Available online at
www.proenvironment.ro

ProEnvironment

ProEnvironment 4 (2011) 87 - 91

Original Article

The Study of the Climatic Conditions Influence on the Attack Degree of Moniliosis and Red Stain in Plum, Function of Strain and Fertilizers

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Received 9 May 2011; received and revised form 20 May 2011; accepted 28 May 2011
Available online 1 June 2011

Abstract

Increasingly climate change, affects several sectors of agricultural production, one of the most important being the fruit. In this context, this paper is presented the study on the influence of climatic conditions on moniliozã attack shoots and red staining on leaves of plum and interaction: climate conditions - foliar fertilization, climatic conditions - variety, four varieties of plum (Stanley, Tuleu timpuriu, Anna Spath, Gras ameliorat) grown in the Somes Plateau, Calacea, County, three experimental years: 2007, 2008 and 2009. Regarding the interaction of climatic conditions - foliar fertilization was found that 2008 was the most favorable terms moniliozei attack on shoots, and variety in the degree of injury was highest (9.41%) is Stanley and lower in 2007 (6.43%). when in fact the values are significantly distinct from the average. If oncerning the shoots moniliosis attack we cannot make a statistical difference on the results it may be noted that the ranking of varieties behavior to moniliosis attack under the application of foliar fertilizationled to the following results: Anna Späth ranks first (7.47 %), then follows Tuleu timpuriu (7.54%), Stanley (7.83%) and Gras ameliorat (7.96%). Polystigma rubrum plant pathogen was observed in maximum values of all the experimental conditions in 2008, the degree of attack on the leaves reaching values of 5.71%. The variety most resistant to staining red leaf plum (*Polystigma rubrum*) proved to be kind Stanley while the lowest sensitivity of a variety registered variety Anna Späth.

Keywords: foliar ferilizer malady, *Monilinia spp., Polystigma rubrum*

1. Introduction

In Romania, plum encounters favorable climatic conditions and grows differently, on considerable area. Food value of fruits and industrial interest justifies social - economic and cultural modernization and recovery technologies. For this reason, great importance in the practice of culture has control of diseases of this species. The most common are moniliosis caused by *Monilinia spp* and red staining produced by *Polystigma rubrum* [2].

In the current context of climate change more evident in the Somes Plateau, it is necessary to address the increasing complexity of issues related to management problems caused by major diseases of plum. This can be done by integrating climatic conditions as a factor of importance in developing strategies for major virtual reduction of the attack, along with more traditional approaches that highlight the importance of fertilization in the global economy of the major challenges that continue to confront specialists in the field.

In plum, the main target is the Monilinia spp buds of plum shoots, while leaves are targeted for Polystigma specfică rubrum [4, 5].

Because of the weight spectrum red staining moniliozei and general diseases which attacks plum

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is susceptible in this study we aimed moniliozei impact assessment on the shoots and red staining on leaves from plum, during three experimental years (2007 - 2009) in Calacea area, County, in the context of climate and application of foliar fertilization [3, 6, 7].

2.Material and Method

The experiment was conducted in the experimental field Calacea in an orchard with an area of 30 hectares, located in West County, 470 15 'north latitude and 230 43' east longitude, fits in the Somes Plateau fruit growing region. Planting density was 500 trees per hectare. Varieties were used: Stanley, early haulm, Anna Späth and improved Gras, and foliar fertilizers were administered: Nutri Leaf, Ferticare and Calmax. Statistical processing was achieved by Duncan test. The influence of the climate on moniliosis and red staining attack, was emphasized through the following interactions: climatic conditions - foliar fertilization, climatic conditions - variety [1].

3.Results and Discussions

Analyzing the data presented in Table 1 it can be said that in terms of degree of attack moniliozei, in terms most favorable climate year was 2009 with very significant statistical difference from the average negative value of the degree of 6.52% attack. The worst year was 2008 where the value of the degree of attack was 9.01% recorded a very significant statistical difference positive. In 2007 there were significant differences. Similarly if the attack on the leaf plum red staining, it is clear that the degree of attack of the disease was influenced by different climatic conditions. Thus, in 2009 registered the lowest attack 4.87%, followed by 5.55% in 2007 and 2008 with a grade of 6.71% attack.

Table 1. The influence of the climatic conditions on moniliosis (*Monilinia spp*.), on plum shoots, Călacea, county of Sălaj (2007 - 2009)

No. crt.	Year	Attack degree	% against control	Difference against contrrol	Significance of difference	Duncan test
			Moniliosis			
1.	2007-2009	7.70	100.0	0.00	Mt.	-
2.	2007	7.58	98.4	-0.12	-	B
3.	2008	9.01	117.0	1.31	***	C
4.	2009	6.52	84.6	-1.18	000	A
		DL (p 5%) = 0,21	DL (p 1%) = 0,34	DL (p 0.1%) = 0,64		
			Red staining			
1.	2007-2009	5.71	100.0	0.00	Mt.	-
2.	2007	5.55	97.2	-0.16	-	AB
3.	2008	6.71	117.5	1.00	*	B
4.	2009	4.87	85.3	-0.84	0	A
		DL (p 5%) = 0.70	DL (p 1%) = 1.16	DL (p 0.1%) = 2.18		

The results in this study (Tables 2 and 3) shows that in both attack monilioza (Monilinia spp) on shoots and leaves of red staining (Polystigma rubrum) foliar fertilizers can have a positive or negative influence on moniliozã attack depending on climatic conditions, similar data from the literature that the composition of fertilizers and especially fertilization may have stimulating effect on how the main manifestation of the disease and horticultural crops [3, 7].

In 2008, notes that the three foliar fertilizer (Nutri Leaf, Ferticare and Calmax) differences from the average of the years (2007-2009) were significantly positive, while in 2009 was a very significant negative. In 2007 there were no significant differences compared with controls [1].

Given these data and coroborându them with climatic factors, it can be said that the year most favorable for the manifestation of the shoots moniliozei (Monilinia spp) when foliar fertilization with Nutri Leaf, Ferticare and Calmax was 2009.

The data presented in Table 3 show that the variant treated with Ferticare degree of attack was the lowest 5.47%, followed by the variant treated with 5.80% and Nutri Leaf Calmax treated with a degree of attack 5.85%.

Table 2. The effect of the interactions between climatic conditions and foliar fertilizing on plum shoots, Călacea, county of Sălaj (2007 - 2009)

Fertilizer	Year	Attack degree	% against control	Difference against contrrol	Significance of difference	Duncan test
	2007-2009	**7.52**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.44	98.8	-0.09	-	B
Nutri leaf	2008	8.77	116.6	1.25	***	C
	2009	6.36	84.5	-1.16	000	A
	DL (p 5%) = 0.51		DL (p 1%) = 0.73		DL (p 0.1%) = 1.09	
	2007-2009	**7.74**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.65	98.9	-0.09	-	B
Ferticare	2008	8.97	116.0	1.24	***	C
	2009	6.59	85.1	-1.15	000	A
	DL (p 5%) = 0.51		DL (p 1%) = 0.73		DL (p 0.1%) = 1.09	
	2007-2009	**7.84**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.65	97.5	-0.19	-	B
Calmax	2008	9.28	118.3	1.43	***	C
	2009	6.60	84.2	-1.24	000	A
	DL (p 5%) = 0.51		DL (p 1%) = 0.73		DL (p 0.1%) = 1.09	
	2007-2009	**7.70**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.58	98.4	-0.12	-	B
Media	2008	9.01	117.0	1.31	-	C
	2009	6.52	84.6	-1.18	-	A
	DL (p 5%) = 0.33		DL (p 1%) = 0.47		DL (p 0.1%) = 066	

Tabelul 3. The effect of the interactions between climatic conditions and foliar fertilizing on red staing attack (*Polystigma rubrum*), on plum leaves, Călacea, county of Sălaj (2007 - 2009)

Fertilizer	Year	Attack degree	% against control	Difference against contrrol	Significance of difference	Duncan test
	2007-2009	**5.80**	**100.0**	**0.00**	**Mt.**	**-**
	2007	5.72	98.5	-0.09	-	D
Nutri leaf	2008	6.77	116.7	0.97	*	E
	2009	4.92	84.8	-0.88	0	B
	DL (p 5%) = 0.75		DL (p 1%) = 1.21		DL (p 0.1%) = 2.19	
	2007-2009	**5.47**	**100.0**	**0.00**	**Mt.**	**-**
	2007	5.29	96.7	-0.18	-	C
Ferticare	2008	6.56	119.8	1.08	*	E
	2009	4.57	83.5	-0.90	0	A
	DL (p 5%) = 0.75		DL (p 1%) = 1.21		DL (p 0.1%) = 2.19	
	2007-2009	**5.85**	**100.0**	**0.00**	**Mt.**	**-**
	2007	5.64	96.4	-0.21	-	D
Calmax	2008	6.80	116.2	0.95	*	E
	2009	5.11	87.3	-0.74	-	BC
	DL (p 5%) = 0.75		DL (p 1%) = 1.21		DL (p 0.1%) = 2.19	
	2007-2009	**5.71**	**100.0**	**0.00**	**Mt.**	**-**
	2007	5.55	97.2	-0.16	-	AB
Media	2008	6.71	117.5	1.00	*	B
	2009	4.87	85.3	-0.84	0	A
	DL (p 5%) = 0.70		DL (p 1%) = 1.16		DL (p 0.1%) = 2.18	

The variant treated with Nutri Leaf best results were recorded in 2009 with a degree of attack 4.92% (significantly negative difference), followed by the version of 2007 with 5.72%. The highest degree of attack was found in 2008 (6.77%), the difference recorded being significantly positive. If moniliozei attack (Monilinia spp), this study showed (Table 4) the influence of climatic factors on the behavior of varieties. Highest degree of attack was in 2008. Examining the interaction variety x climatic conditions in Table 5, we can see that in 2007 and 2009 in all four varieties showed no differences compared to the control, while in 2008 the difference was significant.

Tabelul 5. The interaction strain x climatic conditions on moniliosis (*Monilinia spp*.), on plum shoots, Călacea, county of Sălaj (2007 - 2009)

Strain	Year	Attack degree	% against control	Difference against contrrol	Significance of difference	Duncan test
	2007-2009	**7.47**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.42	99.4	-0.05	-	B
Ana Spath	2008	8.42	112.7	0.95	**	C
	2009	6.57	87.9	-0.90	00	A
	DL (p 5%) = 0.63		DL (p 1%) = 0.86		DL (0.1%) = 1.16	
	2007-2009	**7.96**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.81	98.1	-0.15	-	B
Gras ameliorat	2008	9.45	118.6	1.48	***	C
	2009	6.62	83.2	-1.34	000	A
	DL (p 5%) = 0.63		DL (p 1%) = 0.86		DL (0.1%) = 1.16	
	2007-2009	**7.83**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.66	97.8	-0.18	-	B
Stanley	2008	9.41	120.1	1.58	***	C
	2009	6.43	82.1	-1.40	000	A
	DL (p 5%) = 0.63		DL (p 1%) = 0.86		DL (0.1%) = 1.16	
	2007-2009	**7.54**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.42	98.4	-0.12	-	B
Tuleu timpuriu	2008	8.76	116.2	1.22	***	C
	2009	6.44	85.4	-1.10	00	A
	DL (p 5%) = 0.63		DL (p 1%) = 0.86		DL (0.1%) = 1.16	
	2007-2009	**7.70**	**100.0**	**0.00**	**Mt.**	**-**
	2007	7.58	98.4	-0.12	-	B
MEDIA	2008	9.01	117.0	1.31	***	C
	2009	6.52	84.6	-1.18	000	A
	DL (p 5%) = 0.21		DL (p 1%) = 0.34		DL (0.1%) = 064	

Table 5. The interaction strain x climatic conditions on red staing attack (*Polystigma rubrum*), on plum leaves on moniliosis (*Monilinia spp*.), on plum shoots, Călacea, county of Sălaj (2007 - 2009)

Strain	Year	Attack degree	% against control	Difference against contrrol	Significance of difference	Duncan test
	2007-2009	**6.87**	**100.0**	**0.00**	**Mt.**	**-**
	2007	6.72	97.8	-0.15	-	EF
Ana Spath	2008	7.92	115.3	1.05	*	G
	2009	5.97	86.9	-0.90	-	DE
	DL (p 5%) = 0.92		DL (p 1%) = 1.37		DL (p 0.1%) = 2.21	
	2007-2009	**6.15**	**100.0**	**0.00**	**Mt.**	**-**
	2007	5.94	96.7	-0.21	-	D
Gras ameliorat	2008	7.08	115.1	0.93	*	F
	2009	5.42	88.2	-0.73	-	CD
	DL (p 5%) = 0.92		DL (p 1%) = 1.37		DL (p 0.1%) = 2.21	
	2007-2009	**4.57**	**100.0**	**0.00**	**Mt.**	**-**
	2007	4.43	96.9	-0.14	-	B
Stanley	2008	5.63	123.1	1.05	*	CD
	2009	3.66	80.0	-0.91	-	A
	DL (p 5%) = 0.92		DL (p 1%) = 1.37		DL (p 0.1%) = 2.21	
	2007-2009	**5.24**	**100.0**	**0.00**	**Mt.**	**-**
	2007	5.11	97.4	-0.14	-	BC
Tuleu timpuriu	2008	6.21	118.4	0.97	*	DE
	2009	4.42	84.2	-0.83	-	B
	DL (p 5%) = 0.92		DL (p 1%) = 1.37		DL (p 0.1%) = 2.21	
	2007-2009	**5.71**	**100.0**	**0.00**	**Mt.**	**-**
	2007	5.55	97.2	-0.16	-	AB
MEDIA	2008	6.71	117.5	1.00	*	B
	2009	4.87	85.3	-0.84	0	A
	DL (p 5%) = 0.70		DL (p 1%) = 1.16		DL (p 0.1%) = 2.18	

Analyzing the average of the four varieties of plum in the three years of experience, it shows that in 2009 the difference was significantly negative, and in 2008 the difference was significant. In 2007 there was differences.

4,Conclusions

On the emergence, evolution and manifestation of moniliosis (*Monilinia* spp), 2008 was most favorable in terms of attack on shoots. It is noted that in 2008 the variety Stanley had the highest degree of attack (12.59%) and lowest in 2007 (9.02%), when in fact the values are significantly distinct from the average.

If the moniliosis attack on shoots can not make a statistical difference on the results of the moniliosis attack but it may be noted that the ranking of varieties behavior to moniliosis attack under the application of foliar fertilization led to following results: Anna Späth ranks first (7.47 %), followed by Tuleu timpuriu (7.54%) Stanley (7.83%) and Gras ameliorat (7.96%).

Polystigma rubrum plant pathogen was observed in maximum values of all the experimental conditions in 2008, the degree of attack on the leaves reaching up to 25.67% values.

The variety most resistant to red staining (*Polystigma rubrum*) attack on leaf plum proved to be Stanley while the lowest sensitivity of a variety registered variety Anna Späth. results achieving the lowest level of 5.47% attack.Of fertilizers, Ferticare is the product that led to the best

References

[1] Ardelean M., 2005, Principii ale metodologiei cercetării agronomice şi medical veterinare. Editura AcademicPres, Cluj – Napoca

[2] Florian V., 2001, Fitopatologie generală. Editura Poliam, Cluj-Napoca

[3] Florian V., I. Oroian, 2002, Diagnoza bolilor infecţioase la plantele de cultură. Editura Poliam, Cluj – Napoca

[4] Puia Carmen, V. Florian, I. Oroian, 2003, Fitopatologie. Ghid practic., Editura Digital Data, Cluj-Napoca

[5] Puia Carmen, 2005, Fitopatologie, Patografie, Etiologie. Editura Risoprint, Cluj-Napoca

[6] Oroian I., V. Florian, L. Holonec, 2006, Atlas de fitopatologie. Editura Academiei Române, Bucureşti

[7] Pârvu M.. 2000. Ghid practic de Fitopatologie. Editura Presa Universitară Clujană. Cluj – Napoca