
MONITORING RUSTS OCCURENCE IN GRASSES VARIETIES

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ABSTRACT

The aim of study was right diagnostics individual species *r. Puccinia* at choice grasses varieties in field and laboratory conditions and evaluation impact act on their intensity occurrence. Experiment was pursued in cooperation with breeding station Větrov. Sample affected plant were took in specific terms in biennial monitoring (2011 and 2012), which were evaluated microscopic.

High incidence stem rust and crown rust was on test species in 2011 and 2012. Stem rust was found in 379 case of total number 514 accomplished by test, while crown rust was found in 40 case. Occurence both species rust was found currently at 95 pattern and rust were not discovered on remaining plant.

Key words: stem rust, crown rust, grasses varieties

INTRODUCTION

Crop breeding for resistance has got great importance in protecting against diseases and pests. Great success has been achieved with only random choice, but also purposeful breeding associated with thorough genetic and phytopathology analysis of the material or provocation tests and artificial infections. Increase resistance against harmful agent is today's breeding aim (Hanzalová et al., 2008). Diagnostics and measurement intensity disease play crucial role in the phytopathology. Study epidemiology and estimate losses on crop yield would not have been possible without quantification disease (Věchet, 2009).

The aim of the study was to determine the accurate diagnosis of individual types of *Puccinia* in selected turf species grass in the field and laboratory conditions. For this work were selected grass species, breeding for breeding station Větrov for lawn purposes (*Lolium perenne*, *Festuca rubra*, *Festuca ovina*, *Festuca arundinacea* and *Deschampsia caespitosa* and was monitored occurrence two pathogens – stem rust (*Puccinia graminis*) and rust coronata (*Puccinia coronata*). Selection for resistance to rust carry out already long time on the breeding station Větrov, therefore I established cooperation with station.

MATERIAL AND METHODS

Characteristic experimental station

Breeding station Větrov is in district Tábor. Locality Skalnice and locality Za Borovičkem find in potato - oat production area. Altitude locality Skalnice is 600 m a. s. l. Skalnice has got soil species light, soil type is sandy. Area Za Borovičkem find in altitude 630 m.n.m. Area Za Borovičkem have got soil species light and soil type sandy loam. Soil has got acid figure pH = 5. Stock nutrient is P 195 mg. kg⁻¹ very high, K 186 mg. kg⁻¹ (good), Mg 82 mg.kg⁻¹ (low), Ca 1240 mg. kg⁻¹ (satisfactory). Before crop was *Phacelia tanacetifolia* on both locality in year 2011 and before crop was *Avena*. Herbicide Dominátor was applied in both years ago planting and Stomp applied after planting on September 2011 and 2012.

Sampling

Samples grass varieties were removed during the vegetative period on breeding station Větrov. Plants were taken with symptoms infestation rust. I put samples in paper bags and I marked paper bags (description species, number plant, place and date taking). Material were dried and used diagnostic species pathogen. Samples were removed in irregular intervals.

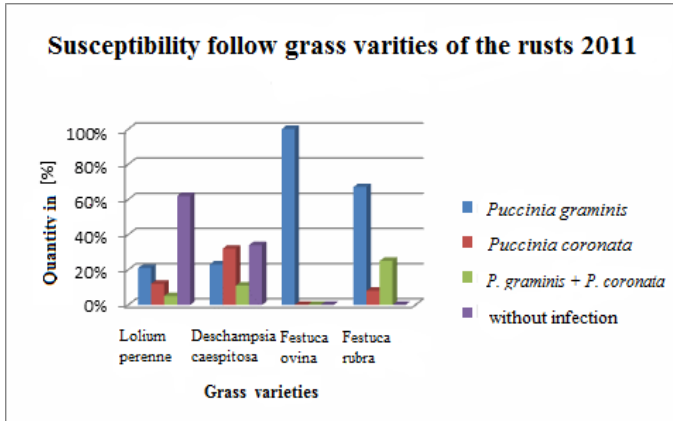
Microscopic diagnosis

Microscopic diagnosis was used destination pathogen. Drop of immersion oil was applied on the preparation and sample was observed at the highest microscope magnification (100 x). Preparation was marked number, which match number sample.

RESULTS AND DISCUSSION

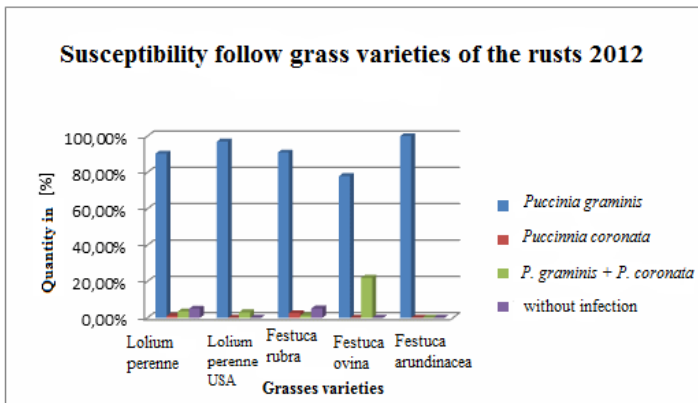
514 samples grass with symptoms infestation rust were removed in field conditions in years 2011 and 2012 (182 samples 2011, 319 samples 2012). Stem rust was found in 379 samples. Crown rust was in 40 samples and combined infection was in 95 samples.

Fig. 1 Susceptibility follow grasses varieties of the rusts 2011



Lolium perenne had got the most samples without infection on August 2011. Stem rust predominated from infected materials. Samples without infection occurred at *Deschampsia caespitosa* on August 2011. Crown rust the most occurred at *Lolium perenne* and *Deschampsia caespitosa* on September 2011. *Festuca ovina* was without infection on September 2011. Samples *Festuca rubra* were occurred combined infection on September 2011. Roscher et al. (2007) present, that both pathogens produce sporangia visible in late summer and on Autumn. Braun (1982) present, that stem rust and crown rust belong between common pathogens *Lolium perenne*. Věchet (2008) present, that stem rust is exacting on temperature and optimum for infection is + 15 – 20 °C. Cagaš (2001) present, that strong occurrence rust is conscious yearly on Autumn after seed harvest.

Fig. 2 Susceptibility follow grasses varieties of the rusts 2012



Samples without infection the most were at *Festuca rubra* on June 2012 and stem rust discovered at infection materials. *Lolium perenne* was the most occurred stem rust on June and August 2012. Intensity infestation stem rust and crown rust was low at *Festuca rubra* on August 2012. Intensity

infestation stem rust was 85% at *Lolium perenne* on September 2012 and crown rust occurred least (10%). Intensity infestation stem rust and crown rust was low at *Festuca rubra* on September 2012. I deduced, that *Festuca rubra* is more resistant than *Lolium perenne* according to intensity infestation. *Festuca rubra* was occurred stem rust on September 2012. Stem rust discovered at *Festuca ovina* on August 2012 and combined infection occurred on September 2012. All samples *Festuca arundinacea* were occurred stem rust. All samples *Lolium perenne* USA were infected stem rust on August. Cagaš (2007) present, that rust cause economic harmful for seed covers primarily at *Lolium perenne*. Schubiger et al. (2010) followed occurrence rust on *Lolium perenne* in Italy and he discovered, that first occurrence was watched already on June, but occurrence was common on August. Alternating weather support development spread diseases (Bartoš, 1986). Thermal optimum has got stem rust to infection + 15 - 20 °C (Hanzalová et al., 2008).

CONCLUSIONS

The results turf experiment in 2011 and 2012 show, that pattern were infected most stem rust at 60 case in year 2011 and 2012. Crown rust find in year 2011 in 34 case and in year 2012 in 6 case. Combined infection was at 88 case in 2011 and in 2012 at 7 case. Pattern without infection occurred at *Lolium perenne* in 2011 and pattern were infect stem rust most. *Lolium perenne* of locality Skalnice was strongly infected stem rust than *Lolium perenne* of locality Za Borovičkem. *Deschampsia cespitosa* was infected frequent crown rust in 2011. Stem rust find at *Festuca ovina* in both years. *Festuca rubra* had combined infection in 2011 and more pattern were without infection in 2012. Stem rust begin develop in both assess years before than crown rust. Occurrence crown rust was distinctively lower in 2012, than in year 2011. Difference between years could be caused different course weather in both years. Temperatures decided reduction at the end years in 2012, when crown rust didn't have suitable conditions for germination, therefore with at pattern show minimal. Other purchase were not realize due to rainy weather and low temperature on October 2012. Decided difference were make in resistance similar material grow on various field. Decided difference suit about distinctive effect microclimatic condition and probably about influence different infectious pressure for individual land (influence neighbouring growth etc.).

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