

WEEDS FLORA IN ALFALFA FIELDS

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Pavlović Dragana, Ljiljana Topalić-Trivunović and Ljiljana Belošević (2004): *Weeds flora in alfalfa fields*. - *Acta herbologica*, Vol. 13, No. 1, 59-64, Beograd.

Weeds flora in alfalfa stands around Cacak in the first, third, fourth and tenth years of alfalfa growing were studied. Floristic composition of the weeds flora has been determined, its ecological and other characteristics, as well as succession of appearance of wild-growing plant species. 116 species have been found in weeds flora of alfalfa fields, and the most represented species are from the families of *Fabaceae*, *Asteraceae* and *Poaceae* etc.

Key words: alfalfa, year of growing, weeds flora

INTRODUCTION

Alfalfa (*Medicago sativa* L.) is a perennial plant (*Fabaceae*) that is highly valued legume forage used in almost all parts of the world. Since it is a legume, it is able to produce high yields without nitrogen fertilization and plays an important role in crop rotation through its positive effects on soil fertility, soil structure and reduces soil erosion (BOSCHETTI *et al.*, 1998.). Soil fertilized with alfalfa's growth maintains good characteristics 2-3 years after alfalfa is replaced with another plant (OCOKOLJIĆ, 1975). The weed present in any field depends on soil type, environmental conditions, the previous crop history, and the weed management practices.

MATERIALS AND METHODS

Weeds species in an alfalfa fields were collected during the spring, summer and the first months of the autumn 1998 at four areas of 100 m² in the village of Miokovci, 9 km northwest from Čačak. A research was conducted in the alfalfa fields in the first, third, fourth and tenth year of alfalfa growing. Plant species were determined at the Institute for biology at the Faculty of Science in Kragujevac using standard literature: JOSIFOVIĆ, 1970-1977; PANČIĆ, 1976; JAVORKA and CSAPODY, 1979; WEYMAR, 1967; KLAPP and OPITZ VON BOBERFELD, 1990. Plant belongs families were determined according to TUTIN *et al.*, 1964. Life forms and floristic elements were determined according to OBERDORFER, 2001.

RESULTS AND DISCUSSION

116 species of wild-growing plants were found on the areas explored and their number increased from 27 in the first year, to 80 and 79 species in the fourth and tenth year of the alfalfa growing. (Table 1).

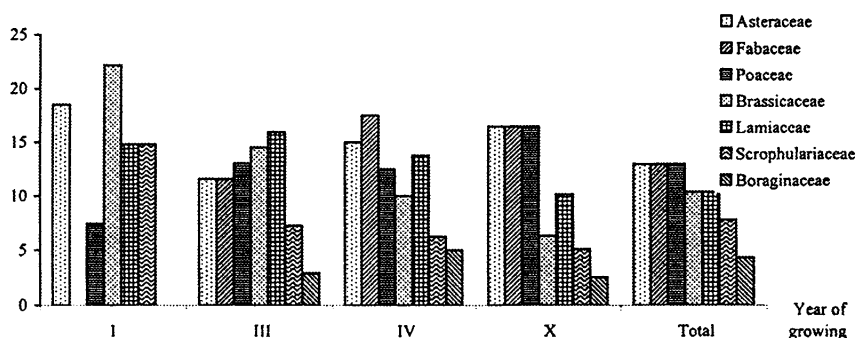
Weeds flora in alfalfa stands changes depending on the stage of growing alfalfa. During the establishing of alfalfa, until the first mowing, the most large in number are broadleaf weeds species like: *Sinapis arvensis*, *Stellaria media*, *Capsella bursa-pastoris*, *Amaranthus retroflexus*, *Papaver rhoeas*, *Lamium amplexicaule* and *Chenopodium album*. The biggest number of species represented in the first year belong to the families *Brassicaceae*, *Asteraceae*, *Lamiaceae* and *Scrophulariaceae* (Graph 1). In life form spectrum in the first year of growing of alfalfa the most dominant are terophyte, then hemicryptophyte, geophyte are present with two species, while chamephyte have not been found (Graph. 2). In chorological spectrum the biggest percentage is of the cosmopolitan species and the great areal species which belong to the Euro-Asian group of floristic elements (Graph 3). During the third and fourth year of alfalfa growing at the locations where the research has been conducted on, the presence of terophyte decreases, but the presence of hemicryptophyte, geophyte and hamephyte increases (Graph 2). Proportional participation of the family *Brassicaceae* decreases, while number of species of the families *Poaceae*, *Asteraceae*, *Lamiaceae* and especially *Fabaceae* increases (Graph1). Participation of the cosmopolitan species in areal spectrum decreases, while participation of the species from the Euro-Asian and the Sub Mediterranean groups of floristic elements increases (Graph 3). In the fourth year of growing, besides increase in total number of weeds species, their ground density also increases, which indicates weak competitive ability of alfalfa, and change floristic composition of alfalfa's stands into vegetation of meadows. Qualitative structure of weed species in alfalfa stands after ten years of growing is a bit different from alfalfa stands that are in fourth year of growing, but ground density of wild-growing plants in the tenth year of growing is considerably higher. A large number of recorded species in the tenth year of alfalfa stands are bad as a cattle fodder, totally useless and even harmful plants (MRFAT-VUKELIĆ *et al.*, 1997).

Table 1. - Weeds flora in alfalfa stands

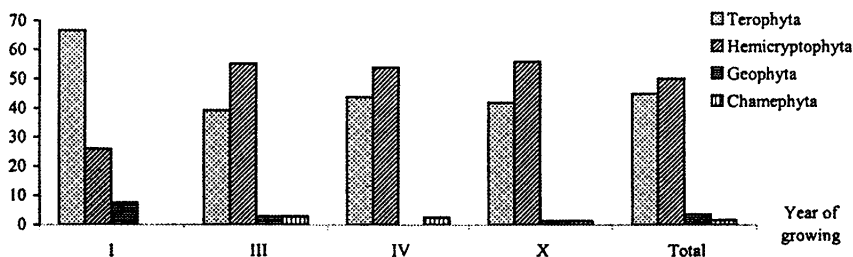
Weeds species	Year of growing				Weeds species	Year of growing			
	I	III	IV	X		I	III	IV	X
<i>Stellaria media</i> (L.) Vill.	+	+	+	+	<i>Festuca pratensis</i> Huds.	.	+	+	+
<i>Capsella bursa pastoris</i> (L.) Med.	+	+	+	+	<i>Poa annua</i> L.	.	+	+	+
<i>Cardamine hirsuta</i> L.	+	+	+	+	<i>Poa pratensis</i> L.	.	.	+	+
<i>Thlaspi perfoliatum</i> L.	+	+	+	+	<i>Convolvulus arvensis</i> L.	+	.	.	+
<i>Veronica arvensis</i> L.	+	+	+	+	<i>Brassica nigra</i> (L.) Koch.	+	+	.	.
<i>Veronica persica</i> Poir.	+	+	+	+	<i>Sinapis arvensis</i> L.	+	+	.	.
<i>Lamium amplexicaule</i> L.	+	+	+	+	<i>Setaria italica</i> (L.) Beauv.	+	+	.	.
<i>Lamium purpureum</i> L.	+	+	+	+	<i>Euphorbia seguieriana</i> Neck.	.	+	.	+
<i>Salvia pratensis</i> L.	+	+	+	+	<i>Euphorbia helioscopia</i> L.	.	+	.	+
<i>Salvia verticillata</i> L.	+	+	+	+	<i>Ranunculus millefoliatus</i> Vahl.	.	+	+	.
<i>Bellis perennis</i> L.	+	+	+	+	<i>Thlaspi arvense</i> L.	.	+	+	.
<i>Hieracium pilosella</i> L.	+	+	+	+	<i>Thlaspi allaceum</i> L.	.	+	+	.
<i>Taraxacum officinale</i> Web.	+	+	+	+	<i>Thlaspi praecox</i> Wulf.	.	+	+	.
<i>Setaria viridis</i> (L.) Beauv.	+	+	+	.	<i>Trifolium campestre</i> Schreb.	.	+	+	.
<i>Cerastium fontanum</i> Baumg.	.	+	+	+	<i>Cerinthe minor</i> L.	.	+	+	.
<i>Ranunculus nemorosus</i> DC.	.	+	+	+	<i>Myosotis arvensis</i> (L.) Hill.	.	+	+	.
<i>Viola arvensis</i> Murr.	.	+	+	+	<i>Veronica chamaedrys</i> L.	.	+	+	.
<i>Draba muralis</i> L.	.	+	+	+	<i>Verbena officinalis</i> L.	.	+	+	.
<i>Coronilla varia</i> L.	.	+	+	+	<i>Glechoma hederacea</i> L.	.	+	+	.
<i>Melilotus officinalis</i> (L.) Pall.	.	+	+	+	<i>Mentha longifolia</i> (L.) Huds.	.	+	+	.
<i>Lotus corniculatus</i> L.	.	+	+	+	<i>Scutellaria hastifolia</i> L.	.	+	+	.
<i>Lathyrus latifolius</i> L.	.	+	+	+	<i>Stachys annua</i> (L.) L.	.	+	+	.
<i>Trifolium pratense</i> L.	.	+	+	+	<i>Silene vulgaris</i> (Moench.) Garcke	.	.	+	+
<i>Trifolium repens</i> L.	.	+	+	+	<i>Alyssum alyssoides</i> (L.) L.	.	.	+	+
<i>Daucus carota</i> L.	.	+	+	+	<i>Medicago lupulina</i> L.	.	.	+	+
<i>Galium mollugo</i> L.	.	+	+	+	<i>Lathyrus nissolia</i> L.	.	.	+	+
<i>Cruciata laevipes</i> Opiz.	.	+	+	+	<i>Trifolium incarnatum</i> L.	.	.	+	+
<i>Veronica agrestis</i> L.	.	+	+	+	<i>Vicia sativa</i> L. ssp. <i>nigra</i> (L.) Ehrh.	.	.	+	+
<i>Ajuga genevensis</i> L.	.	+	+	+	<i>Vicia sativa</i> L.	.	.	+	+
<i>Ajuga reptans</i> L.	.	+	+	+	<i>Vicia cracca</i> L.	.	.	+	+
<i>Prunella vulgaris</i> L.	.	+	+	+	<i>Vicia hirsuta</i> (L.) Gray.	.	.	+	+
<i>Campanula patula</i> L.	.	+	+	+	<i>Knautia arvensis</i> (L.) Coult.	.	.	+	+
<i>Achillea millefolium</i> L.	.	+	+	+	<i>Valerianella carinata</i> Lois.	.	.	+	+
<i>Cichorium intybus</i> L.	.	+	+	+	<i>Lithospermum arvense</i> L.	.	.	+	+
<i>Crepis biennis</i> L.	.	+	+	+	<i>Plantago lanceolata</i> L.	.	.	+	+
<i>Crepis setosa</i> Hall.	.	+	+	+	<i>Inula britannica</i> L.	.	.	+	+
<i>Leucanthemum vulgare</i> Lam.	.	+	+	+	<i>Conyza canadensis</i> (L.) Cronq.	.	.	+	+
<i>Bromus sterilis</i> L.	.	+	+	+	<i>Sonchus asper</i> (L.) Hill.	.	.	+	+
<i>Dactylis glomerata</i> L.	.	+	+	+	<i>Sonchus oleraceus</i> L.	.	.	+	+
<i>Lolium perenne</i> L.	.	+	+	+	<i>Bromus commutatus</i> Schrad.	.	.	+	+
<i>Festuca ovina</i> L.	.	+	+	+	<i>Sorghum halepense</i> (L.) Pers.	.	.	+	+

Species present only in one year of cultivation: I: *Papaver rhoeas* L., *Amaranthus retroflexus* L., *Chenopodium album* L., *Chenopodium hybridum* L., *arabis grabra* (L.) Bernh., *Kickxia elatine* (L.) Dumort., *Linaria vulgaris* Mill., *Anthemis arvensis* L., *Cirsium arvense* (L.) Scop.; III: *Euphorbia esula* L., *Anthyllis vulneraria* L., *Pimpinella saxifraga* L., *Melampyrum arvense* L., *Ornithogalum umbellatum* L., *Calepina irregularis* (Asso.)Thel.; IV: *Echium vulgare* L., *Rhinathus rumelicus* Vel., *Plantago media* L., *Cuscuta europaea*L. X: *Filipendula vulgaris* Moench., *Potentilla hirta* L., *Sanguisorba minor* Scop., *Geranium dissectum* L. *Symphytum officinale* L., *Stachys germanica* L., *Euphrasia stricta* Host., *Sherardia arvensis* L. *Tragopogon pratensis* L., *Aegilops cylindrica* Host., *Agropyron repens* (L.) Beauv. *Arrhenatherum elatius* (L.) Beauv., *Avena sativa* L.

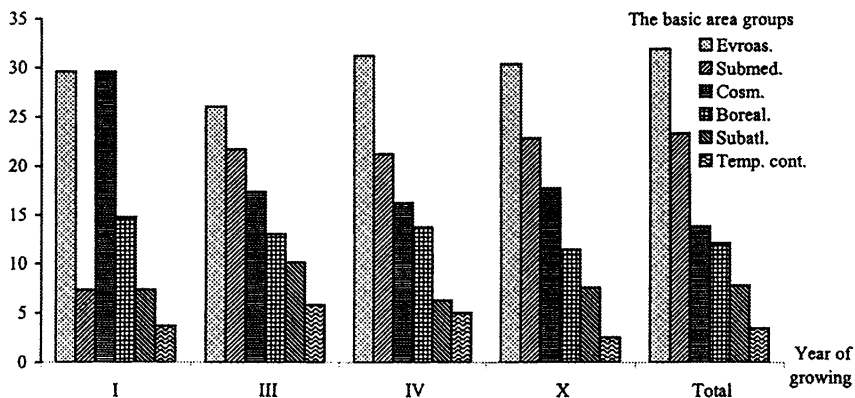
Weeds species found in the first year of alfalfa growing, especially cosmopolitan, terophyte species, indicate a low level of scientific farming methods before plantings alfalfa, insufficient plowing, bad alfalfa seeds, as well as inadequate spring-planted alfalfa. The establishment of alfalfa by the first mowing is very important in order to get a specific, optimal alfalfa density which, then, can resist highly competitive broadleaf weeds species (CADDEL, 2001). An appearance of wild-growing plants which are elements of the secondary vegetation in the third and fourth year of growing is a consequence of low usage of cultivation and herbicide treatments at the time or after establishing of alfalfa stands. In a completely established and well-maintained alfalfa stands weeds cannot reach their expected competitiveness, outgrow and shade alfalfa. In thin alfalfa stands, like the alfalfa stands at the research locations, weeds are able to grow in areas not occupied by alfalfa and compete with it, thus, an additional loss of alfalfa yield results. This is particularly obvious in ten-year old alfalfa habitats where alfalfa survives only because of good climatic or other conditions.



Graph. 1. - Distribution in percentages of weeds in an alfalfa fields according to families (families with the biggest number of species)



Graph. 2. - Life form spectrum of weeds flora in an alfalfa fields



Graph. 3. - Chorological spectrum of weeds flora in an alfalfa fields

CONCLUSION

Quantitative and qualitative structure of weeds flora in alfalfa stands on the researched areas changed depending on stage of alfalfa growing.

Number of wild-growing plants in alfalfa culture was increasing from 27 in the first to 80 and 79 species in the fourth and tenth year of alfalfa growing. Presence of cosmopolitan, terophyte and broadleaf weeds species in the first year of growing is a consequence of an inadequate soil preparation for planting of alfalfa, use of bad seeds and inadequate spring-planting. Number and ground density of perennial hemicryptophyte species from the Euro-Asian, and especially the Sub Mediterranean group of floristic elements increases in the third and fourth year of alfalfa growing because of bad or almost not of any kind weed control. Alfalfa stands, after ten years of alfalfa growing, are repelled by secondary vegetation and is destroyed.

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Recieved March 25, 2004

Accepted April 10, 2004

KOROVSKA FLORA U KULTURI LUCERKE

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I z v o d

Proučavana je korovska flora u lucerištu starom jednu, tri, četiri i deset godina. U prvoj godini gajenja lucerke, odnosno, u godini kad je lucerka zasnovana, najveći procenat korova pre prvog košenja je bio iz grupe terofita, iz familija *Brassicaceae* i *Asteraceae*. Visoka zakorovljenost je rezultat loše predsetvene pripreme zemljišta i neadekvatnog proletnjeg zasnivanja lucerišta. U pogledu fitogeografske pripadnosti zastupljenih korovskih vrsta konstatovana je dominacija kosmopolitskih geoelemenata. U narednim godinama gajenja lucerišta usled veoma niske tehnologije gajenja došlo je do znatnog proređivanja useva što je uzrokovalo masovnu pojavu višegodišnjih korova iz grupe hemikriptofita i to iz familija: *Fabaceae*, *Asteraceae* i *Poaceae*. Sa starenjem useva lucerke kvantitativan je porast elemenata sekundarne vegetacije, tako da je u usevu starom deset godina usled visoke zastupljenosti elemenata okolne (nartivne) flore došlo do potpunog propadanja lucerišta.

Primljeno 25. marta 2004.

Odobreno 10. aprila 2004.