

# Susceptibility of fruit of some plum and apricot cultivars to brown rot

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**Summary:** In this three-year study, incidence of brown rot (*Monilinia* spp.) on fruit of plum and apricot cultivars were evaluated in Kecskemét, Hungary. Results showed that most plum and apricot cultivars expressed symptoms caused by *Monilinia* spp, graded between 2 and 4 (10–75%) by the end of the summer in 2008–2010. Assessments on plum showed that only cultivars ‘Besztercei’, ‘Silvia’ and ‘Tuleu gras’ were partly tolerant to *Monilinia* spp., while the most susceptible cultivars were ‘Bluefre’ and ‘Stanley’. The most tolerant apricot cultivars were ‘Borsi-féle kései rózsza’, ‘Piroska’, ‘Pannónia’ and ‘Magyar kajszai’ while the most susceptible ones were cvs. ‘Budapest’ and ‘Mandulakajszai’. Susceptibility classes showed that only one plum (‘Silvia’) and one apricot cultivar (‘Borsi-féle kései rózsza’) were available with low susceptibility.

**Key words:** *Monilinia* spp., brown rot, plum, apricot, cultivar, susceptibility class

## Introduction

Among stone fruit diseases, those fungal pathogens are of great importance which cause fruit rot. Among fruit rot pathogens *Monilinia* spp. (mainly *M. fructigena* and *M. laxa*) the most important stone fruit disease. Since the pathogens are wound parasites, it appears on the fruits at injuries after hail or strong pest damage. Brown rotting of fruits starts and then grey conidiophores appears on their surface. The fruits often mummify and stay on the tree. The primary inoculum sources of the disease are the dead woody parts and the fruit mummies. The disease can also cause significant damages during storage. Its host plants include the stone fruit species (Holb, 2004, 2006).

Some studies evaluated susceptibility of stone fruit cultivars to fungal diseases which cause brown rot. Szabó (1997a) classified several apricot cultivars into brown rot susceptibility groups. He evaluated cvs. ‘Budapest’ and ‘Mandulakajszai’ as highly, ‘Ceglédi óriás’, ‘Liget óriás’ and ‘Polonais’ as moderately and ‘Borsi-féle kései rózsza’, ‘Piroska’, ‘Pannónia’, ‘Ceglédi biborkajszai’, ‘Magyar kajszai’ and ‘Rakovszky’ as lowly susceptible to blossom and twig blights caused by *M. laxa*. In the case of plum, fruit rot is the most important damage but flower infection can also occur. Such features as vulnerable fruit peeling, long, wet weather periods during fruit maturity and clustering of fruits, are the main factors responsible for susceptibility to brown rot infection (Soltész, 1997). Szabó (1997b) classified several European plum cultivars into brown rot susceptibility groups.

He found that ‘Bluefre’ and ‘Stanley’ are highly, ‘Cacanska najbolja’ and ‘President’ are moderately, and ‘Besztercei’, ‘Silvia’ and ‘Tuleu gras’ are lowly susceptible to fruit rot caused by *M. laxa*.

Recently some additional apricot and plum cultivars were also evaluated on brown rot (Holb et al. 2007, 2010). Holb et al. (2010) showed that most apricot cultivars expressed symptoms (10–75%). The most tolerant cultivars were ‘Borsi-féle kései rózsza’, ‘Piroska’, ‘Pannónia’, ‘Magyar kajszai’ and ‘Rakovszky’ while the most susceptible ones were cvs. ‘Budapest’ and ‘Mandulakajszai’. The same authors also showed that plum cultivars ‘Besztercei’, ‘Silvia’ and ‘Tuleu gras’ were tolerant to *Monilinia* spp., while the most susceptible cultivars were ‘Bluefre’ and ‘Stanley’.

*Monilinia* spp. are causing severe infections in Hungarian stone fruit orchards if the summer is rainy. As the amount of precipitation was higher in summers of 2008, 2009 and 2010 which allowed detailed investigation on fruit brown rot of plum and apricot cultivars. Brown rot susceptibility classes were also prepared for both plum and apricot cultivars.

## Materials and methods

### Orchard site and disease assessments

The study was performed at Kecskemét in the experimental orchards of the Fruit Research Station. Eleven apricot (‘Bergeron’, ‘Borsi-féle korai rózsza’, ‘Budapest’,

'Ceglédi bíbor', 'Ceglédi óriás', 'Korai piros', 'Magyar kajszi', 'Mandulakajszi', 'Pannónia', 'Piroska' and 'Rózsakajszi') and fifteen plum cultivars ('Ageni', 'Althann ringló', 'Besztercei szilva', 'Bluefre', 'Cacanska leptotica', 'C. najbolja', 'Centenar', 'Debreceni muskotály', 'Korai besztercei', 'Olaszkék', 'President', 'Silvia', 'Stanley', 'Tuleu gras', and 'Utility') were evaluated for infections caused by *Monilinia* spp. Assessments were made in late summers of 2008, 2009 and 2010. All assessments were made on all the available trees or at least four trees per cultivar. In each tree, 4 × 50 fruits were evaluated for symptoms. Assessed fruit were classified into six groups according to their infection degree. Categories were defined on the basis of the area of the infected surface. On the 0-5 scale, the bigger numbers mean stronger infection. Fruits in grade 0 were without symptoms. In grade 1 fruit infection was between 0.1 and 10%, in grade 2 between 10.1 and 25%, in grade 3, between 25.1 and 50%, in grade 4 between 50.1 and 75%,. In grade 5, the infection level was over 75%. Data for each disease and cultivar were averaged and then analysed by using one-way analyses of variance using Excel PC programme. Data were analysed separately for plum and apricot. After analyses, three years data were averaged and these numbers were used for forming three susceptibility classes. Class 1 represented low susceptibility (grades 0–1), class 2 moderate susceptibility (grade 1.1–2.5) and class 3 high susceptibility (grades 2.6–5).

## Results and discussion

Assessment made in apricot showed that most cultivars expressed symptoms caused by *Monilinia* spp. grading between 2 and 4 (10–75%) by the end of the summer in all the three years. The most tolerant cultivars were 'Borsi-féle kései rózsza', 'Piroska', 'Pannónia' and 'Magyar kajszi' while the most susceptible ones were cvs. 'Budapest' and 'Mandulakajszi' (Figure 1). Assessments on plum showed that only cultivars 'Besztercei', 'Silvia' and 'Tuleu gras' were partly tolerant to *Monilinia* spp., while the most susceptible cultivars were 'Bluefre' and 'Stanley' (Figure 2). Our study in agreement with the study of Holb et al. (2010) where the most tolerant cultivars were 'Borsi-féle kései rózsza', 'Piroska', 'Pannónia', 'Magyar kajszi' while the most susceptible ones were cvs. 'Budapest' and 'Mandulakajszi'. Similar to present study Holb et al. (2010) also showed that plum cultivars 'Besztercei', 'Silvia' and 'Tuleu gras' were partly tolerant to *Monilinia* spp., while the most susceptible cultivars were 'Bluefre' and 'Stanley'.

Susceptibility classes showed that only one plum ('Silvia') and one apricot cultivar ('Borsi-féle kései rózsza') were available with low susceptibility (Tables 1 and 2). Results showed that most of the evaluated cultivars are not suitable for non-sprayed or organic growing condition. Though they can be grown successfully in conventional or integrated fruit production using frequent fungicide applications. In a previous study Szabó (1997b) classified

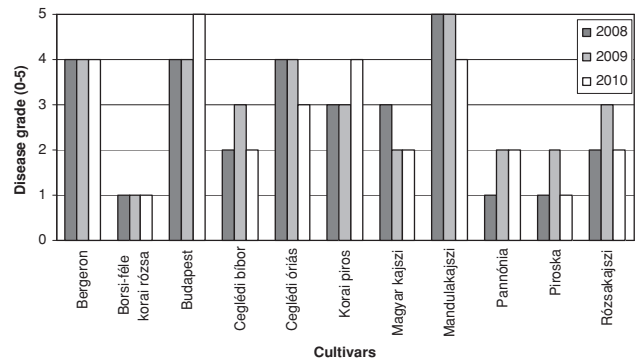


Figure 1: Susceptibility of fruit of apricot cultivars to *Monilinia* spp. (Kecskemét, 2008–2010)

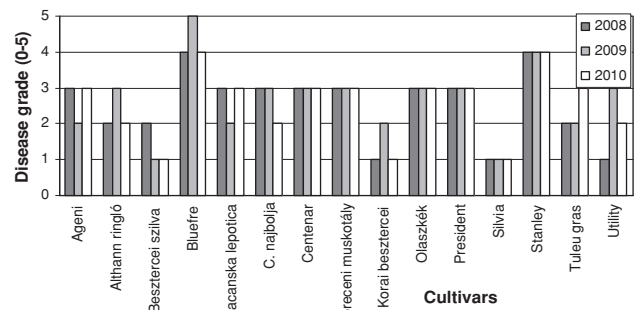


Figure 2: Susceptibility of fruit of plum cultivars to *Monilinia* spp. (Kecskemét, 2008–2010)

several European plum cultivars into brown rot susceptibility groups. He found that 'Bluefre' and 'Stanley' are highly, 'Cacanska najbolja' and 'President' are moderately, and 'Besztercei', 'Silvia' and 'Tuleu gras' are lowly susceptible to fruit rot caused by *M. laxa*. Similar to our study Szabó (1997a) classified apricot cultivars into brown rot susceptibility groups. He evaluated cvs. 'Budapest' and 'Mandulakajszi' as highly, 'Ceglédi óriás' as moderately and 'Piroska', 'Pannónia', 'Ceglédi bíorkajszi' and 'Magyar kajszi' as lowly susceptible to *M. laxa*.

Table 1: *Monilinia* spp. susceptibility classes of plum cultivars (Kecskemét, means of 2008–2010)

Low	Moderate	High
Silvia	Althann ringló	Ageni
	Besztercei szilva	Bluefre
	Tuleu gras	Cacanska leptotica
	Utility	C. najbolja
	Korai besztercei	Centenar
		Debreceni muskotály
		Olaszkék
		President
		Stanley

**Table 2:** *Monilinia* spp. susceptibility classes of apricot cultivars (Kecskemét, means of 2008–2010)

Low	Moderate	High
Borsi-féle korai rózsza	Magyar kajszai	Budapest
	Pannónia	Ceglédi bibor
	Piroska	Ceglédi óriás
	Rózsakajszai	Korai piros
		Mandulakajszai
		Bergeron

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