

MORPHOLOGICAL CHARACTERIZATION AND GERMINATION BEHAVIOR OF ITALIAN WEEDY RICE. S. Fogliatto, F. Vidotto and A. Ferrero; Università degli Studi di Torino, Grugliasco, TO , Italy.**ABSTRACT**

Weedy rice (*Oryza sativa* L.) is one of the most troublesome weeds in rice production worldwide. Infestations are widespread in all European rice cultivation countries, reaching about 40-75% of the total area of rice cultivation. In Italy which has more than 50% of the total European rice area, weedy rice infestations are becoming more and more severe since the early '60s because of shifting from transplanting to direct sowing, the introduction of semi-dwarf Indica type varieties and the presence of the weed seeds in commercial rice seeds. Weedy rice shows diverse anatomical, biological and physiological traits that make the weed more competitive with cultivated rice. Moreover, a large number of weedy rice populations have dormant seeds that contribute to build up of the soil seed bank. The objective of this study was to investigate the biological diversity of Italian weedy rice through morphological characterization and an assessment of dormancy of the most prevalent populations. Seed collection of weedy rice was conducted during the summer of 2008 from a rice area of about 130,000 ha in North- West Italy. The surveyed area was divided into 40 zones and one or two representative fields were selected per zone. Seed collection was based on different plant morphological traits, identifying 151 populations. In spring 2009, the collected populations were sown in the field to avoid confounding with environmental effects. Germination test and a morphological characterization were conducted. The germination test was carried out immediately after harvest (0 Day of After-Ripening), at 10 DAR and at 30 DAR in Petri dishes at constant temperature (25°C). Evaluation of plant traits was performed in the field, recording the following characteristics: stem length, node color, tillering ability, flag leaf length, angle of flag leaf blade, distribution of awned grains in panicle, panicle length, panicle angle, angle of panicle branches and time of maturity. Seed traits were evaluated in the laboratory. The following seed traits were measured: hull color, grain length, grain width, awn length, seeds per panicle, weight of 1000 seeds and on dehulled grains: length, width and color. The results of the germination test showed that the awnless seeds exhibited a higher germination capacity compared to mucronate and awned populations. Moreover, blackhulled and brownhulled seeds, that are usually awned, have a higher dormancy. After-ripening influenced dormancy breaking process, even if the maximum germination at 30 DAR was still low for many populations (about 20%). Within the same populations, the different biotypes presented a wide range of germination capacity at the end of the after-ripening period. Different collection zones did not show a clear effect on dormancy behavior of the populations, however the Southern areas displayed a significant higher germination. Within each zone a variability in the germination capacity was recorded according to the presence of different populations. The morphological assessment showed that weedy rice plants were usually taller than cultivated rice, but no differences among weedy rice populations were showed when they were grouped by seed traits. Brownhulled populations showed the highest values on awn length, grain length and width. The results of this study confirmed that Italian weedy rice populations have a large variability in term of dormancy behavior and morphological characteristics, that results in a high adaptability to different cultivation environments and makes the management of the weed quite difficult.