

Brown leaf rust in wheat

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It is caused by *Puccinia recondita*. The conditions in Bulgaria are extremely favourable for the causal agents of the disease, which is widespread in our country. It develops every year, especially under intensive rainfall and warm days (20-25°C), but in some years it appears epiphytotically and causes major losses.

Brown rust (leaf rust, Leaf Rust) in wheat develops almost every year in our country to a greater or lesser extent, and therefore has significant economic importance. Unlike stem rust and yellow rust, the damage it causes is relatively low, but it occurs annually. Yield losses are most often up to 10%, but can reach 30% under conditions favourable for the development of the pathogen. Even the slightest infestation of brown rust on the wheat plant affects the number of grains per ear and their thousand kernel weight. The greatest losses are observed when

the disease affects the flag leaf and the leaf below the flag leaf of the plants. In case of relatively early occurrence and strong development, the plants lag in growth, tiller less and form smaller ears, and the grain is of reduced quality.

Symptoms of brown rust are observed on the leaves and leaf sheaths from emergence until the end of the growing season, but not on the stem and spikelets. On the leaves, mainly on the upper side, small sori are formed, brown to rusty brown in colour, unevenly scattered over their surface, whose size does not exceed 1-2 mm. Around the sori, depending on the susceptibility of the variety, a wider or narrower chlorotic halo appears. Under severe brown rust infestation the leaf curls around the main vein and then dries out. Towards the end of the growing season, small, black, shiny teliospores are formed on the lower side of the leaves and on the leaf sheath.

Heavy nitrogen fertilization and cultivation of susceptible varieties may lead to earlier spring occurrence and spread of the disease, but usually mass infestation begins after ear emergence, with late-ripening varieties being more severely affected. The critical period for the plants is from the appearance of the flag leaf to the end of flowering and especially from the appearance of the first awn to full ear emergence.

Control:

Organizational, economic and agrotechnical measures for the control of brown rust include:

Use of resistant varieties. The varieties of the Dobrudzha Agricultural Institute possess different degrees of resistance to the pathogen. The manifestation of the disease in individual years is related to the population dynamics of the pathogen, i.e. the race diversity in different years;

Optimal sowing rates and balanced fertilization. High sowing rates, combined with excessive nitrogen fertilization, increase the susceptibility of plants and lead to denser stands and therefore to longer retention of moisture;

Timely destruction of volunteer plants, on which the pathogen successfully overwinters.

Chemical control:

Among chemical means, fungicides registered against the disease can be used, most of which are also registered against yellow rust, early leaf blight, fusarium head blight, powdery mildew: Aviator Xpro – 80-125 ml/da, Acanto 250 SC – 60 ml/da, Acanto Plus – 50-75 ml/da, Credo 600 SC – 150 ml/da, Allegro – 50 ml/da,

Amistar 25 SC – 60-80 ml/da, Amistar Extra SC – 70 ml/da, Diamant Max – 120-150 ml/da, Capalo – 100 ml/da, Tango Super – 80 ml/da, Prosaro 250 EC – 100 ml/da, Soligor 425 EC – 70 ml/da, Impact 25 SC – 50 ml/da, Sfera Max SC – 30-50 ml/da, Cherokee SE – 200 ml/da, Riza 25 EW – 50 ml/da, Tesoro 250 – 100 ml/da, Soprano 125 SC – 100 ml/da, Synstar – 70-80 ml/da, Sielex – 80 ml/da or 100 ml/da or 133 ml/da (the dose is determined depending on the degree of infestation), Mirador Forte 160 EC – 125 ml/da, Custodia – 100/125 ml/da, Comrade – 80/100 ml/da, Magnello EC – 100 ml/da, Rubric 125 SC – 100 ml/da, Osiris – 200-300 ml/da, Ricali – 100 ml/da.