

CULTIVATION SYSTEMS EFFECT BY THE WEEDS

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Introduction

Weed-culture in the wheat fields is more and more difficult to control. The dangerous weeds force the experts to choose the most suitable weed killing strategies. The spread of these weeds not only cause problems when harvesting, but also damage the crops quality and quantity together with the wheat crop profitability and competitiveness. (Nagy, 2003.) The most important 50 weed species in Hungary cover the 90 percent, while the most important 100 cover the 96 percent of Hungary's weed-covered lands. The rest 4 percent is covered by 705 different kinds of weed species.

The goal of my research was originating from the point that protection against weed in current situation is not only an issue related to farming but should also be extended also to inhabited and abandoned meadow areas, banks of watercourses and reservoirs and public areas. The importance of this question is high since areas uncared might turn into center of weed and pest. Obviously protection against weed in crop production is a different task from that of the above mentioned uncared areas.

There has so many reasons of weed spreading in wheat fields, maybe the most important is that they can adapt to different or same cultivation and agriculture system. Other reason was that in the nineties important changing was done in Hungarian agriculture. Great economics were been widespread till regime changing what is live with numerous small farms. In our days these farms keep out the chance of efficient production. (Földesi, 2002.)

Material and Methods

The research area is located on the Józsefmajor Research and Study Farm of Saint Stephan University at the borders of Northern-Big Plain warp-mound-flat area and the Cserhátalja, in the surroundings of Hatvan and Aszód.

In the test launched in October 2002 the *cultivation treatments* were the following: 1. ploughing, controlled, 2. direct seeding, 3. shallow cultivation with cultivator, 4. mulch-leaving cultivation with cultivator, 5. shallow cultivation with discs, 6. soil status improving soil loosening. The stubble coverage figures relatively to the cultivation types: 0, 70-80, 50-60, 40-50, 30-40 and 20-30%.

Vegetation coposition: white mustard (soil structure improving companion crop, 2002), winter wheat (2002/03), rye (soil structure improving companion crop, 2003/04), green peas (companion crop, 2004), and winter wheat (2004/05).

Weed species are classified by their incidence, form of life and hayardousness. Spreading of weeds is also examined based on the influencing factors – soil cultivation, soil condition, plants produced and their sequence, time and method of weed cutback and soil cleaning.

For the survey I have applied the Újvárosi type of method (Percze 2002).

Results and discussion

Ploughing is one of the most often used methods, and its most important advantage is its weed-oppressive ability, while in case of direct drilling weeds might proliferate. The results on the examined area are very similar to the experience have so far.

In the case of green peas seeded in autumn-cultivated soil, **undisturbed till July 1** have counted 23 weed species, while this figure is 19 in the case of green peas **seeded into rye-mulch** in 2004. These two areas are located next to each other and there have been 6 soil cultivation method (see above) applied in both cases. On the site not covered by mulch, there was a full-scope weed killing project needed before seeding. The total weed coverness of the two experiment areas represent significant differences even this way. The covering factor is significantly higher in the case of non-mulch covered areas (8.85%) than in the mulch-covered case (4.85%).

Table 1. Green peas seeded into mulch (2004.) and
Companion crop + wheat (2005.)

	Ploughing		Direct drilling		Low cultivator		Deep cultivator		Disking		Soil loosening	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
T1	0.20		0.50		1.03		0.03		0.35		0.53	
T2	0.32	0.93	0.53	79.15	0.20	45.75	0.68	42.25	0.43	41.25	0.18	25
T4	1.66		5.73	0.3	8.43	0.9	0.60	0.9	4.35	0.3	2.3	0.1
H3			0.08		0.05							
G3	0.05		0.85						0.05			
<i>Perennial weeds</i>	0.05		0.93		0.05				0.05			
Total covering %	2.23	0.93	7.69	82.25	9.71	46.65	1.31	43.15	5.18	41.65	3.01	25.10

In year 2005 proportion of weed decreased in a great extent due to the wheat seeding-rotation (without companion crop it was 23-9, with companion crop it was 19-9). Out of these, two species have significant coverage: the *Viola Arvensis* and the *Bromus Tectorum* that can give even 70 percent of coverage.

In this study the lowest figure for weed covering in case of green peas seeded into mulch resulted after deep-cultivation (1.31%), ploughing (2.23%) and soil loosening (3%), while the weed coverage of the pea sown into the stubble was higher than 5 percent in case of all cultivation systems.

Table 2. Green peas seeded into stubble (2004.) Without companion crop (2005.)

	Ploughing		Direct drilling		Low cultivator		Deep cultivator		Disking		Soil loosening	
	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005
T1	0.67						0.10		0.20			
T2	5.18	1.2	3.10	57.5	3.78	52.5	5.20	73.25	3.17	65.53	2.80	65.53
T3	0.42		0.06				0.13					
T4	2.04		8.56		1.71		4.73		2.46		7.03	
H3	0.09		0.16		0.03				0.05		0.03	
G3	0.45		0		5.52							
Perennial weeds	0.54		0.16		0.03				0.05		0.05	
Total covering %	8.85	1.2	11.88	57.5	9.71	52.5	10.16	73.25	5.88	65.53	10.78	65.53

Different cultivation systems seemed to be effective against the perennial weeds. In case of the pea seeded into mulch the soil which is not dollied had a minimal, but favourable effect on perennial weeds in 2004. In 2004 there were 12 perious weed, while in 2005 only 4 of them spread around: Lamium, Veronica, Bromus and Cirsium species.

Ploughing was proven good again since the lowest covering figure was achived after ploughing. For example coverage of Bromus tectorum was 0.2-0.4% after ploughing while this figure was 30-52.8% after harrowing.

Conclusions

- Due to the favourable wheat density, the proportion of weed species decreased significantly.
- Soil coverage resulted in about 45% less weed coverage among similar circumstances.
- Ploughing reduced weed control and number of species significantly, including all dangerous weed species.
- Direct seeding is a soil condition preserving method according to (ECAAF, 1999) but in the current situation it does not provide efficient weed control, in general 60%.
- The weed oppressive characteristic of the newly planted alfalfa is significantly lower than it is in case of one-year-old alfalfa, as data proves this well.

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