

ЭКОЛОГИЯ ЖӘНЕ ӨМІР-ТІРШІЛІК ҚАУІПСІЗДІГІ  
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ЭКОЛОГИЯ И БЕЗОПАСНОСТЬ ЖИЗНЕДЕЯТЕЛЬНОСТИ

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REMOVING NOXIOUS WEEDS A.PSEUDALHAGI FOR HIGHWAYS USING  
CHEMICAL MIXTURES

**Abstract.** The removal of unwanted vegetation outside of agricultural land, such as roadsides and railways, is one of the main problems. Ensuring the safety and smooth operation of the transportation process in the railway and motor transport industry depends on the effectiveness of ways to protect the production infrastructure from vegetation. Currently, various herbicides of chemical compositions are used to control weeds. Unfortunately, so far, no herbicides have been found designed to completely destroy plants of this variety. In addition, despite the fact that highly effective herbicides are found, their high degree of toxicity harms representatives of the animal world. The growth of roadside grass, in addition to affecting the quality and safety of the work performed, worsens aesthetic perception and leads to swarming of livestock on verdant plants. This leads to emergencies that threaten the lives of animals. The effect of herbicides to a certain extent depends not only on plant species, but also on natural and climatic conditions, the degree of soil fertility. In regions with arid climates, for example, in the south of Kazakhstan, due to lack of moisture, there is a certain difficulty in destroying plants whose roots extend deep into the earth's crust. In this research work, as a result of experimental work, it was established that it is possible to destroy weeds with chemical mixtures.

**Keywords.** Highway junctions, weeds, chemical pesticides, herbicides, A. Pseudalhagi.

**Introduction.**

Currently, there are several methods of weed control. One of them is the mechanical method. The mechanical method involves cutting the roots of weeds at the base. Instead of using herbicides mechanical weed control measures can be used. In addition, tillage must be irreversible. With the help of several small treatments, you can achieve a very good effect of removing annual and resistant weeds. Additionally, the laying of weed seeds is reduced because weeds and cereals stop the growth process and then are mechanically destroyed. To quickly control the effect of the mechanical removal method, it is recommended to perform a treatment as fine as possible at a maximum depth of 4-5 cm [1].

The physical method. You can also use physical methods instead of herbicides to kill weeds before sowing. Currently, there are approaches such as hot steam treatment or its use. Unfortunately, such thermal methods are characterized by high energy consumption and relatively low productivity. Another problem is that heat can penetrate the ground only a few millimeters. Using this method, it is possible to successfully remove germs, but it does not have sufficient effect against the destruction of deep-rooted weeds [2].

The impenetrability of light through the coating layer. A very effective way to destroy weeds is to cover the soil with light-resistant films or paving stones. If the plant is deprived of light, then sooner or later it will torment. There are already suitable solutions using special

biodegradable films for various types of corn and vegetables. They help suppress weeds, as well as improve soil warming [3]. This method has proven itself not only in gardening but also in growing corn in cool places.

Weeding with intermediate crops. Instead of films, the soil can be covered with fast-growing intermediate crops that can effectively suppress weeds and cereals. Later, the crop is destroyed with selective herbicides [4]. However, this method is associated with a number of problems. That is to obtain a sufficiently high effect in weeding, the crops of intermediate crops must be very dense, homogeneous, and provide good field coverage. In our climatic conditions, the growing season required to include intermediate crops that suppress weeds in crop rotation is insufficient [5].

Herbicides used to kill weeds. In the process of weed control, the most effective is the chemical method, which is currently carried out with the help of highly effective herbicides, in which many weeds do not harm cultivated plants [6].

Modern herbicides are mainly organic compounds that freely and quickly penetrate plant tissues and cells, causing their destruction. When using soil herbicides, the active substance penetrates into the plant through the roots and living tissues of the seedling, coleontil, and when using herbicides during the growing season, through the tissues of the leaves. The first stage of action consists in the fact that chemicals penetrate through the integumentary tissues of plants at the places of contact. The second stage is movement along with the initial products of metabolism and localization in various organs. The third stage is the accumulation of herbicides in certain organs or their destruction into toxic compounds. The basis for the use of herbicides on certain crops is the principle of selectivity of their toxic effect. This is due to the morphological and anatomical structure of plants [7].

Problems with railway weeding. Weeding roads and railways is becoming an increasingly serious problem. The presence of unwanted vegetation on the ballast surface increases railway losses. For best performance, the ballast must be clean. This is due to the fact that the presence of grass on the ballast surface worsens its drainage properties and contributes to contamination with dust and dirt. In addition, plant roots fill the pores in the sand, polluting and clogging them. As a result, the ballast must be cleaned or replaced, increasing the cost of road repairs [8].

Railways cannot randomly spray herbicides because many roads are located next to sensitive plants in fields and in people's yards. Applicators should also be careful not to spray in ditches adjacent to high tracks, as water can accumulate here, and some herbicides can enter groundwater and cause pollution. There is also a geographical problem of weed control along the rails. For this reason, it is most effective to use chemical weed control agents. Chemical weed killers are killed by machines by spraying water-soluble chemicals, various chemical additives, or oils absorbed by plants on plants. This method is very effective. To destroy vegetation in a ballast prism, one or more passages are made from such machines. Chemical vegetation removal is often used both on mainline and on station tracks. Chemical methods of destroying weeds and shrubs are widespread and are increasingly used on roads. Studies have shown that effective chemical formulations, however, affect only some plant species, and some destroy all plants in a row, so they are usually called chemical fry. Some of them are poisonous to livestock, while others are non-toxic [9].

Research on the effects of chemicals that destroy plants has recently expanded, investigating the effects of various chemicals using data from long-term observations, repeated trials, and earlier studies. One of the ways to deal with plants in these studies is care and requires constant attention. Delaying such work leads to overgrowth of the road with grass and the formation of perennial weeds. In addition, studies have shown that a single treatment, even the removal using the most expensive methods, cannot be achieved for the eternal destruction of plants [10-11].

Arsenic compounds are highly effective contact herbicides that are also used as soil sterilizers, but their use requires great caution, as this creates a risk of poisoning livestock, humans, and animals. Sodium chloride is usually considered a highly effective contact herbicide or soil sterilizer, but it is no longer used due to the numerous fires that occur between grasses that have dried up after its use. However, many chemical compounds based on sodium chloride, calcium chloride and boreate can be effective plant control agents. In addition, their use is not flammable and does not cause metal corrosion [12-13].

Absorbent herbicides include all types of chemicals that are absorbed by the conductive tissue (phloem) after application to the leaves of the plant. After treatment with soil sterilizers with some chemicals, the soil remains infertile. Soil depreciation can be temporary, last a year or less, or be calculated for a long period. This is considered a permanent sterilization of the soil. Sterilizers include arsenic, boron, and urea compounds, or oil residues, and sodium chloride with limited use. For these chemicals to work effectively, the roots of plants must completely absorb the layer of the plant they feed on and, in addition, must remain in the soil long enough to kill the roots. It follows that the effectiveness of soil sterilizers depends on their ability to be rinsed, the type of plants, the type of soil, and climatic conditions [14-15].

A method of destroying weeds in industrial areas. The invention relates to the transport, pipeline and energy industries, and can be used in the destruction of unwanted vegetation on nonagricultural lands, for example, in the separation of railways and highways. Method of plant destruction-before processing, antifreeze, such as ethylene glycol, is introduced into the composition of the working fluid containing the herbicide Ankor-85. The amount of antifreeze added depends on the temperature of the during processing and varies between 3-15% of the working fluid. The technical result is an increase in the effectiveness of herbicides, and at the same time, doubling the duration of effective weed treatment with herbicides. The proposed invention relates to the transport, pipeline and energy industries, can be used in the destruction of unwanted vegetation on lands not used in agriculture, for example, in the right-of-way of railways and highways, in protection zones of overhead lines [16-17].

Weeds cause many problems during the operation of industrial areas, for example, on a railway strip, weeds clog road junctions, worsen the drainage capacity of ballast, and create a fire hazard. Various methods are used to destroy weeds, namely burning with special equipment, irradiation. This method allows you to destroy both weeds and seed stocks in the upper soil layer. However, the deep soil layers in which the roots and tubers are located remain inaccessible to heat treatment. In addition, the use of this method requires high energy costs.

An inexpensive and effective way to destroy weeds in industrial areas is to treat them with continuous soil herbicides. This method is perceived as a prototype. According to this method, industrial territory area is treated with a working fluid containing the herbicide Ankor-85, made on the basis of sulfometuron-methyl. When the working fluid is applied to the surface of the plant and soil, the herbicide is absorbed by the plants, leading to the death of the treated plants. Under the influence of the herbicide through the plant absorption system, the root system of weeds also dies, which ensures reliable cleaning of the treated area from weeds for a long time [18-19].

### **Materials and Methods.**

In the summer, residents and gardeners use popular methods of weed control. Many are afraid to use chemicals on their crops and often use products that are readily available: salt, acetic acid, washing liquid, laundry soap, diesel fuel. Chemical methods of control are ineffective only in rare cases. In most cases, any chemicals in high-concentration solutions destroy plant tissue, if positive results can be achieved by using solutions of special and cheap drugs, there is no need to use expensive concentrated solutions. Therefore, current scientific research is aimed at testing the effectiveness of various chemical solutions in small experimental

plots planted with weeds. Since the economic effectiveness of the use of various chemical solutions is based on their ability to provide long-term cessation of plant growth, observations in experimental plots are carried out for several years before the achieved result is finally determined.

In order to eliminate the camel population, the first experimental work facility was selected. Railway and road edges and footpaths were selected as objects. Model test works were selected from 1 square meter, where the slope growth was estimated to be 6-9 roots. Chemical compositions were prepared in laboratory conditions for weed control.

In the chemical composition, acetic acid - 25, 50, 75, 99% concentration, table salt, washing liquid, laundry soap, diesel fuel and concentrated solutions of sulfuric acid were taken as the main components.

The method of cleaning weeds with acetic acid and salt - with the help of acetic acid and salt, you can eliminate weeds in a private plot. It is important to keep the proportions of things for the right effect. Everything is mixed and sprinkled on weeds. You can see the result after a day. It is necessary to work carefully, because cultivated plants may die from it. During spraying, cultural plantings should be covered with a film. This tool washes nutrients from the soil, so it should be used mainly on driveways and roadsides [20].

### Results and Discussion.

We monitored the samples every three days after pouring. In the first 10 days, yellowing and wilting of the weed was observed. We repeated the experiment every 10 days. Duration of experience is 60 days.



Figure 1 - Weed removal by chemical means

You can use a salt solution to kill weeds. But this method is mostly used on roads and roadsides. Because this method can damage the garden. Salt enters the soil solution and inhibits the growth of not only weeds, but also cultivated plants. Also, the chlorine contained in table salt has a toxic effect on the microorganisms of worms living in the soil. A concentrated solution falling on the leaves burns them, which leads to the death of the plant [21].

It is recommended to use kerosene from weeds in home gardens. However, the effects of diesel fuel spraying on the surrounding vegetation were observed. But this product is very poisonous, all plants die from it. If the soil is watered with kerosene, nothing will grow for two years. Many vegetable growers use kerosene treatment for weeds that grow far away. Boiling water is poured completely into the grass and watched.

Eradication of *A. Pseudalhagia*, a perennial plant from the legume family, found in saline soils, using a new composition of herbicides. The average number of weeds in 1m<sup>2</sup> is 6-9 pieces. Solutions of acetic acid in different proportions were mixed to eliminate harmful grasses on road junctions.



Figure 2 - Weeding with diesel fuel

Table 1 below shows the details of the experimental work on the destruction of plants using chemical additives.

Table 1 - Destruction of A. Pseudalhagi plant by chemical means

Sample	Components	Amount	Number of weeds before treatment. (1m <sup>2</sup> )	Number of weeds after treatment. (1m <sup>2</sup> )
Sample 1	Acetic acid (25%)	100 ml	6	4
	Salt	50 ml		
	Washing liquid	10 ml		
	Distilled water	300 ml		
Sample 2	Acetic acid (50%)	100 ml	8	5
	Salt	50 ml		
	Washing liquid	10 ml		
	Distilled water	300 ml		
Sample 3	Acetic acid (75%)	100 ml	7	5
	Salt	50 ml		
	Washing liquid	10 ml		
	Distilled water	300 ml		
Sample 4	Acetic acid (99%)	100 ml	8	5
	Salt	50 ml		
	Washing liquid	10 ml		
	Distilled water	300 ml		
Sample 5	Acetic acid (25%)	100 ml	6	5
	Salt	50 ml		
	laundry soap	10 ml		
	Distilled water	300 ml		
Sample 6	Acetic acid (50%)	100 ml	9	7
	Salt	50 ml		
	laundry soap	10 ml		
	Distilled water	300 ml		
Sample 7	Acetic acid (75%)	100 ml	8	6
	Salt	50 ml		
	laundry soap	10 ml		
	Distilled water	300 ml		

Sample 8	Acetic acid (99%)	400 ml	7	1
Sample 9	Diesel fuel	400 ml	7	5
Sample 10	Diesel fuel	200ml	6	4
	Acetic acid (99%)	200ml		
Sample 11	Diesel fuel	100 ml	9	6
	Acetic acid (99%)	200 ml		
	Salt	50 ml		
	laundry soap	10 ml		

Before pouring the prepared sample, we cleaned the experimental facility. We dug around each base of wormwood in the specified square meter and first poured water so that it reached the roots. The herbicidal composition made with distilled water is suitable for absorption by the roots of the weed.

The home solution should be used carefully in order not to harm cultural plantings. The main rule: if it is necessary to remove grass from the ridges, then it is better to use a solution of acetic acid. To do this, you need to take a weak concentration of acetic acid and dilute it to half with water.

### Conclusion.

As a result of the conducted experiments, the effectiveness of 11 chemical samples for the destruction of the slope was tested. Only 60-65% of weeds per square meter were destroyed in samples No.1 - 4 where vinegar was used. And because the solution made with Acetic acid 75% salt and laundry soap samples No.5-7 destroys weeds more, sample sample No.7 was chosen as the most effective indicator 80% of the weeds were destroyed. Wedge sample No.8 was ineffective because it was 99% pure Acetic acid and had a bad smell and was more harmful to other plants nearby. In samples No.9-11, only 66-68% was removed due to mixing with diesel oil. Ecologically, by using waste, it eliminates weeds, does not harm the environment and human health. It was more environmentally friendly to add other components to make the samples prepared with Acetic acid more effective.

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## АВТОЖОЛ ТОРАПТАРЫНДАҒЫ ТҮЙЕЖАНТАҚ А.PSEUDALHAGI АРАМШӨБІН ХИМИЯЛЫҚ ЖОЛМЕН ЖОЮ

**Андатпа.** Ауыл шаруашылығына арналған жерлерден тыс аймақтарда қажетсіз өсімдіктерді жою, мысалы, автокөлік және темір жолдарының жиектері, жаяу жүргіншілер жолы маңызды мәселелердің бірі. Темір жол мен автокөлік саласында тасымалдау үдерісінің қауіпсіздігі мен үздіксіз жұмысын қамтамасыздандыру өндірістік инфрақұрылымдарды өсімдіктерден қорғау тәсілдерінің тиімділігіне байланысты. Қазіргі кезде арамшөптермен күресу үшін химиялық құрамды әртүрлі гербицидтер қолданылады. Өкінішке орай, осы уақытқа дейін алуан түрдегі өсімдіктерді толығымен жоюға арналған гербицидтер табылған емес. Сонымен қатар тиімділігі жоғары гербицидтер кездескенімен, олардың улылығының жоғары дәрежеде болғаны жануарлар әлемінің өкілдеріне зиянын келтіруде.

Жол бойындағы шөптің өсуі тиісті орындалатын жұмыстардың сапасы мен қауіпсіздігіне әсер етумен қатар эстетикалық қабылдауды нашарлатады және жасылданып тұрған өсімдіктерге малдар үйір болады. Осыдан төтенше жағдайлар туындап, жануарлар тіршілігіне қауіп төндіріледі.

Гербицидтердің әсерлері белгілі бір дәрежеде өсімдіктердің түрлеріне ғана емес, табиғи-климаттық жағдайларға, топырақтың құнарлылық дәрежесіне де байланысты. Құрғақ климаты бар аймақтарда, мысалы, Қазақстанның оңтүстігінде, ылғалдың жетіспеуінен тамыры жер қыртысына тереңдеп жайылып кететін өсімдіктерді жою белгілі бір қиындық туындырады. Бұл зерттеу жұмысында химиялық қоспалармен арамшөптерді жоюға болатындығы, тәжірибелік жұмыстар нәтижесінде анықталған.

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## ХИМИЧЕСКОЕ УНИЧТОЖЕНИЕ ВЕРБЛЮЖЕЙ КОЛЮЧКИ А.PSEUDALHAGI НА АВТОДОРОЖНЫХ ПУТЯХ

**Аннотация.** Удаление с обочин автомобильных, железных и пешеходных дорог, т.е. из мест несельскохозяйственного назначения, является одним из важнейших проблем. Обеспечение безопасности и непрерывности транспортного процесса в железнодорожном и автомобильном хозяйстве зависит от эффективности методов защиты инфраструктур промышленных предприятий.

В настоящее время для борьбы с сорняками применяют различные химические гербициды. К сожалению, до сих пор не найдены гербициды, способные полностью уничтожить все виды растений. Известные гербициды с высокой эффективностью обладают повышенным уровнем токсичности, нанося вред окружающей среде.

Наряду с ухудшением эстетического восприятия рост трав на полотне дорог влияет не только на качество и безопасность выполняемых технических работ, но и является



приманкой для домашнего скота. На зеленую массу растительности стекается домашний скот, что создает аварийные ситуации и ставит под угрозу жизнь животных.

Действие гербицидов в определенной степени зависит не только от видов растений, но и от природно-климатических условий и степени плодородия почвы. В регионах с засушливым климатом, например на юге Казахстана, трудно уничтожить растения, корни которых проникают глубоко в земную кору из-за недостатка влаги. В данной исследовательской работе в результате экспериментальных работ установлена возможность уничтожения проблемных сорняков химическими смесями.

**Ключевые слова.** автомагистраль, сорняки, химические пестициды, гербициды, A. Pseudalhagi.

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