

WEED INFESTATION OF WINTER RAPE IN SLOVAK REPUBLIC

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Summary

In 1998-2000 years weed infestation of winter rape in Slovak Republic is presented. The most important weed species in winter rape in three growing regions are listed.

Key words: winter rape, weed infestation, weediness, weeds, crops as weeds

Introduction

Winter rape (*Brassica napus* ssp. *napus*) is the most important oil-bearing plant in the Slovak Republic at present time. Growing areas were increased from 32 000 ha (in 1999) to 115 300 ha (in 2000). The enlargement of growing areas is caused by relative good yield stability and its good financial implementation. Growing areas of oil-bearing plants (rape, sunflower) are higher than 12% of arable land in some agrobusinesses. This concentration means many risks – e. g. pests and diseases occurrence, but especially weeds.

Material and methods

In 1998-2000 years weed infestation of winter rape in growing regions in 45 different agroecological sites of the Slovak Republic was researched. Weed infestation was evaluated first time in autumn in a growth stage 4-5 leaves after application of preemergent herbicides. The second evaluation was realised in spring, before application of postemergent herbicides. The effectiveness of herbicides was assessed 3-4 weeks after its application. Weediness was evaluated by prediction-amount method.

Results

Weed infestation results of winter rape in Slovak republic are showed in table 1 and figures 1, 2. Results are introduced in 4th degree of weediness (strong weediness, more than 25 % density . m⁻²); *Triticum aestivum* shedding in 3rd degree of weediness (middle weediness, 6 – 25% density . m⁻²). Selected intervals of weediness are 5% (with exception 20 – 30%).

The results shows high degree of weediness with *Anthemis arvensis*, *Matricaria chamomilla* and *Triticum aestivum* in sugar beet growing region in 1998, respectively 2000 (> 30%). In potato growing region with altitude higher than 450m above sea level were established larger spectrum of weeds with high harmfulness (+++), especially *Galium aparine*, *Elytrigia repens* (= *Agropyron repens*), *Tithymalus helioscopia* (= *Euphorbia helioscopia*) and others. High occurrence of *Triticum aestivum* in all growing regions of Slovak Republic in 1998 and 1999 is a proof of low quality of overcrop harvest and it caused problems with crops as weeds in winter rape.

The dominant weed species in 1998 in maize growing region were: *Tripleurospermum perforatum* (= *Matricaria inodora*) – 23%, *Capsella bursa-pastoris* – 21%, *Triticum aestivum* shedding – 18% and *Anthemis* spp. – 7%. In sugar beet growing region was any weed species in 4th degree of weediness listed. But winter wheat shedding was ascertained in 100% growing areas of winter rape, it mean 16 400 ha. The most frequent weed species in 4th degree of weediness in potato growing region was *Capsella bursa-pastoris* - 11%. Occurrence of another weed species in 4th degree of weediness was not found.

In 1999 in maize growing region we ascertained 14,2% winter wheat shedding, which is connected with problems at harvest . *Tripleurospermum perforatum* (= *Matricaria inodora*) was widespread in 4,5% growing areas and *Stellaria media* in 1,3%. In sugar beet growing region was very varied weed flora composition. The most important weed was winter barley shedding – 19,3%, *Anthemis arvensis* – 12,7%, *Galium aparine* – 6,9%, *Elytrigia repens*(= *Agropyron repens*) – 4,2%, *Apera spica-venti* – 3,8% and so one. Similar weed spectrum was found in potato growing region, too. Winter wheat shedding reached 7,4% of growing areas of winter rape, *Capsella bursa-pastoris* – 6,8%, *Thlaspi arvense* – 6,8%, *Elytrigia repens* (= *Agropyron repens*) – 2,3%, *Anthemis arvensis* – 1,4%, *Galium aparine* – 0,2%, *Tithymalus helioscopia* (= *Euphorbia helioscopia*) – 0,2%.

High occurrence of *Tripleurospermum perforatum* (= *Matricaria inodora*) – 30% and *Anthemis arvensis* – 30% was listed in maize growing region in the year 2000. *Cirsium arvense* was founded at 4% growing areas. Similar situation in weediness was in sugar beet growing region. Significantly decreasing of weediness was observed in potato growing region. *Apera spica-venti* was founded at 4% and *Elytrigia repens*(= *Agropyron repens*) at 2% growing areas.

Table 1 Weed infestation of winter rape in Slovak republic in 1998-2000 years (in % - BAYER - CODE)

Years	1998			1999			2000		
Growing region (g. r.)	maize g. r.	sugar beet g. r.	potato g. r.	maize g. r.	sugar beet g. r.	potato g. r.	maize g. r.	sugar beet g. r.	potato g. r.
< 5%				STEME MATIN	APESV AGRRE	GALAP EPHHE AGRRE ANTAR	CIRAR		APESV AGRRE
5 – 10%	ANTAR				GALAP	CAPBP THLAR TRIAE		GALAP	
10 – 15%			CAPBP	TRIAE	ANTAR				
15 – 20%	TRIAE				HORVU				
20 – 30%	CAPBP MATIN						MATIN ANTAR		
> 30%		TRIAE (3)						ANTAR MATCH	

Notes: AN TAR – *Anthemis arvensis*, (O); TRIAE(3) – *Triticum aestivum*, (winter wheat - K); CAPBP – *Capsella bursa-pastoris*, (O); MATIN – *Matricaria inodorum*, (O); STEME – *Stellaria media*, (O); APESV – *apera spica-venti*, (O); AGRRE – *Agropyron repens*, (TPK); GALAP – *Galium aparine*, (O); HORVU – *Hordeum vulgare*, (winter barley - K); EPHHE – *Euphorbia helioscopia*, (THK); THLAR – *Thlaspi arvense*, (O); CIRAR – *Cirsium arvense*, (TPK); MATCH – *Matricaria chamomilla*, (O)

O – winter weed species; TPK – shallow root perennial weed species; THK – deep root perennial weed species; K – crops as weeds; TRIAE (3) – 3rd degree (EWRS) – middle weed infestation

Discussion

Winter rape has a special position in regulation of weed occurrence. It takes place after winter cereals in crop rotations in majority cases (winter barley, winter wheat). It is giving possibility for higher composition of winter one year weed species, e. g. *Tripleurospermum inodorum* (= *Matricaria inodora*), *Galium aparine*, *Apera spica-venti*, *Thlaspi arvense*, *Capsella bursa-pastoris* and so one. Ontogenesis of this weeds is approximated to ontogenesis of winter rape (Aldrich – Kremer 1997).

Winter rape has good competition ability to weeds, which are no tolerant to stand shadowing in vegetation period. Intensive pre-sowing soil treatment damages root systems compactness of weeds with vegetative propagation, e. g. *Elytrigia repens* (= *Agropyron repens*), *Cirsium arvense* and so one (Černuško et al. 2000).

The basis of mechanical regulation of weed infestation is early and quality made stubble ploughing. Stubble ploughing is very suitable for regulation of forecrop shedding, usually cereal shedding. After forecrop harvest is very short time to sowing winter rape (14-21 days). Stubble ploughing is possible to make in good rainfall conditions only, which are suitable for germination and emergence of cereal shedding. In rainfall deficit conditions (which are so often in Slovakia, as in 2000 year), it is more effective shedding placement into the soil, e. g. by shallow tillage (Pikula et al. 1999, Líška et al. 1995).

References

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