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MONITORING OF SWALLOW-WORT IN AGRICULTURAL CROPS

The results of the studies about the effectiveness of influence of herbicides on sugar beet and winter wheat crops of swallow-wort annual seedlings, that sprouted from seed are highlighted in the article.

***Keywords**: Swallow-wort, herbicides, effectiveness of influence, sugar beet, winter wheat.*

Introduction. One of the most pressing problems of receiving high yields of agricultural crops is the development and improvement of measures which are directed to limit the dissemination and harmfulness of weeds, especially perennial weeds. They complete continuously with cultivated plants in fighting for water and nutrients. For many hundreds of years the weeds have well-adapted to the existence conditions: much better than cultivated plants they are drought and frost tolerant, grow often at lower temperatures and use less water from the soil for seed germination [3].

Among a wide variety of weed species the highest level of negative influence on cultivated crops have perennial weeds. In addition to native species a potential place among perennials weeds occupies alien species – swallow-wort (Asclepias syriaca L.) [2].

Swallow-wort, as is well-known, is anemochoric plant, that is a plant that distributes its seeds using jets of air. Weed seeds has a special silky white pappus in the shape of an umbrella (Fig. 1).

Such form of swallow-wort fruit ensures a high sailing capacity, notably the ability to transport by wind over long distances from a few tens of meters to tens of kilometers. The ability of weeds to spread creates a great danger for such weed

colonization over large areas of arable lands. Moreover swallow-wort seeds germination is 95-98%.

Fig. 1. Swallow-wort seeds

In accordance the pressing question becomes the effective monitoring of the process of weeds distribution and rooting it in new territories.

Research methodology. In the unstable wetting areas, namely in «Svyatoslav» farm of Kyiv region in the years of 2010-2012 the studies were conducted. Agrochemical characteristic in 0-30 cm of soil layer in concrete area, where the experiments were laid down is the following: humus content – 3,4%, easily hydrolysable nitrogen content – 129 mg/kg of soil, mobile phosphorus – 151-158 mg/kg of soil, exchangeable potassium – 86-94 mg/kg of soil, pH level of saline solution – 6,3. Plot area is 25 m^2. Number of replications is fourfold. Preparations were applied by hand sprayer Stihl SG-20. Weeds accounting performed by imposing along the diagonal of plot the four frameworks of a size 50x50 cm. The experiments were laid down according to the methodology of testing and pesticides application [1] and provided the sugar beet crops and winter wheat impact assessment of herbicides to the swallow-wort germination that sprouted from seeds (Table 1).

Table 1

Norms of herbicides application on agricultural crops

Sr.No.	Crop	Preparation name	Consumption rate of preparation, l/ha
1	Sugar beet	Bitseps Garant, emulsion concentrate (fenmedyfam 90 g/l + desmedyfam 70 g/l + etofumezat 110 g/l)	2,00
2	Winter wheat	Starane 250, emulsion concentrate (250 g/l fluroksypir)	0,80

Fig. 2. Swallow-wort plants

The assessment of effectiveness of herbicides impact on swallow-wort plants carried out in such phase of weed plants development: phase of cotyledons, 2 leaves, 4 leaves, 6 leaves, 8 leaves.

Research results. In winter wheat crops the swallow-wort annual seed germination in the interstage period of cotyledon – 6 leaves (Fig. 2) may be controlled by using herbicide Starane 250, emulsion concentrate in 0,8 l/ha norm, effectiveness of such herbicides influence was 88,4-100% in the indicated phases of development (Table 2).

Table 2

Effectiveness of herbicides influence on swallow-wort annual plants in agricultural crops, «Svyatoslav» farm, average of 2010-2012

Sr.No.	Phase of swallow-wort development	Effectiveness of herbicides influence on swallow-wort annual plants in agricultural crops, %	
		Sugar beet: Bitseps Garant, emulsion concentrate 2,0 l/ha	Winter wheat: Starane 250, emulsion concentrate 0,8 l/ha
1	cotyledons	98,7	100
2	2 leaves	54,3	100
3	4 leaves	29,8	98,6
4	6 leaves	-	88,4
5	8 leaves	-	53,2

For the timely implementation and seedlings identifying of swallow-wort in the phase of cotyledon there is a real possibility of its control by chemical method (Bitseps Garant, emulsion concentrate (2,0 l/ha) in sugar beet crops. Effectiveness of influence was on the average 98,7%.

Conclusions. In the presence of swallow-wort seedlings in sugar beet crops they may be effectively enough controled by 90-98% under condition of application of Bitseps Garant, emulsion concentrate in 2,0 l/ha norm not later than phase-forming of cotyledon in weed plants, winter wheat crops – 88,4-100% under condition of application of Starane 250, emulsion concentrate in 0,8 l/ha norm, in phase of cotyledon – 6 leaves.

Being late to conduct protective measures even using the higher consumption rates do not provide a reliable eradication of weed seedlings from seeds in agricultural crops.

The obligatory condition for successful monitoring of swallow-wort in agricultural crops, including sugar beet - is a timely examination of crops with the determination of species composition of weed seedlings in phase of cotyledon in order to the following conduction of protective measures.

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Анотація

Ременюк С.О.

Контролювання ваточника сирійського в посівах сільськогосподарських культур

У статті висвітлено результати досліджень з визначення ефективності дії гербіцидів в посівах буряків цукрових та пшениці озимої на однорічні сходи ваточника сирійського, що проросли з насіння.

Ключові слова: *ваточник сирійський, гербіциди, ефективність дії, буряки цукрові, пшениця озима.*

Аннотация

Ременюк С.А.

Контроль ваточника сирийского в посевах сельскохозяйственных культур

В статье отражены результаты исследований по определению эффективности действия гербицидов в посевах сахарной свеклы и озимой пшеницы на однолетние сходы ваточника сирийского, проросшие из семян.

Ключевые слова: *ваточник сирийский, гербициды, эффективность действия, сахарная свекла, пшеница озимая.*