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# IMPROVEMENT OF CHEMICAL CONTROL METHOD FOR ACROPTILON REPENS IN ODESSA REGION

*The article highlights rational methods of control of Acroptilon repens. It was shown that application of herbicides with biopolymer Liposam provides reduction of herbicidal load in 2 times while maintaining high efficiency (97,1-99,1 %).*
***Keywords:*** *Acroptilon repens, herbicides, biopolymer Liposam*

**Introduction.** Modern technologies of cultivation crops foresee obligatory use of herbicides. Experience of ground herbicides use shows that these herbicides can control only annual weeds. As for perennial ones, the most effective control technology for them is system herbicide use. However, use of these herbicides in recommended utilization standards (they are mostly high – 4-8-10 l/ha) increases pesticide load and makes them unprofitable [8].

Implementation of new technologies for crop growing requires use of more innovative methods in plant protection from quarantine weeds. Thus, pest control against such weed as Acroptilon repens should be realised purposefully taking into account biology of its development [2, 4].

Acroptilon repens is one of the most hardly uprooting poisonous quarantine weeds which through its great littering ability due to lack of competition, fully supplants other plants and significantly (45-75 %) or entirely destroy crops. It quickly spreads owing to its biological properties as well as perfect apparatus of reproduction. It is more stable in the fields than other weeds. These are reasons for: higher draught resistance; ability to bear thickened soils; presence of particularly branched rootage that penetrates deeply into soil; high regeneration ability and vegetative reproduction; ability to suppress and supplant not only cultural plants but other pest weeds [10].

Having significant store of agrotechnical means, we cannot fully solve the problem of Acroptilon repens control for the present. In every case agrotechnical means of control should add to chemical ones.

Both foreign and home practice proves that it is necessary to make a bet in the fight against this hardly uprooting weed on improvement of chemical means [5, 9]. The most effective method of quarantine weed control is chemical means with use of high efficient modern herbicides. Most of soil herbicides recommended for different field crops act rather weakly upon Acroptilon repens. So, to destroy Acroptilon repens on fields during after the harvest period, on road sides and non-agricultural lands system herbicides of continuous action should be used, that is ones of Glyphosate group which not only destroy overground mass but penetrate easily to rootage.

Glyphosate derivatives have a wide range of actions, high economical efficiency, they are rather effective on vegetative actively developed Acroptilon repens at absence of culture, quickly bind with soil, are destroyed by soil microorganisms [6, 9].

Together with development and use of herbicides it is necessary to use such preparations that can strengthen and provide effective action of protective chemicals and maybe lessen consumption rate of the preparation and working solution. To strengthen herbicide it is possible with help of surfactants (adjuvant, adhesives) [1, 3].

Taking into consideration nowadays' requirements it is necessary to seek and create new alternative methods of solving this problem. The purpose of this study was development and introduction of effective system of Acroptilon repens chemical control in Odessa region.

**Materials and methods.** Research object was quarantine weed – Acroptilon repens. Place of testing: Odessa region, TOV «Agrofirma Marianivska» Shiriaevskiy district. Soil was heavy

loamy chernozem, humus content 3,1-3,3 %, pH – 7,0-7,2. Type of research – production, area of accounting plot – 0,5 ha.

Meteorological conditions of vegetative period 2012-2013: average of many years rainfall data per year – 430 mm, during the test years from the start of study there fell 138,9 mm, that is 65,5 % from the climatic norm for this period (212 mm). Air temperature: average of many years 19,1°C; during the test period – 23,7°C. Relative humidity was within the norm – 65,3 %, data of many years for this period – 64,6 %.

Observation of Acroptilon repens growth dynamic and development carried during 2011-2013 years enabled us to determine optimal terms of herbicide application. The most vulnerable phase of Acroptilon repens development when herbicides can destroy not only overground mass but penetrate to rootage is stooling and bud formation.

To lessen herbicide load we added adhesive Liposam into working solution; composition of the adhesive: composition of polysaccharides of natural origin, manufacturer – PP «BTK-Center», Ukraine.

Experiment on herbicide efficiency determination at adhesive Liposam presence against Acroptilon repens in working conditions started at the beginning of June in period of stooling and bud formation, at that plant height was 15-20 cm on the adjacent plots of corn field. Spraying was made directly onto vegetating plants of Acroptilon repens by means of tractor boom sprayer ONS-600 equipped with protective screens to cultural plants from working solution. The working solution consumption norm is 300 l/ha, repetition – triple. Before spraying we calculated output infestation on 10 plots of size 50x50 cm in each repetition the experiment variant.

Scheme of field experiment of Acroptilon repens amount control:

1. Control – without spraying
2. Roundup Max 607 (model) – 6,0 l/ha
3. Roundup Max 607 + Liposam – 3,0+1,5 l/ha
4. Uragan Forte 50% + Liposam – 2,0 + 1,5 l/ha

Calculation and estimation of herbicides and their mixture efficiency were realized according to «Methods of testing and application of pesticides» [7].

**Results and discussion.** Results of comparative efficiency of mixtures Uragan Forte, 50 % with Liposam at rate of consumption - 2,0+1,5 l/ha and Roundup Max 607 with Liposam at rate of consumption – 3,0+1,5 l/ha were significant and showed that such combination didn't result in decrease of their pesticide activity.

Thus, during a month the test plots remained almost clean. Efficiency at that time was 98,7-99,1 %, that was practically at the level of the standard of Roundup Max 607 at rate of consumption – 6,0 l/ha – 99,8-100 %.

It should be noted that significant signs of depression (loss of turgor, stoppage of plan development) were noticed on the plots treated with herbicides some days after spraying, and two weeks after treating the over ground part weed was entirely dead.

Slight regrowth of Acroptilon repens was observed on the test plots at the end of vegetation. Technical efficiency was at the level of 97,5 % with the variant Uragan Forte 50 % + Liposam (2,0+1,5 l/ha), and with the variant Roundup Max 607 + Liposam (3,0+1,5) it was within range 97,1 %.

An important index of herbicide action on perennial weeds is percentage of its dead roots and rhizomes. So, at the end of vegetation period we made calculations of roots and rhizomes on the test and control plots. Calculations during the excavations in September showed that the highest percentage dead roots and rhizomes was reached with application of Roundup Max 607 (model) at maximal rate of consumption – 6,0 l/ha – 85,9 %. Variants with application of herbicide mixtures with Liposam showed that mass of roots and rhizomes of Acroptilon repens decreased by – 74,8-80,9 % respectively as compared with infested test plots.

**Conclusion.** So, results of the experiments indicate that use of such control methods enable us to reduce norms of herbicide consumption in 2 times through the use of adhesive Liposam (PAR)

in mixture with herbicides. This reduced herbicide activity and guaranteed economic security of the herbicide application.

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### *Анотація*


***Чебановска А.Ф.***

***Удосконалення хімічного методу контролю гірчака повзучого в одеській області***

*Наведено раціональні методи контролю гірчака повзучого. Встановлено, що використання прилипала Ліпосама в суміші з гербіцидами забезпечує зниження гербіцидного навантаження в 2 рази при збереженні високої ефективності (97,1-99,1 %).*



***Ключові слова:*** *гірчак повзучий, гербіциди, прилипач Ліпосам*


### *Аннотация*


***Чебановская А.Ф.***

***Усовершенствование химического метода контроля горчака ползучего в Одесской области***

*Приведены рациональные методы контроля горчака ползучего. Установлено, что применение прилипателя Липосама в смеси с гербицидами обеспечивает снижение гербицидной нагрузки в 2 раза при сохранении высокой эффективности (97,1-99,1 %).*



***Ключевые слова:*** *горчак ползучий, гербициды, прилипатель Липосам*