EOC
EUROASIAN ONLINE CONFERENCES

GERMANY
CONFERENCE

INTERNATIONAL CONFERENCE ON SCIENCE, ENGINEERING AND TECHNOLOGY



Google Scholar zenodo OpenAIRE doi digital object identifier

INTERNATIONAL CONFERENCE ON SCIENCE, ENGINEERING AND TECHNOLOGY: a collection scientific works of the International scientific conference – Gamburg, Germany, 2026 Issue 2

Languages of publication: Uzbek**,** English, Russian, German, Italian, Spanish,

The collection consists of scientific research of scientists, graduate students and students who took part in the International Scientific online conference **« INTERNATIONAL CONFERENCE ON SCIENCE, ENGINEERING AND TECHNOLOGY »**. Which took place in Gamburg, 2026.

Conference proceedings are recommended for scientists and teachers in higher education establishments. They can be used in education, including the process of post - graduate teaching, preparation for obtain bachelors' and masters' degrees. The review of all articles was accomplished by experts, materials are according to authors copyright. The authors are responsible for content, researches results and errors.

FIELD EVALUATION OF THE BIOLOGICAL EFFICACY OF EMABENZO 30% SDG AGAINST COTTON BOLLWORM

Imomaliyev Erali Nurali o‘g‘li
Scientific-Research Institute of Plant Quarantine and Protection, Senior Researcher.
eraliimomaliyev2002@gmail.com
Isroilov Dostonbek Rustam o‘g‘li
Scientific-Research Institute of Plant Quarantine and Protection, Junior Researcher.
dostonbekisroilov2va3@gmail.com

Annotatsiya: This study aimed to evaluate the biological efficacy of Emabenzo 30% SDG insecticide against the cotton bollworm (*Helicoverpa armigera*) in cotton fields. Field trials were conducted using three variants: Emabenzo, a reference product, and an untreated control, arranged in a randomized block design. The insecticide was applied at a critical stage of cotton development using a spraying method. Results demonstrated that Emabenzo exhibited high and consistent efficacy across different larval stages, significantly reducing pest populations without showing any phytotoxic effects. The findings indicate that Emabenzo 30% SDG is an effective tool for controlling cotton bollworm in production conditions.

Kalit so‘zlar: Emabenzo, cotton bollworm, SG formulation, biological efficacy, pest management.

Introduction: In recent years, the incidence and economic impact of insect pests in cotton-growing areas of the republic have increased significantly. The expansion of favorable agroecological conditions has contributed to the intensified development, survival, and spread of major cotton pests. As a result, imbalances within the cotton agrobiocenosis have emerged, leading to population outbreaks of certain pest species. Moreover, insect species that previously caused minor or sporadic damage have become economically important pests, posing a serious threat to cotton productivity and yield stability. Effective management of cotton pests requires an integrated and scientifically based approach. Proper spatial distribution of cotton varieties, the selection of high-yielding and fiber-stable cultivars, and the timely implementation of advanced agronomic practices are essential components of sustainable cotton production. Nevertheless, under conditions of high pest pressure, chemical control remains a critical element of integrated pest management strategies, ensuring rapid and reliable suppression of pest populations. Among modern chemical control options, insecticides with high biological efficacy and favorable application properties are of particular interest. Therefore, the present study was conducted to evaluate the field efficacy of Emabenzo 30% SG (water-soluble granules) against major cotton pests under production conditions, with special emphasis on its potential role in improving chemical pest management programs in cotton cultivation.

Metodologiya: Field experiments were conducted to evaluate the biological efficacy of the insecticide **Emabenzo 30% SG** against the cotton bollworm in cotton fields. The experiment consisted of three treatments arranged according to

the following scheme: treatment 1—Emabenzo 30% SG applied at a rate of 0.07 kg/ha; treatment 2—the reference insecticide Emaben Star 10% SG applied at a rate of 0.2 kg/ha; and treatment 3—an untreated control with no chemical application. (Table 1) The trial was established using a randomized complete block design with three replications. In each experimental plot, pest density and larval developmental stages were recorded before application and at 3, 7, and 14 days after treatment. Biological efficacy was determined using generally accepted evaluation methods and assessed through comparison with the untreated control. All insecticide applications were performed by spraying at the cotton growth stage of 3–4 true leaves under favorable agroclimatic conditions. Based on the obtained data, the efficacy of the tested insecticides against the cotton bollworm, the temporal dynamics of their effectiveness, and their comparative performance relative to the reference treatment were analyzed.

Experimental design.

Table 1

№	**Treatments**	Application rate (L/ha)
1.	Emabenzo 30% s.d.g.	0,07
3.	Emaben Star 10% s.d.g. (Standard)	0,2
4.	Control	Untreated

The experiments were conducted following the existing methodology (Methodical Guidelines, 2004), and the biological efficacy was calculated using Abbott's formula. (Abbot.,1925).

$$C = \frac{Ab - Ba}{Ab} \text{x} 100$$

That is;
C- Biological efficacy %.
A – the number of pests in the experimental plot before insecticide application.
a – the number of pests in the plot after insecticide application.
B – the number of pests in the control plot before insecticide application.
b– the number of pests in the control plot after insecticide application.

Results: On July 4, 2024, field trials of Emabenzo 30% SDG were conducted against the cotton bollworm (Helicoverpa armigera), one of the major pests in cotton. Biological efficacy was assessed at 3, 7, and 14 days after application, and its temporal dynamics were evaluated. The results indicated that the toxicological efficacy of Emabenzo 30% SG was nearly equivalent to that of the reference product, Emaben Star 10% SG. In the reference treatment, biological efficacy on day 3 was 92.6% for larvae aged 1–3 days, 87.0% for larvae aged 4–6 days, and averaged 90.0% overall. On day 7, these values were 93.3%, 83.0%, and 88.0%, respectively, and on day 14, 91.5%, 80.5%, and 87.0%, respectively.

When Emabenzo 30% SDG was applied at a rate of 0.07 kg/ha, its biological efficacy exceeded that of the reference treatment. Specifically, on day 3, efficacy was 95.0% for larvae aged 1–3 days, 91.0% for larvae aged 4–6 days, with an overall average of 93.3%. On day 7, these values were 93.5%, 90.0%, and 92.0%, respectively. On day 14, biological efficacy reached 94.6% for larvae aged 1–3 days, 89.6% for larvae aged 4–6 days, and an overall average of 92.5%. Overall, the field trial results demonstrated that Emabenzo 30% SDG exhibits high and stable biological efficacy against the cotton bollworm. A sharp reduction in pest density was observed in the treated plots, and the efficacy remained consistently high throughout the observation period. Based on these findings, the application rate of 0.07 kg/ha is recommended as optimal for controlling the cotton bollworm under production conditions (Table 2).

Biological efficacy of Emabenzo 30% SG insecticide against cotton bollworm in cotton

Table 2

№	Treatments	Application rate (L/ha)	Average number of pests per 100 plants before application		Average number of pests per 100 plants after application		
					3rd day	7th day	14th day
			egg stage	average	average	average	average
1	Emaben Star 10% s.d.g. (Standard)	0,4	7,6	9,7	1,2	1,6	2,7
2	Emabenzo 30% s.d.g.	0,07	8,2	10,8	0,8	1,2	1,75
3	Untreated	-	8,6	10,3	12,9	14,4	22,2
Biological efficacy (%)							
1	Emaben Star 10% s.d.g. (Standard)	0,4	7,6	9,7	90,0	88,0	87,0
2	Emabenzo 30% s.d.g.	0,07	8,2	10,8	93,3	92,0	92,5
3	Untreated	-	8,6	10,3	-	-	-

Conclusion: The results of the field experiments demonstrated that the insecticide Emabenzo 30% SG has high and stable biological efficacy against the cotton bollworm in cotton. The preparation effectively suppressed different developmental stages of the pest and ensured a significant reduction in pest population throughout the observation period. In comparison with the standard insecticide, Emabenzo 30% SG showed comparable or slightly higher efficacy, while no phytotoxic effects on cotton plants were observed. Based on the obtained results, the application of Emabenzo 30% SG at a rate of 0.07 kg/ha can be recommended as an effective and appropriate dose for the control of cotton bollworm under field conditions.

REFERENCES

1. Alemu, Z., Azerefegne, F., & Terefe, G. Sequential application of various insecticides for the management of cotton bollworm (Helicoverpa armigera) in cotton production. East African Journal of Sciences.
2. Evaluation of the effectiveness of some synthetic insecticides against cotton bollworm, Helicoverpa armigera Hübner. Egyptian Academic Journal of Biological Sciences.
3. Damo, M. M. C., & Solsoloy, A. D. Efficacy of Bacillus thuringiensis chemical insecticide mixtures for bollworm, Helicoverpa armigera control.
4. Srivastava, A., & Chaubey, R. N. Insecticide resistance and management strategies in Helicoverpa armigera. Journal of Economic Entomology (review of resistance cases).
5. Efficacy of biopesticides versus synthetic pesticides in the control of Helicoverpa armigera. Insects.
6. Tabashnik, B. E., & Carrière, Y. Resistance management strategies for insect pests in cotton with synthetic insecticides and Bt toxins. Annual Review of Entomology.
7. Kemal, M., & Tibebu, T. Field efficacy of synthetic insecticides against Helicoverpa armigera in legume and cotton crops. Journal of Agricultural Sciences (pesticide field results).
8. Aboua, G., et al. Environmental impacts and efficacy of synthetic insecticides for crop pests. Environmental Toxicology and Chemistry (synthesis on pesticide impacts).
9. Xo‘jayev Sh.T “O‘simliklarni zararkunandalardan uyg‘unlashgan ximoya qilish, hamda agrotoksikologiya asoslari.,Toshkent-2014., 133-136 bet.
10. Xo‘jayev Sh.T “Umumiy va qishloq xo‘jalik entomologiyasi hamda uyg‘unlashgan himoya qilish tizimining asoslari.,Toshkent-2019., 106 bet.
11. Xo‘jayev Sh.T “Qishloq xo‘jaligida pestitsidlarni ishlatish hamda tadqiqot o‘tkazish usul va shartlari”Toshkent-2020. 103-105 bet.
12. Xo‘jayev Sh.T ”Pestitsid va agroximikatlarni ro‘yxatga olish sinovlarini o‘tkazish yuzasidan uslubiy ko‘rsatmalar”. Toshkent-2023. 44-46 bet.