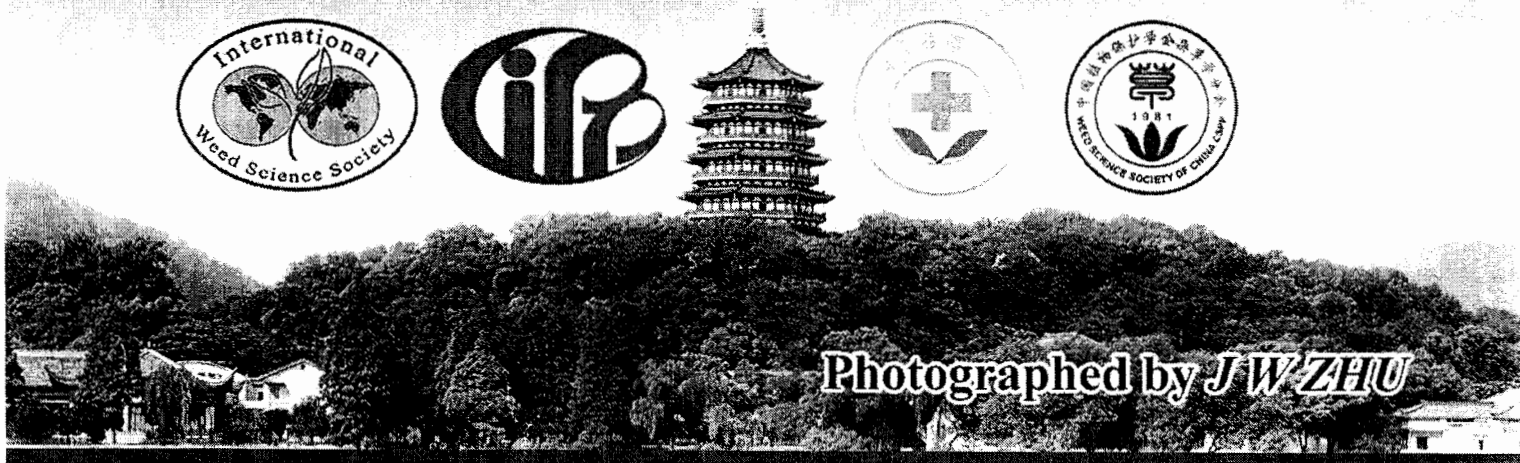
The 6th International Weed Science Congress

Proceeding



Photographed by *J W ZHU*

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Keywords: Echinochloa;phylogeny;ITS;Korea;taxa;

Effect of soybean crop on the processes that ensure the success of *Digitaria sanguinalis* to maintain its population on a field

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Digitaria sanguinalis (L.) Scop. (large crabgrass) is a summer annual weed that has increased its constancy since the adoption of no tillage system in the summer crops of the Argentinean Rolling Pampas. This success over time and space may possibly be related to control avoidance by establishing seedlings at different moments during the crop cycle. Weed establishment depends on seed dormancy, germination and seedling emergency. All these processes are modulated by pre dispersal factors occurring during seed growth and development and post dispersal factors affecting seed bank environment. The objectives of this work were to study i) the modifications of the environment produced by different soybean crop arrangements and its effect on weed plant biomass, seed production and dormancy and ii) the effect of soybean crop competition and different soil covers on weed establishment. For the first objective a manipulative factorial field experiment (factors: soybean crop-weed competition, interrow distance, soybean maturity group and inter-row distance) and a mensurative field experiment (treatments: plants growing with crop, with crop but in a gap on the crop and without crop) were performed in 2009-10. For the second objective a factorial manipulative experiment (factors: soybean crop – weed competition and soil cover) was performed in 2010-11. The presence of the crop reduced the radiation intercepted by the weed and the R-FR ratio. The crop – weed competition for radiation affected weed biomass and partitioning to reproductive structures. As biomass decreased, the seeds per plant decreased linearly. On the other hand, the modification of the environment where the mother plant grows caused a reduction on the dormancy level of seeds. Homogeneous soybean crops together with maize or soybean stubble on soil surface reduced the germination-emergence of D. sanguinalis by reducing fluctuations of soil temperature. Soybean crop modified the performance of D. sanguinalis through changes of the pre-dispersal and post-dispersal environment.
Keywords: Digitaria sanguinalis;Soybean;Weed establishment;Pre-dispersal environment;Post-dispersal environment;

Modelling seed germination response of Lepyrodiclis (lepyrodiclis holosteoides Fenzl) to temperature

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Lepyrodiclis is an annual winter weed of the Caryophyllaceae family. It infests wheat fields, as it grows up and over crops forming a canopy that shades crop from sun. It is becoming a problematic weed in Iran and no herbicides are currently registered for his control. The ability to predict time of weed seedling emergence relative to the crop is an important component mechanistic model describing weed and crop competition. Although there are many biotic and environmental factors affecting the time of seedling emergence, temperature is the one of most important. In order to study cardinal temperatures and participate time of emergence of this weed in field, an experiment was performed in a completely randomized design whit six replication and nine levels of temperature (2, 5, 10, 15, 20, 25, 30, 32.5, 35 °C) in a standard germination chamber in dark condition at Faculty of agriculture, Ferdowsi University of Mashhad, Iran in 2011. The regression models were segmented, beta and quadratic. Results indicated that temperature affected germination rate and percentage. The cardinal temperatures including base temperature (Tb), optimum temperature (To) and ceiling temperature (Tc) for segmented was -2.7, 23.5and 37.6°C, for beta was -0.44, 22.4 and 35°C and for quadratic were 1.45, 19.6 and 37.8°C respectively. Beta model with lowest RMSE (0.01) and highest R2 (0.99) were best model. on the other hand, it is concluded that Lepyrodiclis with lower Tb than wheat is able to germinate earlier thus it will be dominant early in the season and compete with crops.
Keywords: Germination;Nonlinear models;base temperature;optimum temperature;ceiling temperature;

Diversity of weeds and arthropods in fencerows is enhanced when crop types at both adjoining fields are different

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Plant communities within fields and their surroundings have been considered as drivers of biodiversity in agricultural areas. Linear habitats, such as fencerows and field margins, usually sustain higher plant diversity than within fields due to the greater environmental stability, which may enhance the biodiversity of adjoining fields. This study is aimed at testing if crop heterogeneity at adjoining fields affects fencerow weed and arthropods assemblages and discuss its importance to functional biodiversity in landscapes with highly intensified agriculture. We selected homogeneous and heterogeneous pairs of fields separated by fencerows. Weed and arthropod species were recorded at different distance to fencerow (0, 4, 20 and, 100 m). Mean species richness and similarity index (Jaccard) were calculated. Results report that both weed and arthropod fencerow assemblages are significantly affected by the level of heterogeneity of the adjoining fields. The richness of weed species in fencerows intersecting heterogeneous neighbourhoods and the abundance of non-herbivore arthropods are greater than those of fencerows dividing homogeneous neighbourhoods. Differences in fencerow assemblages were not caused by an additive effect of species associated to different crops. Species assemblages of fencerows intersecting heterogeneous cropping neighbourhoods are composed by species that are not found in the adjoining fields. This suggests that field interface offers a habitat suitable for more diverse assemblages when crops sharing it are different. Heterogeneous neighbourhoods effects on assemblage's diversity occurs despite of the fact that the fields in this study share the same agricultural history over the last thirty years, and the difference in neighbourhood cropping heterogeneity changes on a yearly base. Differences in fencerow weed assemblages are also found within the adjoining fields at increasing distance to fencerow. Cropland heterogeneity provided by crop diversification affect fencerow habitats promoting diverse weed and arthropods communities, which are important for sustaining farmland biodiversity and ecosystem services.
Keywords: biodiveristy;agricultural intensification;cropland heterogeneity ;richness;linear habitats;

Will invasive weeds track climate change