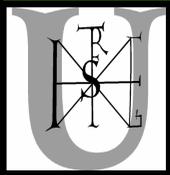


PRECIPITATION AND TEMPERATURE STRESS IMPACTING WEED-CROP COENOLOGY PERFORMANCE

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Materials and methods

- term: twelve years (1996-2007)
- object: winter wheat (*Triticum aestivum* L.) varieties and maize (*Zea mays* L.) hybrids, identical agronomic conditions
- place: Nagygyombos experimental field of the SZIU Crop Production Institute
- plot: small plots (10 m²) in split-plot design with four replications
- treatments: Weed control (furoxipir, bromoxynil, dicamba and MCPA a.i.), the rate and application time of nitrogen top dressing (ammonium nitrate 0-40-80 kg/ha in direct and split applications), fungicides and insecticides (triadimefon, tebukonazol+triadimefon, besultap a.i.)
- examination of Coenological performance of weed-crop interrelation: 28 weed species representing 7 phenological types (T1, T2, T2-3, T3, T4, G1 and G3) were examined in seasonal precipitation and temperature prior to their life cycles
- herbology and coenology data have been evaluated in favour of exploring climatic impacts – mainly that of precipitation and temperature records.

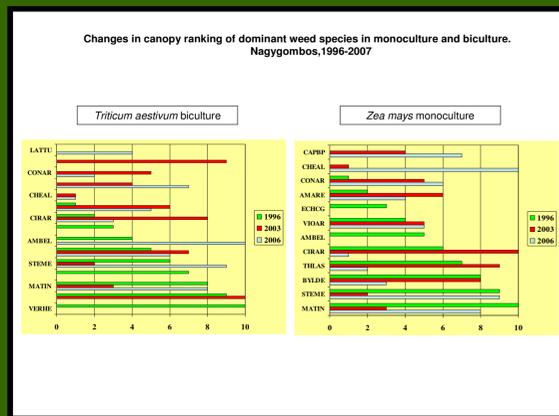


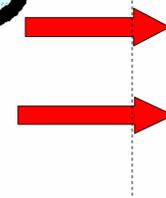
Figure 1. Weed species canopy changes over time range of the experiment

Important elements of the environment

precipitation



temperature



Quality & quantity of wheat

Weed species canopy

Results and discussion

Correlations were found between weed canopy records and precipitation and temperature values of certain periods in relation with phenophases or periods prior to vegetation, and their combinations. Table 1 indicates significant correlation values and equations.

The results obtained support an evidence, that weed populations have been influenced by precipitation patterns mainly. The occurrence of precipitation has not always been related to the vegetation period, but more to the phenology pattern of the weed species examined. Early annual weed populations have been correlated with precipitation in most cases, however late annuals were affected by temperature values as well. From among perennial G1 species no correlations were obtained. G3 species were affected by previous to life cycle precipitation and temperature values.

Canopy ranking of dominant weed species have been evaluated over the time range of the study. Figure 1 shows the changes in canopies and their tendencies. It can be stated, that the originally homogenous coenosys of weed species has been altered by both monocropping and biculture. Also, there is a notable phenomenon regarding the decrement of some highly frequented weeds like *Echinochloa* or *Ambrosia* species.

Conclusions

Strong correlations were found in cases of various precipitation patterns. Some precipitation x temperature interactions proved to be significant, mainly in perennial types. Consecutive agronomic applications in both monocropping and biculture have resulted in elimination of noxious species.

Form of life of weeds	Climatic factor	Equation	r ²
T1	Spring – winter precipitation	$y = 66,869x + 68,198$	0,6247
	Summer – winter precipitation	$y = 39,49x + 67,777$	0,7105
T2	Spring – winter precipitation	$y = 56,171x + 62,772$	0,5669
	Summer – spring precipitation	$y = 1,7486x + 9,1771$	0,699
T2-3	Spring – winter precipitation	$y = 29,173x + 65,955$	0,6861
	Summer – winter precipitation	$y = 38,312x + 60,766$	0,6762
T3	Summer – previous winter precipitation	$y = -1,2199x + 0,2112$	0,7015
	Summer – previous winter precipitation × temperature	$y = -109,9x + 23,993$	0,7217
T4	Spring – vegetation period precipitation	$y = 2,9658x + 367,64$	0,5707
	Spring – vegetation period precipitation × temperature	$y = 23,314x + 3378,7$	0,5447
G1	ns		
G3	Spring – previous autumn precipitation	$y = 6,4041x + 55,991$	0,649
	Spring – previous autumn precipitation × temperature	$y = 64,872x + 535,81$	0,688

Table 1. Precipitation and temperature impacts on weed phenology groups