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INCIDENCE OF BACTERIAL DISEASE ON SOME APRICOT VARIETIES CULTIVATED IN BUCHAREST AREA

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Abstract

In the present study, the behaviour of some old and new apricot varieties, grown in an integrated orchard in Bucharest Area, is presented. The apricot orchard was planted in 2008 and in 2017using Romanian and foreign varieties grafted on Mirobolan, Myrobalan 29C, Saint Julien A and GF 677. The planting distances varied from 4.5 x 3.0 m to 3.5 x 2.0 m and several canopies were formed: Drapeau Marchand, Simple Palmette, Mikado, Parallel U and Trident. High concrete poles with 4 lines of wires, was made as trellis system for the trees planted in 2017. The land was maintained covered with a mixture of perennial grasses on the interrow and clean with herbicide on the row. Drip irrigation was applied for the 2008 orchard and micro sprinklers were used for the new orchard. Leaves were collected at the end of the growing season (late October) and the incidence of the bacterial disease was measured using a scanner and the WinFolia Software. In the same time the leaf are was measured. The results showed that the intensity of the bacterial attack was influenced by the variety, and surprisingly by the canopy.

Key words*: Armeniaca vulgaris, rootstocks, canopies, leaf area, frequency, attack intensity.*

INTRODUCTION

Bacterial spot caused by *Xanthomonas arboricola* pv. *Pruni* was described for the first time in the USA (Michigan) in 1903 on Japanese plum and is a serious disease that can affect apricot fruit quality and production worldwide.

In Romania is widespread in all fruit-growing areas on all stone-fruits. Due to the attack, significant damage was recorded in plum, peach or apricots through strong defoliation and fruit fall in varieties susceptible to the attack of this bacterium.

The disease is manifested on leaves, fruits, young shoots, branches and stems.

At leaves, appear from the first month, small circular or angular spots with a clear, translucent, green appearance, slightly darker than healthy tissue. At first, the spots appear around the stomata or are restricted to the tissues between the ribs. As a feature is that they are surrounded by a glassy and transparent area. They are often covered with an abundant, yellowish exudate.

In time, the tissue next to the spots will become necrotic, it will dry out, come off and fall and leaves remain drilled.

To a strong atack, the spots become joined together, are expanding especially at the edge of the leaves that will appear sharply. When spots appear on the petiole of the leaves, these will fall more and more.

Initially, on the fruit appear small brown spots, and then become blackish, circular with an aqueous appearance, spots that grow with the growth of the fruit.

These are found in the pulp of the fruit and have on their surface a yellow exudate, very rich in bacteria.

There are cases when on unripe fruits, you can fiind a dark green ring around the spots.

Instead of these spots, the fruit tissues react by glue secretion and by the appearance of a suber separator layer, that will separate the sick tissue from healthy tisuue. In time, the spots will become necrotic, will cracks.

The simptoms produced from the bacteria can be confunsed with the ones of the *Coryneum beijerin-ckii* Qud.

The difference is that the spots frum the leaves, produced by the fungus, are bigger, up to 3 mm in diameter, surrounded by a reddish-brown edge and the surface exudation is missing.

The spots from the fruits are more prominent and they are not covered by this exudate.

Leaves appear similar to those on the leaves and fruits with small differences. In front of these spots, the tissue will become necrotic, will crack and abundant glue leaks will occur, especially at the apricot and peach cultivars.
When the attack become powerful, the spots become expand, including the shell on certain portions.
This causes an interruption of the sew followed by bending and drying the top of the shell.
We can find the attack even on the branches and strain, looking like an open cancer, that becomes deeper in years. When it expands, the trees will dry.

MATERIALS AND METHODS

The apricots leaves were collected from the Experimental orchard of Faculty of Horticulture of USAMV Bucharest. The apricots varieties used were: 'Congat', 'Primando', 'Primaya', 'Rubista', 'Portici','Pisana', 'CMBU', 'Bergeron', 'Vitilo', 'Buccucco Liscia', 'Wonder Cot', 'Lady Cot', 'Delice', 'Lili Cot', 'Milord', 'Swired', 'Congat', 'Mikado', 'Lido', 'Med Flo', 'Flopria', 'Faralia', 'Farely', 'Fartoli', 'Farbali', 'Farbela', 'Anegat', 'Farlis', 'Farclo', 'San Castrese', 'Danubiu', 'Goldrich', 'Auras', 'Harcot', 'Dacia', 'Sweet Cot', 'Augustin', 'Fortuna', 'Cristal', 'Amiral', 'Olimp'.
In October, 2018 it was harvested 10 leaves of each tree, which were kept in the refrigerator at a temperature of 2°C and 85% humidity.
The observation was made for each tree and the leaves were analysed with *WinPholia* program, with whom the harvested leaves were scanned, photographed and then, the percentage of attack of bacteriosis was calculated. The leaves were scanned both individually and in groups (2-3 or even 10). For calculate the attack rate of the disease, the disease-specific colors for each leaf were selected as well as for the healthy foliar surface, in the end, the program calculate the damage degree. This indicator is represented by histogram type charts.
Statistical analyses were made using Anova test.

RESULTS AND DISCUSSIONS

The results showed that the 'CMBU' variety had the highest percentage of healthy foliar surface (Figure 4), the affected part being only 8.11%. At the opposite side, the variety 'Rubista' (Figure 2), with the most attacked surface, had a double percentage 19.37%, followed by the 'Primando' variety (Figure 3) with 18.36%.
The others varieties recorded values between 10.34% and 14.24% (Figure 1).

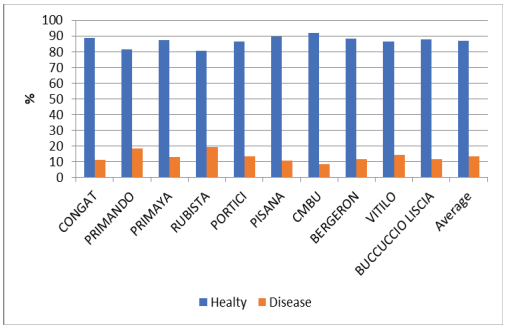

Figure 1. Comparison of bacterial disease attack on apricot varieties leaves

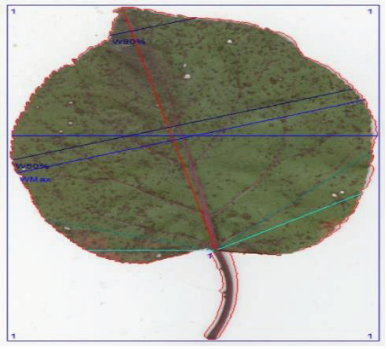

Figure 2. Symptoms of bacterial spot disease on a detached apricot leaf of 'Rubista' variety

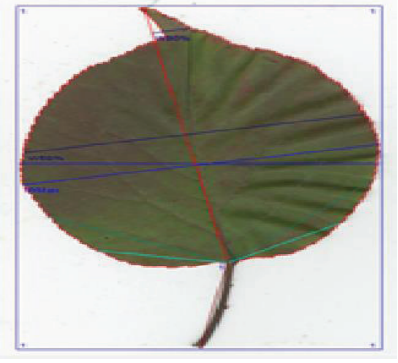

Figure 3. Symptoms of bacterial spot disease on a detached apricot leaf of 'Primando' variety

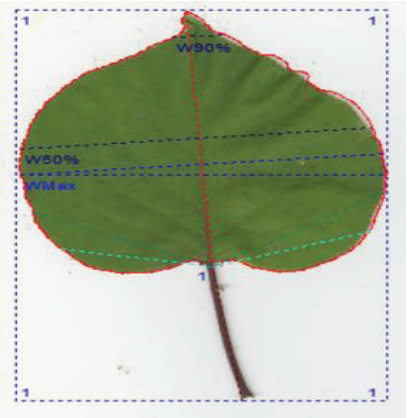

Figure 4. Symptoms of bacterial spot disease on a detached apricot leaf of 'CMBU' variety

The planting distance for 26 rows was 3.5 m x 2.0 m, the canopy was Bi-Baum, and the applied irrigation method being micro sprinklers.

The varieties on this row was: 'Wonder Cot', 'Lady Cot', 'Delice', 'Lili Cot', 'Milord', 'Swired', 'Congat', 'Mikado', 'Lido', 'Med Flo', 'Flopria'.

Under the condition of 2018, the 'Milord' variety (Figure 7) had the least attacked foliar surface with only 7.07%. On this row, the most attacked foliar surface was the variety 'Wonder Cot' (Figure 6) with 21.91% followed by 'Mikado' (Figure 8) with 21.06%. The percentages of attack of the other varieties reneged between 9.24% at 'Congat' and 19.50% at 'Med Flo' (Figure 5).

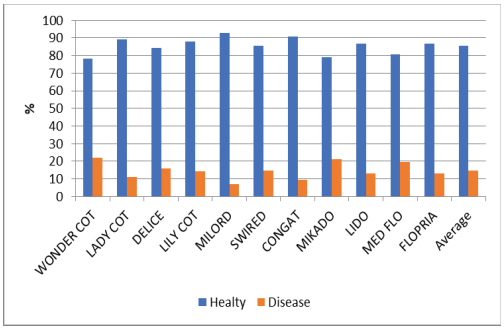

Figure 5. Comparison of bacterial disease attack on different apricot varieties (2018)

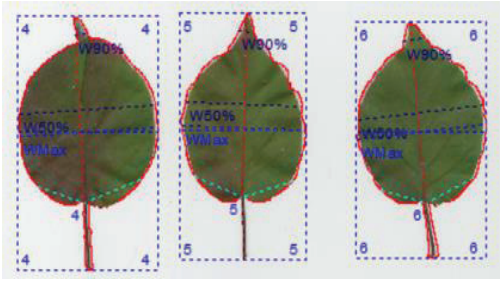

Figure 6. Symptoms of bacterial spot disease on apricot leaves of 'Wonder Cot'

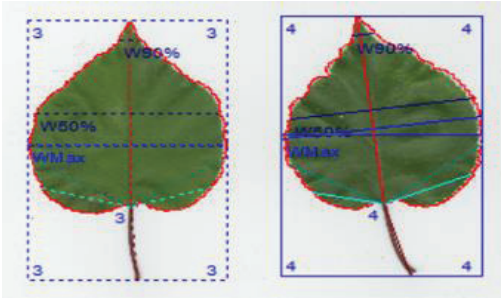

Figure 7 Symptoms of bacterial spot disease on detached apricot leaves of 'Mylord' variety

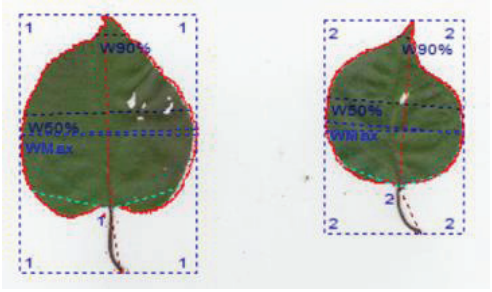

Figure 8. Symptoms of bacterial spot disease on detached apricot leaf of 'Mikado' variety

The row 27 as well as 26, the planting distance and irrigation form, are the same, the difference is that the canopy differs, on this we have Trident. As well as varieties on this row we have: 'Faralia', 'Farely', 'Fartoli', 'Farbali', 'Farbela', 'Anegat', 'Farlis', 'Farclo', 'Primaya'.

On this row, the 'Farbali' variety had the lowest percentage of the attack leaf, both in range and compared to the other varieties analysed, with only 4.98%. The highest values were recorded by the variety 'Farclo' grafted on Mirobolan 29C.

The values recorded by the remaining varieties ranged between 6.93% by the 'Fartoly' variety grafted on Saint Julien A and 13.93% by the 'Farclo' variety grafted by Saint Julien A. We have noticed that the differences between grafted varieties in different rootstocks, in this case, are not quite large (Figure 9).

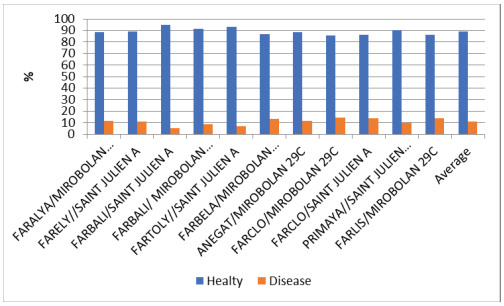

Figure 9. Comparison of bacterial disease attack on different apricot varieties grafted on Saint Julien A or Mirobolan 29C (2018).

Twelve old varieties have also been analysed and the results showed that the 'San Castrese' and 'Auras' variety, had the smallest values being amongst the most resistant to bacteriosis attack (Figure 10).

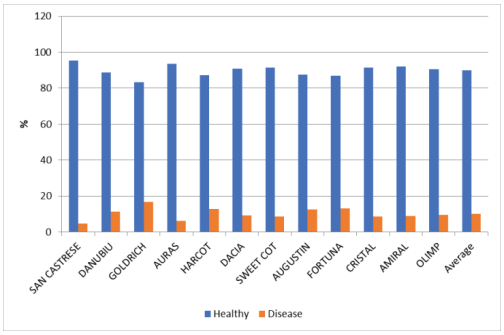

Figure 10. Comparison of bacterial disease attack on dome Romanian and foreign varieties of apricots (2019)

CONCLUSIONS

The most tolerant varieties on *Xanthomonas arboricola pv pruni* are 'San Castrese' and 'Farbali' grafted on Saint Julien A rootstock. 'Rubista', 'Primando' and 'Wonder Cot' shows sensitivity to bacterial attack and also 'Farclo' on Mirobolan 29C.

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