rehm) v. (Arx) (Debrecen-Pallag, 2004–2005)

Krupnoplodnaja, Van, Valerij Cskalov, Margit, 6/78, 6/17, 6/99, Black Szomolyai, Germensdorf 3, 2/51, Katalin, Aida, and 6/66. In this category Aida and Katalin should be mentioned, though in the first experimental year they were in the lower infection category, however in 2005 the infection level of their foliage was higher than that of other cultivars.

In 2004, less infected cultivars were 11/108 and Linda. In 2005, in addition to these, we could observe less infection on Alex.

Sensitivity of certain cultivars were similar in the two examined years, although some cultivars showed great differences, such as Alex, Rita and Vega. Infection-level of Alex fell back greatly compared to that experienced in the previous year, while Rita and Vega showed higher sensitivity in 2005 than in 2004. Thus, the sensitivity of these cultivars needs further investigation.

It must be noted, that the symptoms on Early Münchebergi and Bigarreau burlat in 2004, besides the serious *Blumeriella* infection, were also caused by some other pathogens causing foliar spots. However, there were no significant numbers of symptoms caused by other pathogens in 2005 on any cultivar.

There is hardly any literature about *Blumeriella* sensitivity of some of the inspected cultivars. Results of our experiment are in agreement with literature data in the case of cvs. Round Solymári, Black Szomolyai and Vera (Brózik, 2000). However, cv. Van was not tolerant in our orchard, and in intensive technology cv. Katalin showed to be less sensitive. In the case of cv. Bigarreau burlat, our experience agrees with the data of Benedek et al. (1990).

From the data above it is clear, that although at a different level, in accordance with the different sensitivity of the cultivars, post-harvest fungicidal plant protection is suggested for each cultivar to preserve the healthy foliage in sweet cherry orchards. When planning the plant protection system, the sensitivity of the cultivar and weather factors should be taken into consideration. In the case of more sensitive cultivars post-harvest plant protection can be repeated several times to protect the foliage.

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