Weed survey in central north Bulgaria

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During 2004-2006, a national survey of weed communities in winter wheat, barley, maize and sunflower was done in 14 different regions of Bulgaria. The objective was to improve knowledge of the weed communities of cultivated areas in order to develop effective weed control. The software "Kadis" was created for data base development, analysis and mapping of weed flora in Bulgaria. The survey in Central North Bulgaria (V. Turnovo region) was part of the national weed investigation. A total of 103 representative fields of winter wheat crop (6,600 ha), 31 of winter barley (1,650 ha), 73 of sunflower (4,230 ha), and 37 of maize (2,300 ha) were assessed by visually scoring weeds in the whole field and margin. The estimation of weed density was taken according to density cover index (d.c.i.): 0 = none present; 1 = weak degree of infestation (evaluated cover <5%); 2 = average degree (5-25%); 3 = high degree (25-50%); 4 = very high degree (50-100%). In winter wheat, a total of 39 species was found. The dominant weed species in the fields were: Cirsium arvense (L.) Scop. (71% of the fields with d.c.i. 2-3), Galium aparine L. (54% with d.c.i up to 3), Anthemis arvensis L. (47% with d.c.i. 2-3), Sinapis arvensis L. (47% with d.c.i up to 3). The most problematic grass weeds were: Avena fatua L., A. sterilis ssp. ludoviciana (Dirieu) Gillr&Magne, and Alopecurus myosuroides Hudson. It was found that Cephalaria transsilvanica (L.), Conium maculatum L., Daucus carota L., Cichorium intybus L., and Rumex crispus L. spread from margin to the field. The increasing expansion of Cirsium arvense was evident in the last decade. In winter barley the most frequent perennial weeds were Cirsium arvense and Sorghum halepense (L.) Pers., while the most frequent annual were Galium aparine, Anthemis arvensis, Sinapis arvensis, and Avena sp. In sunflower, since the last national survey in 1980, an increasing tendency for the dominance of some perennial weeds likes Sorghum halepense (L.) Pers. (82% of the fields with d.c.i up to 3), Cirsium arvense (73% with d.c.i up to 3), Convolvulus arvensis L. (48% with d.c.i of 2) was found. Among annual weeds the most frequent were Xanthium strumarium L. (53% of the fields), Abutilon theophrasti Medicus (56%), and Sinapis arvensis (51%, with high degree of infestation). New species which were previously almost unknown have appeared, e.g. Conyza canadensis (L.) Cronq. and Lactuca serriola L. The most problematic weeds in maize were Sorghum halepense (94% of the fields with d.c.i up to 3-4), Cirsium arvense (70% with d.c.i 2-3), Convolvulus arvensis (62% with d.c.i 2-3), Abutilon theophrasti (43% with d.c.i 2-3), Xanthium strumarium (62% with d.c.i 3), Solanum nigrum, Setaria sp., and Echinochloa crus-galli (L.) Beauv. An aggressive spread of Sorghum halepense in both uncultivated and cultivated fields was evident. It can be concluded that, due to climate and economic changes occurred in the past years, weed species abundance is increasing becoming a serious problem. Tillage practices and herbicide weed control technologies used have not been sufficient. The increasing size of area infested with Cirsium arvense, Sorghum halepense, Rumex crispus, as well as density cover index, associated above all with use of disc harrowing. The choice of crops in rotations, chemical and mechanical weed control, fertilization, soil management, sowing technique, purification of seeds and agricultural land separation are the main reasons for these negative processes.