drograms (mean taxonomic distance, UPGMA), irrespective of their changes caused by experimental stress. In the dendrogram (Fig. 15), three groups of grasses, namely the amphiploids, *H. vulgare*, and *B. secalinus*, are distinctly separated. Appriopriate pairs (s vs. z) also are distinctly separated. Only the AGA amphiploid is differentiated more by the environmental stress. Development of the abaxial epidermis of palea and lemma was most often disturbed in amphiploids. Under drought conditions, high temperature, and starvation, the grass plant developed only one tiller with short spike or poor panicle. Tissues were highly sclerified. Under sufficient watering, the plants were often infested by fungi and setting of caryopses was defective. In conclusion, both environments can create a stress of various nature. Thus, the microstructure of cereals is shifted under heavy stress, but its general pattern is preserved. Then, this pattern can be a good basis for any taxonomic comparisons.

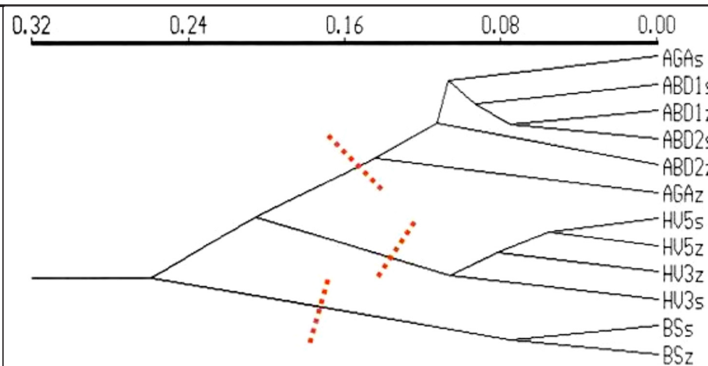

Fig. 15. A dendrogram (Canberra distance, UPGMA) of cereal OTUs described by glumellae and lodicule microstructure (*Triticum* amphiploids having genomes AAGGAA (AGA) and AABBDD (ABD1 and ABD2), and two cultivars of *Hordeum vulgare* (HV3 and HV5) and *Bromus secalinus* (BS)). Taxa are distinctly clustered (red dashed lines).

ITEMS FROM THE RUSSIAN FEDERATION

AGRICULTURAL RESEARCH INSTITUTE FOR THE SOUTH-EAST REGIONS
Department of Genetics, Laboratory of Genetics and Cytology, 7 Toulaikov St., Saratov, 410010, Russian Federation.

The evaluation of spring bread wheat cultivars, NILs, and introgression lines in the hard, drought conditions of 2009–10.

S.N. Sibikeev, A.E. Druzhin, V.A. Krupnov, T.D. Golubeva, and T.V. Kalintseva.

For the recommendation of introgression lines with identified combinations of genes for resistance to pathogens in practical breeding some prebreeding research is necessary. These research includes determining resistance to abiotic stresses and bread-making qualities. The conditions of the growing periods of 2009 and 2010 allowed estimating the set of introgression lines for drought resistance. The two-year-old data for grain productivity in NILs in the extremely hard drought conditions have shown the following results. The combination of *Lr9*+*Lr19*-translocations in the genotypes of cultivars L503, Dobrynya, and line L2032, do not depress yielding ability, but *Lr19*+*Lr26* significantly improves grain productivity, and *Lr19*+*Lr24* and *Lr19*+*Lr25* significantly depresses yield ability. A neutral reaction for grain productivity in the introgression lines with substitution 6Agi (6D) is detected. The incorporation of genetic variability from *T. turgidum* subsps. *dicoccoides* and *dicoccum* to the spring bread wheat cultivars Saratovskaya 58 and Saratovskaya 55 (lines L196 and L2870) does not depress drought resistance, but incorporation of genetic variability from durum wheat (cultivars Saratovskaya zolotistaya, Lyudmila, and Saratovskaya 57) to bread wheat (lines L200/09 and L211/09), and their combination improves this trait. The NILs with combinations of translocations *Lr9*+*Lr19*, *Lr19*+*Lr24*, *Lr19*+*Lr25*, substitution 6Agi (6D), and also lines L196, L2870, L200/09, and L211/09 have good bread making quality at the level of cultivars. The NIL of L503 with combination of *Lr19*+*Lr26* translocations was exception in which the flour strength was reduced.

The evaluation of spring bread wheat introgression lines of the Genetics and Cytology Laboratory at ARISER in breeding for resistance to leaf and stem rust.

S.N. Sibikeev, A.E. Druzhin, L.I. Laikova (Institute of Cytology and Genetics, Novosibirsk, Russian Federation), D. Singh (KARI, Njoro, Kenya), and A.A. Morgounov (CIMMYT, Turkey).

In the 2010 growing season, a set of introgression lines was estimated for resistance to leaf and stem rusts on the experimental fields of the Institute of Cytology and Genetics (Academgorodok, Novosibirsk, Russia) and for resistance to race Ug99 + *Sr24* (TTKST) of stem rust in the KARI, Njoro, Kenya under natural epidemic conditions. We detected that the NILs with translocation combinations *Lr19+Lr24* and *Lr19+Lr26*, and also lines L196, L2870, L200/09, and L211/09, are resistant to leaf and stem rusts, including to Ug99. Thus, the efficiency of combinations *Lr19/Sr25+Lr24/Sr24* and *Lr19/Sr25+Lr26/Sr31* and also the unidentified leaf and stem rust genes in lines L196 and L2970 has been shown. In lines L196 and L2870, the probability is very high that the leaf and stem rust genes are linked, because during breeding of these lines, selections were conducted only for resistance to leaf rust.

The dynamics of population change Puccinia triticina at ARISER, Russian Federation, during 2008–10.

S.N. Sibikeev and A.E. Druzhin.

The climatic change in the Volga Region was all the more noticeable by its influence on the composition of the population *P. triticina*, which is considered one of the most virulent. Analysis of *P. triticina* population dynamics during 3 years (2008–10), showed that it is quite responsive to increases in air temperature. The study of leaf rust population composition was carried out in a greenhouse on NILs of Thatcher with differing *Lr* genes. Inoculations in the grenhouse were performed at the optimum temperature (20–22°C) using uridinospores that were collected in the field on susceptible cultivars of winter wheat. During 2008, the air temperature did not exceed the critical value for the pathogen (31°C) for virtually the entire season (Fig. 1); and a majority of virulent pathotypes were present in the population (Table 1).

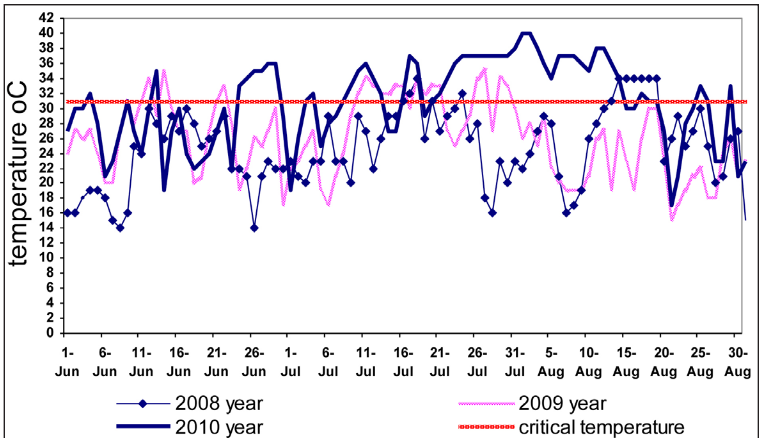

Fig. 1. The maximum temperature for 2008–10.

Since 2009, the has situation changed. The air temperature during the period of infection in field conditions is often higher than the critical indicator for the pathogen or is above the optimal value. This has led to the fact that in the population of the fungus eliminated or reduced their virulence the following pathotypes: pp11, pp14b, pp19, pp24, pp32, and pp40. In 2010, when temperatures during the vegetative period were very high (35-40°C) and in a hard drought (Fig. 1), significant changes were noticed

Table 1. The dynamics of change of the formula avirulence/virulence in populations of *Puccinia triticina* at the Agricultural Research Institute for the South-East Regions, Russian Federation, in 2008–10.

Year	Avirulence/virulence formula
2008	**9, 17a, 29, 28, 41, 42**/2a, 2b, 2c, 3a, 3bg, 3ka, 10, 11, 12, 13, 14a, 14b, 14ab, 15, 16, 18, 19, 20, 21, 22a, 23, 24, 25, 26, 27+31, 30, 32, 33, 34, 37, 38, 40, b, H
2009	**9, 11, 14b, 19, 24, 28, 29, 32, 40, 41, 42**/2a, 2b, 2c, 3a, 3bg, 3ka, 10, 12, 13, 14a, 14ab, 15, 16, 17a, 18, 20, 21, 22a, 23, 25, 26, 27+31, 30, 33, 34, 37, 38, b, H Infection type: 0; 1^-: 14b, 19, 32 22^+: 40 2^+3: 11
2010	**2b, 2c, 3a, 3bg, 3ka, 9, 10, 11, 12, 13, 15, 16, 17a, 19, 21, 24, 28, 29, 30, 32, 41, 42, H**/2a, 14a, 18, 20, 22a, 23, 27+31, 37, 38, 14b, 14ab, 33, 34, b Infection type: 0;1: 9, 21, 32 1^-: 2c, 12, 13, 29 11^+: 2b, 16 1^+2: 3a, 11 2^+: 3bg, 3ka, 10, 15, H 2^+3^-: 30

in the *P. triticina* population. In the pathogen population, there was eliminated or decreased virulence for the following pathotypes: pp2b, pp2c, pp3a, pp3bg, pp3ka, pp10, pp11, pp12, pp13, pp15, pp16, pp17a, pp19, pp21, pp24, pp30, pp32, and ppH. It is interesting that the following virulent pathotypes remained in the population: pp2a, pp14a, pp18, pp20, pp22a, pp23, pp27+31, pp37, pp38, pp14b, pp14ab, pp33, pp34, and ppb, which showed high adaptability to high temperature and were drought resistant.

Effects of interaction 6Agi (6D) chromosomes from Thinopyrum intermedium and Lr19 translocation from Th. elongatum on flour protein content spring bread wheat.

O.V. Krupnova, S.A. Voronina, V.A. Krupnov, and A.E. Druzhin.

On leached, chernozem soil with a crop rotation (a bare fallow–spring bread wheat), flour protein content varied from 13.9% up to 20.3% and gluten content from 30% up to 48%. In these conditions, near isogenic lines for chromosome 6Agi (6D) from *Th. intermedium* and an *Lr19* chromosome 7D translocation from *Th. elongatum* had a positive influence on flour protein content in spring bread wheat, both within a leaf rust epidemic and without.

In a population from crosses between parents Л400R and 6Agi(6D) and Л1089 and *Lr19*-T7D, we selected recombinant inbred lines Л204 and Л205, which have the combination *Lr19*-T7D and 6Agi(6D). In a population from crosses between parents Л2032 (*Lr19*-T7D) and Л400R, we are selected RILs Л108 and Л396, which have only 6Agi (6D). All four lines (Л204 and Л205, Л108, and Л396) are resistant to the Saratov population of a leaf rust and, on a grain yield and a flour protein yield per unit area, exceed that of the parents. For flour protein content, they are less than that of the parents. The mechanism of interaction, 6Agi(6D)/*Lr19* and *Lr19*/6Agi(6D), in a *T. aestivum* background, and the control of the decrease in flour protein content in the RILs, compared with the parents, are unknown.

Laboratory of Spring Durum Wheat Breeding, 7 Tulaikov Street, Saratov, 410010, Russian Federation.

A new spring durum wheat cultivar 'Nikolasha' has been released in the Russian Federation.

N.S. Vassiltchouk, L.A. Bespalova, G.I. Shutareva, A.N. Borovik, S.N. Gaponov, V.M. Popova, L.V. Yeremenko, T.M. Parshikova, and N.M. Tsetva, and P.P. Lukyanenko (Krasnodar Research Institute for Agriculture (KRIA), Wheat and Triticale Breeding Department, Krasnodar, 350012, Russian Federation).

The State Commission on the Test of Breeding Achievements approved a new cultivar of spring durum wheat named 'Nikolasha' (137/00-5) for use in agricultural production in 2009–10. Nikolasha appears well adapted to southern and southeastern areas of European part of the Russian Federation, such as the Krasnodar, Rostov, and Saratov regions. The cultivar was developed thanks to the joint breeding program between P.P. Lukyanenko Krasnodar Research Institute for Agriculture (KRIA) and Agricultural Research Institute for the South-East Regions (ARISER).

Cultivar Nikolasha was developed as a result of individual plant selection in the F_2 generation from the hybrid population obtained by crossing the line D-2033 with the cultivar Nick (D-2029) at ARISER. The line D-2033 was derived from a cross between two highly drought-resistant local lines Leucurum 1863 and Leucurum 1945. The cultivar Nick was derived from a cross between Saratovskaya zolotistaya and Altayskaya Niva. The local cultivar Saratovskaya zolotistaya has very high quality grain and pasta products. The cultivar Altayskaya Niva originated from the Altay region and is highly resistant to common bunt and loose smut. The elite plant was selected in the F_8 generation at KRIA in 2001. The field test of the line 137/00-5 was conducted in Krasnodar in 2004–05.

The spike of Nikolasha is white with white awns, pyramidal in shape, and of medium length (6–8 cm) and density (26–27 spikelets/10-cm rhachilla). Kernels are amber and vitreous. The 1,000-kernel weight was 38–46 g and test weight was 770–822 grams/L. Plants have good resistant to lodging. Plant height is 100–115 cm, which is 5 cm lower than that of the standard cultivar Novodonskaya. Plant heading is earlier than that of Novodonskaya by 1–2 days.