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THE REGULATION OF GROWING WEEDS OF THE WINTER OILSEED RAPE CROPS

In this article are shown the results of researches of weeds growing controlling at winter oilseed rape crops. The usage at the crops the combined system of protection from weeds provides efficiency at the level - 90,7%, sprouts-85,5%. The growing of winter canola for seed in case of using the proposed protection systems allow you to get clean and safe products.

Keywords: *weeds, weediness, herbicides, winter oilseed rape, the crop yield*

The plants of rape, especially winter, in comparison with other cultures, have much more competitive activity against weeds. In case of observing the growing technology, first of all, the soil cultivation system, the sowing dates, the thickness of growing plants, the fertilization and plant protection systems, oilseed rape creates a large ground mass, its' plants can effectively suppress weeds independently, especially in the second half of the growing season.

The protection of winter oilseed rape from weeds is an important and obligatory element in intensive culture cultivation technology. An important step is the ensuring of favorable conditions for the germination of winter oilseed rape without competition from weeds. So as the weediness of crops cause the decreasing of yield at 25-30% for continuous crops and 40-80% wide rows [1, 2]. At this level of potential weediness it is necessary to use widely the chemical protection remedies in order to preserve the harvest.

However the irrational using of herbicides may cause pollution. In this context, the developments of highly efficient and environmentally safe technologies of struggle against weeds are especially important.

The aim of research: the justification of effective and environmentally safe control of weeds' plants in winter oilseed rape crops.

Materials and methods. the research conducted during 2011-2013 at the Institute of feed research and Agriculture of Podillya NAAN, which is located in the Right-bank Forest Steppe of Ukraine with the sufficient moisture, which characterized by the sum of active temperatures (over 10 ° C above zero) 2620-2780 10 ° C, the duration of the growing period 200-205 days, frost-free period - 155-165 days. The amount of rainfall per year ranges from 550 to 670 mm.

The soils of experimental field - gray forest mediumloamy ashed soils prone to water covering and crust formation. The cultivable humus content of 0-30 soil layer cm 1,8-2,4%.

The weather conditions during the study were generally favorable for plant growth and development of winter oilseed rape.

The scheme of the experiment is given in Table 1.

The experiment embedded in a four-fold repetition of the accounting area 25 m². The sowing of winter oilseed rape was carried out in the third decade of August by sort of Black Giant. The herbicides adding was carried by knapsack sprayers, consumption rate of the working fluid was at the rate of 200-300 l / ha according to the scheme of the experiment.

For the growing season were conducted the observations and counts according to the conventional techniques [3, 4, 5].

Results and discussion. The winter oilseed rape though is a competitive culture, but in many cases needs to be protected from weeds. Weediness of crops especially early in the growing season leads to a reduction of seed yield by 25-40% or more.

Due to the field researches was set the species diversity of weeds plants in crops of winter oilseed rape. In crops met the following types of weeds: common chickweed (*Stelaria media* (L.) Vill), shepherd's-purse (*Capsella bursa-pastoris* (L.) Medicus), cleavers (*Galium aparine* L.), field

pansy (*Viola arvensis* Murr.), scentless mayweed (*Matricaria inodora* L.), mieldweed (*Chenopodium album* L.), redroot pigweed (*Amaranthus retroflexus* L.), dull-seed corn-bind (*Polygonum convolvulus* L.), curltop lady's-thumb (*Polygonum lapathifolium* L.), creeping thistle (*Cirsium arvense* L.), perennial sowthistle (*Sonchus arvensis* L.), yellow foxtail (*Setaria glauca* (L.) Pal. Beauv), cockspur grass (*Echinochloa crus-galli* (L.) Pal Beauv).

Under the conditions of using herbicide for young plants Halera 334. SL, v.r. rate of 0.3 l/ha + 12.5% zelek super, k. 1.0 l/ha the death of young weed plants was on the average at 85.5%. The using of lower standards of herbicide Halera 334. SL v.r. to 50% leads to decreasing in drug action to 15.1% and the efficiency to 75.6% in comparison with combined protection system. So as some of the young weed plants survived after spraying and continued vegetation in crops plants (Fig. 1).

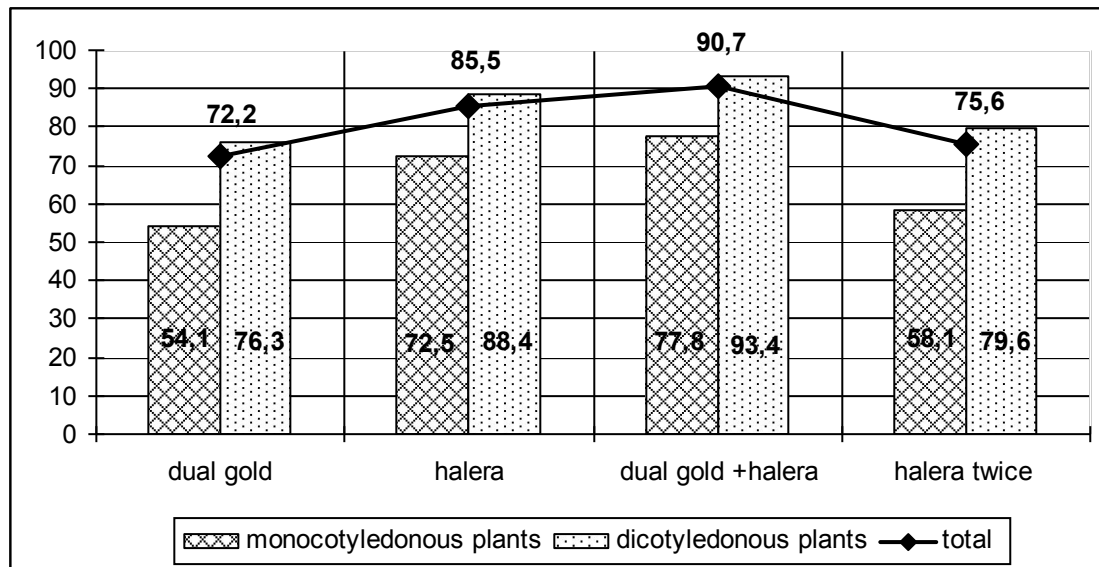


Fig. 1. The weediness of rape crops according to variants of defending plants, on the average for 2011-2013 years

According to the researches it was found that a weediness of oilseed rape crops were high. Adding the herbicides reduced a negative impact of weeds to the crops of the plant that have a positive impact on the conservation of the yield of winter oil seed rape, which has increased by 0.6-1.5 t/ha or 40-100% in comparison to weediness control.

The spraying of the crops by soil herbicides Dual Gold 900 EC, k. e. before the sowing of winter rape with norm of use 1.6 l/ha, helped in the reduction of the total number of weeds and consequently increase the yield of winter rape by 0.6 t/ha or by 40.0% in comparison with the variant without the crop protection.

The best one was the system of protection of the crops against the weeds, which provides the application of herbicide Dual Gold 900 EC, k. e. with consumption rate 1.6 l/ha into the soil before germination of sprouts + herbicides to sprouts Halera 334. SL, v. r. 0.3 l/HA + zelek Super 12.5%, k. e. 1.0 l/ha that provide a maximum yield of winter rape at a level of 3.0 t/ha, which is at 100% higher than variant without a protective measures (table 1).

The slightly lower rates of the yield of winter rape grain were received under the conditions a herbicide spraying of crops to sprouts (Galera 334. SL, v. r. the norm of using 0.3 l/ha + zelek Super 12.5%, k.e. the norm of using 1.0 l/ha), the increase was 1.1 t/ha, or 66,7%.

The using of sprout herbicide (Halera 334. SL, v.r.) in reduced norm made it possible to obtain a yield level 2,3 t/ha.

This version of protection was almost equivalent with using only soil herbicide Dual Gold 900 EC, k.e. Reduction the norm of using the herbicide Halera 334. SL, v.r. to 50% causes surviving of the weeds sprouts and those led to the weediness of crops and consequently decrease the yield of winter rape.

The protection of winter rape from weeds through the using of the proposed options was cost effective as evidenced by the results of calculations.

The production costs for growing winter rape through the use of sequential application of soil herbicides Dual Gold 900 EC and 334 sprouts Halera SL, v.r. was to 6.5 thousand /ha, which is at 0.9 thousand/ha more than in weediness controlled crops. Funds spent to the crops protection from weeds provide the profit at the level of 5.3 thousand/ha at profitability of 81.6%.

The using of the atsprouts protection system from weeds such as introduction of herbicide Halera 334 SL, v. r., full and reduced norm, requires about 6.1 thousand hrn/ha production costs. At the crops with this protection system was obtained from 2.9 to 4.1 thousand UAH/ha profits at the level profitability 47.6-67.3%.

Table 1

The productivity and economic efficiency of winter oilseed rapeseeds' cultivation in different systems of crops' protection from weeds, average for 2011-2013 years

| № variants | The name of the variants | Figures | | | |
|------------|--|-------------|-------------------------------------|--|------------------------|
| | | yield, t/ha | production costs, thousands, hrn/ha | shareware-netprofit, thousands, hrn/ha | profitability level, % |
| 1. | Weediness control | 1,5 | 5,6 | 0,3 | 5,4 |
| 2. | Dual gold 1,6 l/ha + Zelec super 1,0 l/ha. | 2,1 | 6,0 | 2,3 | 38,4 |
| 3. | Halera 0,3 l/ha + Zelec super 1,0 l/ha. | 2,6 | 6,1 | 4,1 | 67,3 |
| 4. | Dual gold 1,6 l/ha + Halera 0,3 l/ha + Zelec super 1,0 l/ha | 3,0 | 6,5 | 5,3 | 81,6 |
| 5. | For using: a) Halera 0,15 l/ha; 6 Halera 0,15 l/ha + Zelec super 1,0 l/ha. | 2,3 | 6,1 | 2,9 | 47,6 |

The application of chemical protection at crops of winter rape is an integral part of growing culture and a pledge to get a high yield. The using of herbicides has turned into a permanent factor that has both positive and negative effects. Therefore, it is necessary to take account of their after-mandatory during the development of certain technologies, and to determine the prospects for the development of chemical methods of plant protection.

At the end of the winter rape growing season by the years of researches was made an analysis of the content of residual herbicides in crops' seeds and soil (Table 2).

The analysis of pesticide residue content in seeds of winter rape and in soil on average for years of researches showed their absence during the harvesting of crops. The using of herbicides Dual Gold 960 EC, k.e., Halera 334. SL, v.r. and zelek super, 12.5% of k.e. in recommended and diminished standards for application on winter rape crops are safe for humans and the environment.

So the winter rape growing for seed with weed protection systems that were that were used in the experiment allow to get the products environmentally clean and safe.

Table 2

**The residues herbicides contents in soil and grain of winter rape,
average for 2011-2013 years**

| The name of variants | The using norm of herbicides | The date of using | The residues herbicides contents, mg/kg | | GDN, mg/kg | |
|----------------------|------------------------------|--|---|-------|------------|-------|
| | | | soil | grain | soil | grain |
| Weediness control | - | - | 0 | 0 | 0 | 0 |
| Dual gold | 1,6 l/ha | III Decade of August, I Decade of September | 0 | 0 | na | 0,4 |
| Zelec super | 1,0 l/ha | III Decade of April | 0 | 0 | 0,2 | ap |
| Halera | 0,3 l/ha | III Decade of April | 0 | 0 | 0,05 | ap |
| Zelec super | 1,0 l/ha | | 0 | 0 | 0,2 | ap |
| Dual gold | 1,6 l/ha | III Decade of August, I Decade of September | 0 | 0 | na | 0,4 |
| Halera | 0,3 l/ha | III Decade of April | 0 | 0 | 0,05 | ap |
| Zelec super | 1,0 l/ha | | 0 | 0 | 0,2 | ap |
| Halera | 0,15 l/ha | III Decade of April | 0 | 0 | 0,05 | ap |
| Halera | 0,15 l/ha | I-II Decade of May | 0 | 0 | 0,05 | ap |
| Zelec super | 1,0 l/ha | | 0 | 0 | 0,2 | ap |

na – not allowed

ap – on approving

Conclusions. The using for winter rape crops combined protection system from weeds provides efficiency at the level 90.7%. The spraying of crops by atsprouts herbicides reduces crops weediness to 85.5%.

The analysis of pesticide residue content in seeds of winter rape and in soil on average for years of researches showed their absence during the harvesting of crops. The using of herbicides Dual Gold 960 EC, k.e., Halera 334. SL, v.r. and zelek super, 12.5% of k.e. in recommended and diminished standards for application on winter rape crops are safe for humans and the environment.

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Анотація

Чернелівська О. О.

Регулювання забур'яненості посівів ріпаку озимого

У статті наведені результати досліджень контролювання забур'яненості посівів озимого ріпаку. Застосування на посівах комбінованої системи захисту від бур'янів

забезпечує ефективність на рівні 90,7%, посходової - 85,5%. Вирощування ріпаку озимого на насіння за умов використання запропонованих систем захисту дають змогу отримати екологічно чисту і безпечну продукцію.

Ключові слова: бур'яни, забур'яненість, гербіциди, озимий ріпак, урожайність

Анотація

Чернеливская Е. А.

Регулирование засоренности посевов рапса озимого

В статье приведены результаты исследований относительно контролирования засоренности посевов рапса озимого. Применение на посевах комбинированной системы защиты от сорняков обеспечивает эффективность на уровне 90,7%, посходовой – 85,5%. Выращивание рапса озимого на семена при условии применения предложенных систем защиты дают возможность получить экологически чистую и безопасную продукцию.

Ключевые слова: сорняки, засоренность, гербициды, озимый рапс, урожайность