

**BIOLOGICAL OBJECTIVATION OF MEASURES OF PEA
PROTECTION FROM DOWNY MILDEW**

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Abstract. *Protection of peas from disease is of particular importance in the system its productivity increase. The use of chemicals for plant protection yields positive results, but causes a negative impact on product quality and the environment. Studying bio-fungicide of new generation Mikosan-N shows high efficacy against the most common pathogens of the most common diseases of peas.*

Key words: *plant protection, plant resistance, downy mildew, biologies, disinfectants, infected plants, disease progression, pea productivity*

International UN summit on the environment (Rio de Janeiro, 1992) adopted a resolution regarding Article 21, which is a long-term program of development of the world community in XXI century. It states that due to population growth plant protection is an extremely important component of stabilization. Attention is focused on the importance of improving the integrated plant protection and the development of environmentally friendly non-chemical methods. Undoubtedly, the solution of this problem is possible by giving priority to agro-technical, immunological and biological methods and substantial improving of the chemical method [1].

In recent years one of the promising areas of chemical plant protection method environmentalization that have been reported is the establishment and introduction into production of immune inductors – preparations based on compounds with the ability to increase plant resistance against herbivores and pathogens. The main positive feature of these compounds is not a biocide, but bio-regulatory performance. In addition, they are safe for humans and animals, have

certain selectivity, are used in minimum application rates and provided with low-tonnage production [2].

One of the important factors reducing the development of downy mildew of peas is pretreatment of seeds with chemicals and biologics.

Years of international experience shows that the intensive use of chemicals for plant protection, really allows in many cases to reduce the losses of agricultural products from disease and pests, but success in this is almost always accompanied by negative side effects and processes that cause imbalance in the ecosystem[3].

The aim of research is studying biological efficacy of preparations, which include glucan-melanin complex and chitosan for protecting peas from diseases.

Research Methodology. The research was conducted during 2008-2010 in RS “Chabany”, Kiev region.

The soil is dark gray degraded, coarse silt, light loam with 1.87- 2.01% of humus, 7.7- 8.9 mg/ 100 g of alkaline hydrolyzed nitrogen, 15.8- 19.5 of labile phosphorus, 13.8- 17.0 mg / 100g of exchangeable potassium, 5.9- 6.3 of pH_{sol}. It has been provided preventive limitation of pathogenic microorganisms using chemicals and biologics[4].

Results. In terms of the Kiev region, treatment of pea seeds of Nord variety with Mikosan-N (7 l/t) together with EPAA polysaccharide (0.2 l/t) when compared to control contributed to increase of seed vigor by 23.4%, field germination – by 7.1%, stand density of plants – 17 pcs / m² (Table 1).

Thus, treatment of pea seeds with Fundazol 50%, when compared to the control contributed to reducing the number of plants affected with downy mildew by 18%, and disease progression – by 16.4% (flowering stage). In phase of bean filling the amount of affected plants decreased by 55.2% and disease progression – by 19% respectively. During seed treatment only with biology Mikosan-N (7 l/t) plant infestation was slightly higher – by 0.2-0.8% (flowering stage) and 1.2-2.8% (phase of bean filling) (Table 2).

1. Effect of disinfectants on-biometric indicators of pea plants

(Nord variety, RS “Chabany”, Kyiv region, 2008-2010)

| Variant | Preparation consumption rate, l, kg / t | Seed vigor, % | Field germination, % | Seedling density, pc./m ² | Plant height, cm |
|--|---|---------------|----------------------|--------------------------------------|------------------|
| Control –no treatment | - | 50.6 | 82.1 | 103 | 15.5 |
| Fundazol 50% w.p.+Mars | 2+0.2 | 58.4 | 85.8 | 110 | 18.5 |
| Mikosan- N, 13,0% w.s.c.+polysaccharide (EPAA) | 7+0.2 | 74.0 | 89.2 | 120 | 19.5 |
| Mikosan— N, 13.0% w.s.c. | 7 | 68.2 | 88.0 | 114 | 18.9 |
| Polysaccharide (EPAA) | 0.2 | 72.4 | 86.4 | 112 | 18.0 |
| NIR ₀₅ | | 1,4 | 2,0 | 1,5 | 0,9 |

2. Effect of treatment Nord variety pea seeds with chemicals and biologies on the development of downy mildew (Nord variety, RS “Chabany” Kyiv region, 2008-2010)

| Variant | Flowering | | Bean filling | |
|--|--------------------|-----------------------|--------------------|-----------------------|
| | Affected plants, % | Disease progression,% | Affected plants, % | Disease progression,% |
| Control – no treatment | 62.0 | 25.0 | 85.2 | 19.6 |
| Fundazol 50% w.p. 2 l/t | 44.0 | 8.6 | 30.0 | 6.0 |
| Fundazol 50% w.p. 2 l/t +Mars 200 ml/t | 40.0 | 8.0 | 20.0 | 4.0 |
| Mikosan-N, 13.0% w.s.c. 7 л/т + polysaccharide 0,2 l/t | 30.0 | 6.2 | 16.0 | 4.7 |
| Mikosan-N,13,0% w.s.c.7 l/t | 35.0 | 7.6 | 22.3 | 5.2 |
| Polysaccharide (EPAA) 0.2 l/t | 42.0 | 10.0 | 36.4 | 8.6 |
| NIR ₀₅ | 1,7 | 0,8 | 1,5 | 1,1 |

Treatment of pea seeds before sowing with biologies helped to increase plant productivity (Table 3). Thus, in terms of the Kiev region, the best results were

obtained when pea seeds were treated with bio-fungicide Mikosan – N (7 l/t) together with polysaccharide (EPAA) – 0.2 l / t.

In this variant, when compared to control, plants had a greater height 8.8 cm, the number of beans per plant – more by 2.4 pc., the number of grains per plant – by 5.3 pc., grain mass per plant was higher by 0.16 g, mass of 1000 grains was by 20.6 g higher respectively, and the yield – by 7.5 t / ha (Table 3).

3. Effect of treatment Nord variety pea seeds with chemicals and biologies on plant productivity (Kyiv region, RS “Chabany”, 2008-2010)

| Variant | Plant length, cm | Beans per plant, t. | Grains per plant, t. | Grain mass per plant, g. | Mass of 1000 grains, g. | Yield, t/ha |
|--|------------------|---------------------|----------------------|--------------------------|-------------------------|-------------|
| Control – no treatment | 61.8 | 3.1 | 11.6 | 0.250 | 216.7 | 2.26 |
| Fundazol, 50% s.p. 2 l/t | 64.5 | 4.9 | 16.1 | 0.340 | 227.3 | 2.53 |
| Fundazol 50% s.p. 2 l/t + mars 200 ml/t | 66.9 | 5.3 | 15.0 | 0.360 | 219.8 | 2.42 |
| Mikosan-N, 13.0% w.s.c. 7 l/t + polysaccharide 0.2 l/t | 70.6 | 5.5 | 16.9 | 0.410 | 237.3 | 2.95 |
| Mikosan – N, 13.0% w. s.c. 7 l/t | 70.5 | 5.4 | 16.5 | 0.380 | 224.5 | 2.81 |
| Polysaccharide 0.2 l/t (EPAA) | 66.0 | 5.0 | 14.4 | 0.365 | 218.0 | 2.36 |
| NIR ₀₅ | 1,3 | 0,6 | 0,9 | 0,04 | 2,6 | 0,09 |

Treatment of pea seeds with polysaccharide EPAA contributed, when compared to control, to increasing the yield of peas by 0.1 t/ha, the mass of 1000 grains was higher when compared to the standard by 1.3 g (Table 3).

Analysis of structural data of pea harvest in terms of Kiev region RS “Chabany” showed that treatment of peas with Mikosan-N, (7 l/t), is significantly inferior to all indices of variants for which it was used the full rate of Mikosan-N (7 l/t) in mixture with polysaccharides (0.2 l/t).

Conclusions

Thus, presowing treatment of pea seeds with bio-fungicide Mikosan-N (7 l/t) and polysaccharide EPPA (0.2 l/t) contributed to reduction, when compared to the control, of the number of plants affected by downy mildew by 30.6% and disease progression – by 8.2% (flowering stage). The weight of 1000 grains was higher by 20.6 g, and yield – by 7.5 t/ha.

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БІОЛОГІЧНЕ ОБГРУНТУВАННЯ ЗАХОДІВ ЗАХИСТУ

ГОРОХУ ВІД ПЕРОНОСПОРОЗУ

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Анотація. Захист гороху від хвороб має особливе значення в системі підвищення його урожайності. Використання для захисту рослин хімічних препаратів дає позитивні результати, але викликає негативний вплив на якість продукції та навколишнє середовище. Вивчення біофунгіциду нового покоління Мікосан-Н показує високу ефективність проти збудників найпоширеніших хвороб гороху.

Ключові слова: захист рослин, стійкість рослин, пероноспороз, біопрепарати, протруйники, уражено рослин, розвиток хвороби, продуктивність гороху

БИОЛОГИЧЕСКОЕ ОБОСНОВАНИЕ МЕРОПРИЯТИЙ ЗАЩИТЫ

ГОРОХА ОТ ПЕРОНОСПОРОЗА

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Аннотация. Защита гороха от болезней имеет особое значение в системе повышения его урожайности. Использование для защиты растений химических препаратов дает положительные результаты, но вызывает негативное влияние на качество продукции и окружающую среду. Изучение биофунгицида нового поколения Микосан-Н показывает высокую эффективность против возбудителей самых распространенных болезней гороха.

Ключевые слова: защита растений, устойчивость растений, пероноспороз, препараты, протравители, поражение растений, развитие болезни, производительность гороха