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# STUDY AND DETERMINATION OF DISEASES AND PESTS OF REPAIR RASPBERRY «BRYANSKOE DIVO» IN THE SOUTH-EAST OF KAZAKHSTAN

**Abstract.** The intensity of diseases and pests was determined in LLP "Kazakh Research Institute of Plant Protection and Quarantine named after Zhazken Zhiembayev" in the test center of phytosanitary laboratory analysis for phytopathological and entomological examination.

As a result of the analysis of entomological examination on the leaves of raspberries were found pests of the plant. No pests or nematodes were found in soil samples.

On the basis of the symptoms of the disease and phytopathological analyses, it was found that the presented samples of raspberries are parasitic with purple spot, the causative agent of *Didymella applanala*, as well as secondarily inhabited by fungi of the genera *Fuzarium, Aspergillius, Alternaria, Penicillium, Mucor*.

Classical phytopathological methods were used for the phytopathological diagnosis of raspberry disease. Determination of fungal and bacterial microflora was carried out on morphological and cultural characteristics of the colony of fungi and bacteria isolated in pure culture.

**Key words:** repair raspberry, pathogen, disease, fungus, phytopathology, entomology.

**Introduction.** Over the past three years, about 300 hectares of plantations have already been laid in Almaty region, and only with remontant varieties. These varieties are technologically easier to grow than traditional ones, due to the fact that they bear fruit on annual shoots and do not require protective measures against winter damage and the installation of an expensive trellis.

Repair raspberries - a group of varieties of raspberries, characterized by the ability to bear fruit on both biennial and annual shoots [1].

Due to the fact that raspberry repair is very weakly damaged by diseases and pests, its other advantages are manifested. First, it does not need various chemical treatments and associated with this operation costs and time. And, secondly, as a consequence of the lack of treatments with chemicals dangerous to health, an environmentally friendly crop ripens on raspberries. Such berries have a special healing power, they can be used without fear for both children and people suffering from various diseases [1].

Purposeful selection of remontant raspberries in Russia is carried out a little more than four decades. The leading institution implementing this program in Russia is Kokinsky stronghold (Bryansk region) of the all-Russian selection and technological Institute of horticulture and nursery. Professor I. V. Kazakov made a special contribution to the creation of Russian varieties of repair raspberries [2].

Bryanskoe divo – a variety of raspberries which is characterized by long fruiting and high yield. Reaches a height of 1.5 - 2 meters. The flexible shoots of the Bush are covered with brown bark. They are densely arranged small spines [3].

**Materials and methods of research.** The intensity of diseases and pests was determined in LLP "Kazakh Research Institute of Plant Protection and Quarantine named after Zhazken Zhiembayev" test center of phytosanitary laboratory analysis for phytopathological and entomological examination.

For the analysis we took different morphological indicators formed raspberry bushes from different experimental sites. Morphological, anatomical species of the plant shows a change in the shoot and in the leaves.

For examination, the samples were provided raspberry variety "Bryanskoe divo" in the test center of phytosanitary laboratory analysis LLP "Kazakh Research Institute of Plant Protection and Quarantine named after Zh. Zhiembayev".

The intensity of diseases and pest analysis took samples of the whole stalk, leaves and fruit, the soil under the plant variety of raspberry "Bryanskoe divo" 4 replications I and plot II plot III plot IV - plot.

Entomological examination tests were carried out by visual methods under a binocular microscope and soil washing methods.

Stalk examined its surface with a magnifying glass. Inspection began with the root system. The remains of the soil are cleaned with a scalpel in a Petri dish, we look through binoculars for the presence of insects and mites, the affected area was hidden and removed pests.

Soil washing is carried out to separate contaminated fractions and pollutants.

Classical phytopathological methods were used to diagnose the phytopathological disease of raspberries.

The object of General Phytopathology is:

- pathogens, causes and conditions of their occurrence;
- general anatomical and physiological changes in diseased organisms;
- plant immunity and quarantine; – means and methods of plant protection [4].

The fungus Ascochyta soaeicola affects all organs of the plant: cotyledons, leaves, stems, beans and seeds. In Primorsky Krai this fungus is the causative agent of soybean root rot [5].

The fungus is distributed in a number of Western European countries, in Japan, China, Georgia, Ukraine, Moldova. We have found in the far East, Central regions, the North Caucasus, Krasnodar region [6].

*Didymella applanala* (or purple spotting) is the most common and quite dangerous disease of raspberries. This disease weakens the plant, making it vulnerable to pathogenic microflora and insect pests [7].

*Fuzarium* – in nature, it is represented by an extensive biologically heterogeneous group of fungi. These include parasites, semi-parasites and saprophytes of plants. There are species that parasitize insects, causing toxicosis and mycosis of warm-blooded animals and humans. Most of the species phototrophy [8]. Plant diseases caused by fungi of this genus are called fusarioses [9].

*Aspergillius* – a genus of higher aerobic fungi comprising several hundred species distributed worldwide in various climates [10].

For the first time, the results of studies of mass reproduction of aphids (Schizaphis graminum) using an improved version of the above-ground plant were obtained [11].

**Results and discussion.** Entomological examination tests were conducted by visual methods under the binocular Nexius Zoom NZ.1903-S and methods of soil washing.

Principle of operation. Soil washing is an external process in which contaminated soil is extracted and subjected to a process involving the use of water. It works on the principle that contaminants are associated with fractions of a certain size and these contaminants can be dissolved and suspended in an aqueous solution, or removed by separating clay and silt particles from the soil volume.

As a result of the analysis, eggs and imagos of ticks, lozhnoshitovki, nymphs of thrips, pupari of whiteflies, and beetles-weevils were found on raspberry leaves (figures 1,2,3). No pests or nematodes were found in the soil.

Figure 1 – Raspberry leaves "Bryanskoe divo" nymphs trips council

Figure 2 – False Whiting in raspberry samples

Figure 3 – Imago weevil's

Symptoms: on the submitted samples of raspberries affected roots, stems and leaves (figure 4). Leaves, browned along the veins, marginal necrosis.

Figure 4 –
Symptoms of the disease
on raspberries "Bryanskoe divo»

The berries shrivelled. On the stem was ringed with a purple coloration along the stem. On some parts of plants and leaf petioles unilateral purple color (figure 5). Roots poorly developed, browned, maceration of lateral roots (figure 6).

Figure 5 – Symptoms on stems
and petioles of raspberry

Figure 6 –
Symptoms on the roots of raspberry

Classical phytopathological methods were used for the phytopathological diagnosis of raspberry disease. Determination of fungal and bacterial microflora was carried out by morphological and cultural characteristics of the colony of fungi and bacteria isolated in pure culture. Raspberry branches on the nutrient medium potato agar (KA) and in a wet chamber, when cultivated in a thermostat at 25-26C for 5-7 days.

Morphological characteristics of the fungi was assessed by microcapillary for sporulation. Bacterial microflora was isolated in pure culture and tested for pathogenicity on potato tubers. Pathogenic species of bacteria cause potato tubers maceration (rotting) tissue.

The results of phytopathological analysis showed that raspberry plants are infected with fungal and bacterial microflora (figure 7,8 and 9,10).

Figure 7 – Bacterial and fungal microflora
on raspberry branches (nutrient medium)

Figure 8 – Fungal and bacterial microflora
on raspberry leaf petioles (nutrient medium)

Figure 9 – Bacterial microflora on raspberry horses (nutrient medium)

Figure 10 – Bacteria Isolated in pure culture from the root

As a result of bacteriological analysis, bacteria were isolated into a pure culture. This is dominated by fungi of the genus *Didymella applanala* and *Fuzarium* sp., fungi from the genera *Aspergillius sp, Alternaria, Penicillium sp, Mucor* have also been found (figure 11 – 16). Their pathogenic properties were tested on test objects-potato tubers.

Figure 11 – Mycelium of the fungus *Didymella applanala*

Figure 12 – Conditii mushroom *Fuzarium sp*

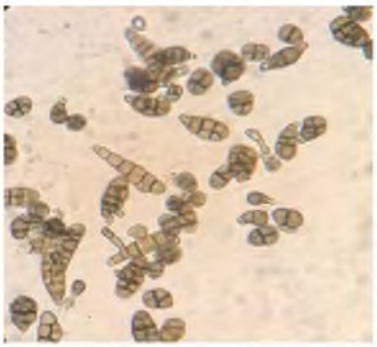

Figure 13 – Condidia of the fungus *Alternaria*

Figure 14 – Condidia of the fungus *Penicillium sp*

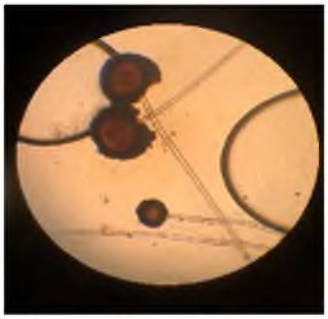

Figure 15 – Condenser with candidiasi fungus Aspergillius sp

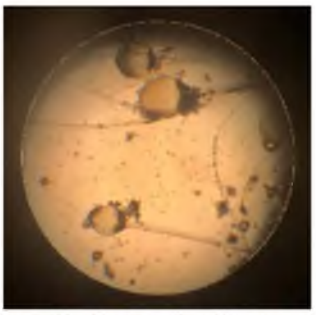

Figure 16 – Sporangia with spores of *Mucor SP fungus*

Figure 17 –
Testing of pathogenic properties
of bacteria isolated in pure culture
on potato tubers-maceration (rot)
of potato tuber

Bacteria a day later caused wet rot on potato tubers (figure 17). Maceration (decay) of potato tuber tissue (bacteria isolated from raspberry roots). According to morphological and cultural characteristics, as well as pathogenic properties, the isolated bacteria were identified as *Pectobacterium carotovorum*, the causative agent of soft rot.

**Conclusion.**

1. As a result of the analysis of entomological examination on the leaves of raspberries, pests of plants, nymphs of thrips, pupari whiteflies, and beetles-weevils were found. No pests or nematodes were found in the soil.

2. On the basis of the symptoms of the disease and phytopathological analyses, it was found that the presented samples of raspberries are parasitic with purple spot, the pathogen *Didymella applanala*, and secondarily inhabited by fungi of the genera *Fuzarium, Aspergillius, Alternaria, Penicillium, Mucor*.

3. The root system is affected by root rot-the causative agent of the bacterium *Pectobacteriom carolovorum*, the causative agent of soft rot.

**Recommendation**. Carry out pruning of the affected parts of plants, destroy them by burning; destruction of weeds; autumn deep digging; application of phosphorus-potassium fertilizers; destruction of young shoots to reduce thickening. Post-harvest spraying with copper-containing fungicides – Corset, Cosid, Jordan systemic fungicide Soon – 0,5 (50 g per 10 liters). Treatment repeat early spring until bud pushing conduct, watering under roots drugs Kuramin Foliar, consumption 25 ml on 10 l are unaware water and Fosgraf MKP (fertilizer), consumption 25 ml on 10l water. Through 5 days' conduct spraying stimulants Aminopul (10 gr on 10I are unaware), Fitop (1ml on 10l) or Ekstrasolom 0.2%. Consumption 20 ml on 10l.

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## ҚАЗАҚСТАННЫҢ ОҢТҮСТІК-ШЫҒЫСЫНДА «БРЯНСКОЕ ДИВО» РЕМОНТАНТТЫ ТАҢҚҰРАЙ СОРТЫНЫҢ ЗИЯНКЕСТЕР МЕН АУРУЛАРЫН ЗЕРТТЕУ

**Аннотация.** «Ж. Жиенбаев атындағы Қазақ өсімдікті қорғау және карантин гылыми-зерттеу институты» ЖШС-де фитопатологиялық және энтомологиялық сараптамалар фитосанитарлық зертханалық талдау және сынақ орталығында аурулар мен зиянкестермен зақымдану қарқындылығын анықталды.

Таңқурай сортын талдау үшін әртүрлі тәжірибелік учаскелерден құрылған таңқурай өркенінің морфологиялық көрсеткіштер бойынша алынды. Өсімдіктің әр түрлері өркендері мен жапырақтарының морфологиялық, анатомиялық құрылысында өзгерістер байқалды.

Брянское диво таңқурай сортының аурулар мен зиянкестер зақымдану қарқындылығын талдау үшін, V-қайталымнан тұратын: I-ші бөлігі, II-ші бөлігі, III-ші бөлігі, IV-ші бөліктерінен сабақтар мен жемістері, өркен астындағы топырағынан алынды.

Энтомологиялық сынақ сараптамасы бинокулярлық микроскоппен визуалды және топырақты жуу әдістерімен жүргізілді. Лупаның көмегімен сабақтың беткі бөлігін бақылап қаралды. Тексеріп, талдай жұмыстары тамыр жүйесінен басталды. Топырақ қалдықтарын Петри тостағанына скальпельдің көмегімен тазартылды, жәндіктер мен кенелердің бар жоғын бинокуляр аппаратымен қарап анықтадық.

NexiusZoom NZ 1903-S маркалы бинокулярлық микроскоппен энтомологиялық сараптама сынағы визуалды әдістермен және топырақты жуу әдістерімен жүргізілді.

Таңқурай жапырақтарына талдау нәтижесінде кенелердің жұмыртқасы, имаго, трипстердің нимфалары, аққөбелек пупари зиянкестері табылған. Топырақта зиянкестер мен нематодтар табылған жоқ.

Зерттеулер нәтижесінде таңқурай жапырақтарында энтомологиялық сараптама нәтижесінде өсімдік зиянкестері анықталды. Топырақ үлгілерінен зиянкестер мен нематодтар табылған жоқ.

Аурудың пайда болу белгілері мен фитопатологиялық талдаулар негізінде таңқурайдың ұсынылған үлгілерінен пурпурпурлы дақтылықпен зақымданған, *Didymella applanala* қоздырғышы, сондай-ақ екінші деңгейдегі саңырауқұлақтармен залалданған *Fuzarium, Aspergillius*, , *Alternaria, Penicillium, Mucor* зақымданғаны анықталды.

Фитопатологиялық зерттеуде таңқурай ауруын анықтау үшін классикалық фитопатологиялық әдістер қолданылды.

Саңырауқұлақ және бактериялық микрофлораны анықтау үшін таза дақылға бөлінген саңырауқұлақтар мен бактериялар колониясының морфологиялық және мәдени белгілері бойынша жүргізілді.

Таңқурай ауруының фитопатологиялық диагностикасын анықтау мақсатында классикалық фитопатологиялық әдістер қолданылды. Саңырауқұлақ және бактериялық микрофлораны анықтау таза дақылға бөлінген саңырауқұлақтар мен бактериялар колониясының морфологиялық және мәдени белгілері бойынша жүргізілді. Құнарлы ортада картоп агарында (КА) және ылғалды камерада таңқурай бұтақтарында, термостатта 25-26С 5-7 күн бойы өсіру кезінде бақылау жүргізілді..

Жүргізілген талдаудан кейін таңқурай зиянкестер және ауруларымен күресу шаралары анықталды:

a) өсімдіктердің зақымданған бөліктерін кесу;
b) оларды өртеу арқылы жою;
c) арамшөптерді жою;
d) күзгі терең қазу;
e) фосфор-калий тыңайтқыштарын енгізу;
f) түптің қалыңдығын төмендету үшін жас өскіндерді жою.

**Түйін сөздер:** ремонтантты таңқурай, қоздырғыш, ауру, зиянкестер, саңырауқұлақ, фитопатология, энтомология.

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## ИЗУЧЕНИЕ И ОПРЕДЕЛЕНИЕ БОЛЕЗНЕЙ И ВРЕДИТЕЛЕЙ РЕМОНТАНТНОЙ МАЛИНЫ «БРЯНСКОЕ ДИВО» НА ЮГО-ВОСТОКЕ КАЗАХСТАНА

**Аннотация.** Интенсивность поражения болезнями и вредителями определяли в ТОО «Казахский научно-исследовательский институт защиты и карантина растений имени Жазкена Жиембаева» в испытательном центре фитосанитарного лабораторного анализа по фитопатологической и энтомологической экспертизе.

Для анализа взяли разные по морфологическим показателям сформированные кусты малины из разных опытных участков. По морфологическим, анатомическим видам растение видно изменение в побеге и в листьях.

В результате анализа энтомологической экспертизы на листьях малины были обнаружены вредители растений. В образцах почвы вредителей и нематоды не обнаружено.

Интенсивность поражения болезнями и вредителями на анализ взяли образцы весь стебель, листы с плодами, почвы под растением, сорт малины «Брянское диво» 4-х повторности I-делянка, II-делянка, III-делянка, IV- делянка.

На основании энтомологической экспертизы испытания проводились визуальным методом под бинокулярным микроскопом и методом промывки почвы.

Поверхность стебля осматривали с помощью лупы. Осмотр начали с корневой системы. Остатки почвы очищали скальпелем в чашку Петри, просматривали бинокуляром на наличие насекомых и клещей, вскрывали и извлекали вредителей, обнаруженные на поражённом участке.

Энтомологические экспертизы испытания проводились визуальным методом под бинокулярным микроскопом NexiusZoom NZ.I903-S и методом промывки почвы.

В результате анализа на листьях малины обнаружены яйца и имаго клещей, ложношитовки, нимфы трипсов, пупари белокрылок, а также жуко-долгоносиков. В почве вредители и нематоды не обнаружены.

На основании симптомов проявления болезни и фитопатологических анализов установлено, что представленные образцы малины поражены пурпурной пятнистостью, возбудитель *Didymella applanala*, а также вторично заселены грибами родов *Fuzarium, Aspergillius, Alternaria, Penicillium, Mucor*.

В фитопатологической диагностике заболевания малины использовались классические фитопатологические методы. Определение грибной и бактериальной микрофлоры проводили по морфологическим и культурным признакам колонии грибов и бактерий, выделенных в чистую культуру.

Для фитопатологической диагностики заболевания малины использовались классические фитопатологические методы. Определение грибной и бактериальной микрофлоры проводили по морфологическим и культурным признакам колонии грибов и бактерий, выделенных в чистую культуру, на ветках малины, в питательной среде, картофельном агаре (КА) и во влажной камере, при культивировании в термостате при 25-26С в течение 5-7 дней.

После проведенного анализа были установлены меры борьбы с вредителями и болезнями малины:

1. Проведение обрезки пораженных частей растений;
2. Уничтожение их путем сжигания;
3. Уничтожение сорняков;
4. Осенние глубокие перекопки;
5. Внесение фосфорно-калийных удобрений;
6. Уничтожение молодых порослей для снижения загущенности.

**Ключевые слова:** ремонтантная малина, возбудитель, болезнь, грибок, вредитель, фитопатология, энтомология.

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## REFERENCES

[1] Kazakov, I. V., Sidel'nikov, A. I., Stepanov, V. V. Remontantnaya malina v Rossii. Chelyabinsk: Sad i Ogorod, 2007. 144 p. (in Russ.).

[2] Kazakov I., Yevdokimenko S.N. Remontantnaya malina // Nauka i zhizn': zhurnal. 2007. N 9 (in Russ.).

[3] Sort malina. Bryanskoye divo - sort-malina.ru/malina-bryanskoe-divo/ (in Russ.).

[4] Fitopatologiya - https://ru.wikipedia.org/wiki/ (in Russ.).

[5] Zaostrovnykh V.I. Bolezni soi // Zashchita i karantin rasteniy. M.: 2005. N 2. P. 49-53 (in Russ.).

[6] Naumova Ye.S., Uspenskaya G.D. Vnutrividovoye raznoobraziye griba Ascochyta sojaecola Abramov ex Nelen // Mikologiya i fitopatologiya. Leningrad. "Nauka". 1989. t. 23. Vol. 6. P. 533-53 (in Russ.).

[7] Kak lechit' Didymellu [Elektronnyy resurs]. URL: https://ufermer.com/sad/malina/kak-lechit-didimellu.html

[8] Takhtadzhyan A.L. (gl. red.) i dr. Mir rasteniy. Tom 2. Griby Moskva.: Prosveshcheniye, 1991. 475 p. (in Russ.).

[9] Vakin A.T., Golovin P.N. i dr. Slovar'-spravochnik fitopatologa. Leningrad Izdatel'stvo.: Sel'khozgiz, 1959. 414 p. (in Russ.).

[10] *Geiser D. M.* Sexual structures in Aspergillus: morphology, importance and genomics. (англ.) // Medical mycology. 2009. Vol. 47. Suppl 1. P. 21-26. -DOI:10.1080/13693780802139859

[11] Duisembekov B. A., Chadinova A. M., Alpysbayeva K. A. Optimization of the technology of mass breeding of cereal aphids (Schizaphis graminum) using an aeroponic cultivation and the breeding of the Aphidius bioagent (Aphidius matricariae) News of the national academy of sciences of the republic of kazakhstan series of agricultural sciences ISSN 2224-526X Vol. 6, N 48 (2018), 74–80 https://doi.org/10.32014/2018. 2224-526X.22