Behavior of Some Greenhouse Grown Tomato Hybrids on Pathogens Attack

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BulletinUASVM Horticulture 72(1) / 2015

Print ISSN 1843-5254, Electronic ISSN 1843-5394

DOI:10.15835/buasvmcn-hort:10513

ABSTRACT

In Romania, the most important pathogens on tomatoes crops are: *Fusarium oxysporum* f.sp. *lycopersici*, *Verticillium dahliae*, *Alternaria porri* f.sp. *solani*, *Botrytis cinerea*, *Fulvia fulva*, *Erysiphe* sp., *Phytophthora infestans* etc. The research aimed to study the behavior of some hybrids: Klass F1, Venezia F1, Benatar F1, Buran F1, Hunk F1, Rugby F1, Prekos F1 and Siriana F1 (control variant) grown in the greenhouse to the attack of the most important pathogens in order to establish if they are resistant/ tolerant. High tolerance to *Alternaria porri* f.sp. *solani* have the cultivars Hunk F1 (3.3%), Buran (3.9%), Benatar F1 (4.5%), Siriana F1 (3.7%) and Klass F1 (4.9%). High tolerance to *Botrytis cinerea* have Venezia F1 (6.9%), Buran F1 (7.1%), Hunk F1 (8.2%), Klass F1 (9.3%) and Siriana F1 (10.2%). Resistant to *Fulvia fulva* attack are Benatar F1 and Buran F1 (no attack) and high tolerance present Hunk F1 (5.3%) and Siriana F1 (7.8%). The most sensible cultivars with high severity of attack on leaves to *Alternaria solani* (32.9–34.7%), *Botrytis cinerea* (27.5–25.2%) and *Fulvia fulva* (38.7–40.8%) are Rugby F1 and Prekos F1. Using the hybrids Buran F1, Benatar F1, Klass F1, Hunk F1 and Siriana F1 the numbers of chemical applications during the growing period can be reduced.

Keywords: greenhouses, hybrids, pathogens, tomato

INTRODUCTION

In the greenhouse good environmental factors for the growth and development of tomato plants are in the same time favorable for the appearance and evolution of pathogens attack. In Romania, the most important pathogens of tomato crops (Costache, 2007) are both soil borne pathogens as *Fusarium oxysporum* f.sp. *lycopersici* (Fusarium wilt) respectively *Verticillium dahliae* (Verticillium wilt) and pathogens which attack the aerial part of the plants (leaves, stems, fruits) as *Alternaria porri* f.sp. *solani* (early blight), *Botrytis cinerea* (grey mold), *Fulvia fulva* (leaf mold), *Erysiphe* sp. (powdery mildew), *Phytophthora infestans* (late blight) etc. For the registration of tomato cultivars, disease resistance is evaluated against *Fusarium oxysporum* f. sp. *lycopersici* race 0 and 1 (FOL0 and FOL1), *Verticillium dahliae*, Tomato mosaic virus race 0 and *Meloydogine incognita* (Sigillo and Bravi, 2011). All *Alternaria* diseases are characterized by a short period of susceptibility

in seedlings, a long period of resistance in young to intermediate -aged plant and increasing susceptibility in aging plant (Rotem, 1994). Sources of genetic resistance have been identified within tomato related wild species, in particular green-fruited *L. hirsutum* and red-fruited *L. pimpinellifolium* (Foolad, 2005). Resistant cultivars at *Botrytis cinerea* are not present (Heyens *et al.*, 2011) and the solutions are sanitation, cultural measures and chemical control. Varieties with major gene resistance to foliar fungal pathogens such as gray leaf spot and *Cladosporium* leaf mold (two genes usually used) are common, while a few varieties have resistance to some races of late blight (Scott, 2005).

AIMS AND OBJECTIVES

The research aimed to study the behavior of some hybrids grown in the greenhouse to the attack of the most important pathogens in order to establish if they are resistant/tolerant.

Tab.1 Behavior of some tomato hybrids, growing in greenhouses, at pathogens attack

No.crt.	Hybrid	Severity of attack (%) on leaves			Yield kg/plant
		<i>Alternaria solani</i>	<i>Botrytis cinerea</i>	<i>Fulvia fulva</i>	
1	Klass F1	4.9	9.3 ⁰	15.9 ^{xxx}	6.32 ^{xxx}
2	Venezia F1	10.5 ^{xxx}	6.9 ⁰⁰⁰	13.8 ^{xxx}	5.85 ^{xxx}
3	Benatar F1	4.5	8.7 ⁰⁰⁰	0 ⁰⁰⁰	5.55 ^{xxx}
4	Buran F1	3.9	7.1 ⁰⁰⁰	0 ⁰⁰⁰	5.80 ^{xxx}
5	Hunk F1	3.3 ⁰⁰	8.2 ⁰⁰⁰	5.3 ⁰⁰⁰	4.81 ^{xxx}
6	Rugby F1	32.9 ^{xxx}	27.5 ^{xxx}	38.7 ^{xxx}	3.67 ⁰⁰⁰
7	Prekos F1	34.7 ^{xxx}	25.2 ^{xxx}	40.8 ^{xxx}	3.55 ⁰⁰⁰
8	Siriana F1 (Ct)	4.7	10.2	7.8	4.55
LSD 5%		0.87	0.68	0.79	0.10
LSD 1%		1.18	0.93	1.07	0.14
LSD 0.1%		1.60	1.26	1.45	0.19

Concerning the yield the best results were obtained with cultivars Klass F1 (6.32 kg/plant), Venezia F1 (5.85 kg/plant), Buran F1 (5.80 kg/plant) and Benatar F1 (5.55 kg/plant).

MATERIAL AND METHODS

The studied biologic material was represented by 8 tomato cultivars: Klass F1, Venezia F1, Benatar F1, Buran F1, Hunk F1, Siriana F1, Rugby F1 and Prekos F1. The control variant was represented by cultivar Siriana F1. Planting date was April 20, 2013 and planting density 27,500 pl·ha⁻¹.

During vegetation period observations in dynamics regarding incidence and severity of attack were done.

RESULTS AND DISCUSSION

Regarding the resistance of cultivars to the different pathogens present in our country (Tab. 1) the following results were obtained:

- all studied hybrids are resistant to *Fusarium oxysporum* f.sp. *lycopersici*, race 0 (Fol, 0) and *Verticillium dahliae*, race 1 (Vd, 1). - high tolerance to *Alternaria porri* f.sp. *solani* have the cultivars Hunk F1 (3.3%), Buran (3.9%), Benatar F1 (4.5%), Siriana F1 (3.7%) and Klass F1 (4.9%).
- high tolerance to *Botrytis cinerea* have Venezia F1 (6.9%), Buran F1 (7.1%), Hunk F1 (8.2%), Klass F1 (9.3%) and Siriana F1 (10.2%).
- resistant to *Fulvia fulva* attack are Benatar F1 and Buran F1 (no attack) and high tolerance present Hunk F1 (5.3%) and Siriana F1 (7.8%).
- the most sensible cultivars with high severity of attack on leaves to *Alternaria solani* (32.9–34.7%), *Botrytis cinerea* (27.5–25.2%) and

Fulvia fulva (38.7–40.8%) are Rugby F1 and Prekos F1.

CONCLUSIONS

The best results were obtained with the tomato hybrids Benatar F1 and Buran F1 with high tolerance to the main pathogens *Alternaria solani*, *Botrytis cinerea* and *Fulvia fulva* and very good yield. Good results were also obtained with the Romanian cultivar Siriana F1 with high tolerance to *Alternaria solani*, *Botrytis cinerea* and *Fulvia fulva* and good yield. The most sensible to the *Alternaria solani*, *Botrytis cinerea* and *Fulvia fulva* were Prekos F1 and Rugby F1.

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