

OILSEED RAPE CROP IN ROMANIA: TECHNOLOGICAL ALTERNATIVES FOR WEED CONTROL

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Abstract

Weeds competition represents an important issue for oilseed rape crop and also a restricting factor in obtaining a cost-effective production. In order to control the weeds in oilseed rape crops the farmers can choose today from various technological alternatives, flexible to concrete situations of their own rape area, out of which an important role is the use of herbicides. As have been demonstrated by worldwide researchers the use of plant protection products is one of the most important ways of protecting plants, agricultural production improving and protection of plant products against the harmful organisms including weeds.

By analyzing the offer of herbicides products on the Romanian market during last years, it can be noted the existence of a total of 19 registered active ingredients for weed control in oilseed rape crop. These herbicides are mainly focused on weed control by using them in crop post emergency.

Key words: oilseed rape; weed control; herbicides

In recent years, oilseed rape crop occupied larger and larger areas and continue to increase, what gives these crops second place in the structure of oilseed crops in Romania.

An important limiting factor for obtaining profitable production in oilseed rape crop is weed competition. For weed control in rape crops farmers have today at their disposal various technological alternatives, adaptable to concrete situations of their own sole, among which an important role is the use of herbicides.

The recommendations for achieving effective control of weeds in rape crop concerns the application of an integrated complex of measures including both agricultural and mechanical methods and chemical ones. Chemical control of weeds in this crop became a necessity more and more urgent, due to infestation with a very diverse range of dicotyledons and monocotyledons weeds, some of which are difficult to control, as they are part of the same botanical family (A. Popescu, 2011).

Rape is a sensitive plant to weeds coming up early in the autumn, which make the lack of control "in time" of weeds and their development in culture, leading to yield loss.

MATERIAL AND METHOD

This paper analyzes the presence of the herbicides on Romania's market in order to provide a balanced view of pesticides solutions for weeds control in oilseed rape crop. For this purpose the herbicides data used in this analysis are official data of the National Phytosanitary Agency. During 2012 was also collected information from a total number of twenty oilseed rape growers from South and South-East areas of Romania. In these regions the interviews were conducted in the most important oilseed rape cultivated areas: Călărași, Ialomița, Giurgiu and Teleorman for South region and Constanta, Brăila, Tulcea for South-East region. The interview's purpose was to identify in the mentioned regions the weed species in oilseed rape crop, their presence being noted by percentage.

RESULTS AND DISCUSSIONS

In order to achieve an effective control of weeds in oilseed rape it should be given importance to each control alternative by taking into account the majority presence of the weeds in each field. The weeds present in rape crop are for both classes monocotyledons and dicotyledons. First ten common weeds in rape crop in the South-

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East and Southern region of Romania are presented in the table 1.

Among grasses weeds in the studied regions it can be observed a dominant of annual weeds such as *Echinochloa* and volunteer cereals, weeds founded in 70 - 80% of cases. Compared with grasses species, out of ten main weeds the number of broadleaf weed species is higher. Among broadleaf weeds group, most common are species like: *Matricaria*, *Capsella*, *Chenopodium*, *Cirsium*, *Papaver*, *Raphanus*, *Sinapis* and *Thlaspi*.

Table 1
The frequency of top ten common weeds in rape crop

Latin name	Common name	Weeds frequency (%)	
		South-East region	South region
Grasses weeds			
"Volunteer cereals"	Volunteer cereals	75	70
<i>Echinochloa crus-galli</i>	Barnyard grass	80	85
Broadleaf weeds			
<i>Capsella bursa-pastoris</i>	Shepherd's-purse	90	95
<i>Chenopodium album</i>	Fat-hen	85	90
<i>Cirsium arvense</i>	Thistle, creeping	70	80
<i>Matricaria chamomilla</i>	Mayweed	95	95
<i>Papaver rhoeas</i>	Poppy, common	85	75
<i>Raphanus raphanistrum</i>	Wild radish	50	65
<i>Sinapis arvensis</i>	Charlock	85	80
<i>Thlaspi arvense</i>	Pennycress, field	85	85

Regarding the structure of weed species present in the South and South-East regions from the total weedy area the rate of 30-35% was occupied by grasses, among them the most important being volunteer cereals (25%) and barnyard grass (5 to 10%).

Among broad-leaved weeds from South-East, the proportion of *Cirsium* is for 15% from the total weedy area being followed by *Brassica* species with 35%.

From the total weeds present in the crop the structure of weed species for South is more or less similar to that of the South-East area (Table 2).

For South-East area, from the total interviews conducted the weeds had showed a proportion of 75% presence in oilseed rape crop, out of which 30% coverage of grasses weeds and the remaining 70% of broadleaf weeds.

Table 2

Weed species structure from the total present weeds

Latin name	Common name	Weeds structure (%)	
		South-East region	South region
Grasses weeds			
"Volunteer cereals"	Volunteer cereals	25	25
<i>Echinochloa crus-galli</i>	Barnyard grass	5	10
Broadleaf weeds			
<i>Capsella bursa-pastoris</i>	Shepherd's-purse	10	5
<i>Chenopodium album</i>	Fat-hen	15	10
<i>Cirsium arvense</i>	Thistle, creeping	10	15
<i>Matricaria chamomilla</i>	Mayweed	10	10
<i>Papaver rhoeas</i>	Poppy, common	5	10
<i>Raphanus raphanistrum</i>	Wild radish	5	5
<i>Sinapis arvensis</i>	Charlock	10	5
<i>Thlaspi arvense</i>	Pennycress, field	5	5

For the South area the rape crop showed a high presence of weeds for 80%, the proportion of broadleaf weeds being 65% and 35% for grass weeds. We can conclude that in counties of Southern and South-East the weeds spectrum and weeds presence are similar, without any major differences (Table 3).

Table 3

Degree weeds presence in the rape crop

	South-East region (%)	South region (%)
Total species, out of which:	75%	80%
- grasses weeds	30%	35%
- broadleaf weeds	70%	65%

Based on the results of interviews, it has been analyzed the offer of registered plant protection products in Romania which could provide an image of existing alternatives for control of the main weeds found in oilseed rape crop.

In this regard the registered active substances for the main weeds founded are shown in the table 4.

In autumn, through annual dominant weeds we have *Brassica* species and through perennial weeds we have thistles for which can be seen in table 4 the existence of a small number of products. Today there are few complete alternative technologies and most of the farmers apply a specific treatment to control grasses and one or two treatments for broadleaf weed control.

Table 4

Registered active ingredients for weeds control in oilseed rape

Active ingredient	Volunteer cereals	<i>Echinochloa crus-galli</i>	<i>Capsella bursa-pastoris</i>	<i>Papaver rhoeas</i>	<i>Raphanus raphanistrum</i>	<i>Matricaria spp</i>	<i>Thlaspi arvense</i>	<i>Chenopodium album</i>	<i>Sinapis arvensis</i>	<i>Cirsium arvense</i>
aminopirialid 40 g/l+ clopiralid 240g/l + picloram 80 g/l	-	-	X	X	X	X	X	X	-	X
cicloxdim 100 g/l	X	X	-	-	-	-	-	-	-	-
cletodim 120 g/l	X	X	-	-	-	-	-	-	-	-
clomazon 480 g/l	-	-	X	X	X	X	X	X	-	-
clomazon 40 g/l + dimetaclor 500 g/l	X	X	X	X	X	X	-	X	-	-
clopiralid 267 g/l c + picloram 67 g/l	-	-	-	X	-	X	-	X	-	X
clopiralid 300 g/l	-	-	-	-	-	X	-	X	-	X
dimetaclor 500 g/l	X	X		X		X		X	-	-
dimetenamid-P 200 g/l +metazaclor 200 g/l + quinmerac 100 g/l	X	X	X	X		X	-	X	-	-
etametsulfuron 75 g/kg	-	-	X	X	X	X	X	X	X	X
fenoxaprop-P-etil 75 g/l	X	X	-	-	-	-	-	-	-	-
fluazifop-P-butil 150 g/l	X	X								
imazamox 17,5 g/l + metazaclor 375 g/l	X	X	X	X	X	X	X	X	X	X
metazaclor 500 g/l	X	X	X	X	X	X	-	X	-	-
napropamid 450 g/l	X	X	-	-	-	-	-	X	-	-
Propaquizafop 100 g/l	X	X	-	-	-	-	-	-	-	-
quizalofop-p-etil 50 g/l	X	X	-	-	-	-	-	-	-	-
quizalofop-P-tefuril 40 g/l	X	X	-	-	-	-	-	-	-	-
S-metolaclor 960 g/l	X	X	-	-	-	-	-	X	-	-

x = control

„-“= no control

The herbicide’s purpose acting on the local market is to control weeds competition below the economic threshold.

The rape sensitivity to early weeds competition as well as the use of herbicides on crop is raising questions to farmers regarding the optimum timing of weeds control. Today, for controlling the weeds by herbicides application the farmers have two main options regarding the best timing of application namely the pre emergence and post emergence use.

From the total herbicides registered in Romania for oilseed rape weed’s control, 71% are post emergence application herbicides, 16% pre emergence application herbicides and only 13% are flexible mixture that can be applied in the pre emergency as well as in the post emergency (figure 1).

For mixtures with mainly action pellicular it is very important the applying time. The early application, shortly after weed emergence, during cotyledons stage up to 4 leaf stage ensures the maximum efficacy.

The common practice is to remove the pressure of grass weeds competition especially of volunteer cereals in autumn and to move the control of broad leaves weeds in spring.

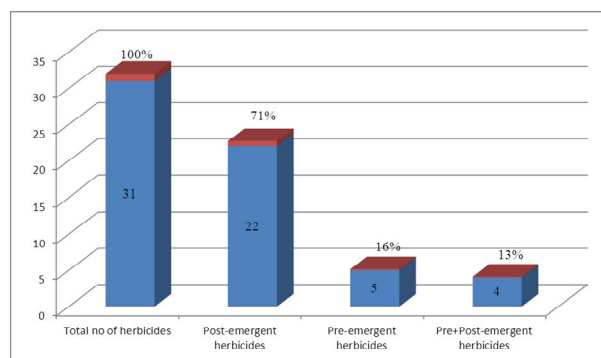


Figure 1 Number of approved herbicides for oilseed rape weeds controls in Romania

Although the reasoning is easy to understand and even to accept the risk related to crop survival until spring, no weed control in early autumn, raise problems such as: intraspecific competition due to many *Brassica* weeds; increase the reserve of

seeds with significant influence in programs to control rotating crops; strong attack of pests and diseases that have broad support development in *Brassica* weeds species present in the crop; and not least the crop contamination with seeds impossible to be separated, species as wild mustard and wild radish which have direct consequences on harvest quality.

CONCLUSIONS

Market presence of registered herbicides for rape crop demonstrates on the one hand, the importance of weed control by chemical methods, and on the other hand the crop's importance which sustains the need for application by farmers of new technologies in plant protection field.

The weeds present in rape crop are both grasses weeds and broadleaf weeds. In South and South-East counties, the weeds spectrum and weeds presence are similar without identifying major differences.

Grasses weeds in oilseed rape crop can be easily controlled taking into account the existence of a reasonable number of registered herbicides for this purpose. More difficult to control are broadleaf

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