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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MAR 12 1991

MEMORANDUM

Subject: Texas Request for the Emergency Exemption to Use MVP Bioinsecticide to Control the Diamondback Moth on Cole Crops (91-TX-04).

From: Linda K. Bass, Ph.D., Entomologist
Biological Analysis Branch
Biological and Economic Analysis Division (H7503W)

Yvette Hopkins, Economist
Economic Analysis Branch
Biological and Economic Analysis Division (H7503W)

To: Robert Forrest
Emergency Response Branch
Registration Division (H7505C)

Thru: Allen L. Jennings, Director
Biological and Economic Analysis Division (H7503W)

We have reviewed the emergency exemption request to use MVP bioinsecticide to control the Diamondback moth on cole crops in Texas. The following discussion is offered for your consideration:

Biological Aspects

The diamondback moth, Plutella xylostella (L), is a major pest of cole crops (cabbage, broccoli, cauliflower) in Texas. The only damaging stage of this pest is the larval stage. The larvae will feed on the leaves creating holes in the foliage rendering the crop unmarketable.

According to the 1991 Insect Control Guide, carbaryl, diazinon, endosulfan (Thiodan^R), azinphos-methyl (Guthion^R), cryolite (Kryocide^R), methomyl (Lannate^R), and permethrin (Ambush/Pounce^R) as well as the B.t. products, Cutlass, Javelin and Dipel are recommended for use to control the diamondback moth

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(DBM) caterpillars on cole crops. However, the applicant claims that the currently registered synthetic products are no longer effective against this pest due to the development of resistance in the population. No data were submitted with this request to support this assertion. The B.t. products however, are said to provide some control.

Efficacy studies found in the 1990 Insecticide and Acaricide Tests showed that the synthetic compounds are less effective at controlling the DBM than the B.t, products. Also, when comparing the efficacy of the B.t. products alone, Cutlass was more effective than Javelin which was more effective that Dipel. Information obtained through conversations with experts (Gelernter, 1991; Sparks, 1991) supports these findings.

The present application states that MVP bioinsecticide will give better control of the DBM than the already registered products. Data contributed by Mycogen, the producer of MVP, showed that MVP gave better control of DBM larvae than Javelin and Dipel. However, according Sparks (1991) and data from other efficacy studies (Oloumi-Sadeghi, et al., 1990; Shelton, et al., 1990; Zehnder and Speese, 1990), the control achieved with MVP was not significantly different from that of Cutlass or Javelin.

There are, however, several factors that may make MVP more attractive to growers. Sparks (1991) stated that MVP was specifically designed to control the DBM. Gelernter (1991) of the Mycogen Corporation reported that MVP is composed of a "cell-cap" system which allows it to be more effective against the pest for a longer period of time.

Thus, based on the information submitted with the submission, telephone conversations, efficacy studies and other pertinent information, we believe that MVP may have some advantages over the currently registered products. However the significance of these advantages cannot be accurately determined with the available information.

Economic Aspects

There are several aspects of this exemption request that are incomplete or confusing. The stated yield impacts of DBM are confusing. The submission states that expected losses are: 15% of cabbage, 9% of broccoli and 9% for cauliflower. There is no statement regarding how these losses compare to the normal losses to make this situation non-routine. In examining historic data, the only crop showing a downward trend in yield suggestive of resistance problems is cauliflower. In fact, the yields for broccoli and cabbage were higher in the late 1980s than earlier in the decade. Given the indeterminate nature of the yield losses and the biological conclusion of equal efficacy of MVP with the currently registered product Cutlass, we find that no significant economic loss is likely to occur without the use of MVP.

Summary

The state is requesting the use of MVP bioinsecticide on cole crops to control the DBM stating that this compound would provide better control of the pest than the currently registered products. According to the available efficacy studies however, control achieved with the use of MVP is not significantly different from the control obtained by the registered B.t. product Cutlass. Yield loss estimates do not differentiate between the expected yield loss and the normal yield loss. Therefore we do not find that significant economic losses will occur.

Attachment(s)

References

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Gelernter, W. 1991. Mycogen Corp. San Diego, CA. Personal Communication. 2/28/91. (619) 453-8030.

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Jansson, R.F., S.H. Lecron and J. Hernandez. 1990. Management of Lepidopterous Pests of Cabbage, 1989. Insecticide and Acaricide Tests. vol. 15. p.89.

Linduska, J.J. 1990. Control of Cabbage Looper, Diamondback Moth and Imported Cabbageworm on Cabbage. Insecticide and Acaricide Tests. vol. 15. p. 93

Oloumi-Sadeghi, H., C.E. Eastman and K.K. Kinney. 1990. Effect of Formulations of Bacillus thuringiensis var. Kurstaki on Lepidopterous Pests of Cabbage, 1989. Insecticide and Acaricide Tests. vol. 15 pp. 94-95.

Shelton, A.M., W.T. Wiley and S.D. Eigenbrode. 1990. Control of Diamondback Moth with MVP Bioinsecticides, 1989. Insecticide and Acaricide Tests, 1989. vol. 15. p.98.

Sparks, A.N. 1991. Extension Entomologist. Weslaco, Texas. Personal Communication. 3/1/91. (512) 968-5581.

Zehnder, G. and Speese, J., III. 1990. Control of Lepidopterous Larvae on Fall Cabbage, 1989. Insecticide and Acaricide Tests. vol. 15. p.99.

Record of Communication

Type: Telephone

Date: 2/28/91

Telephone No: (619) 453-8030

Time: 12:35 pm

To: Wendy Gelernter
Mycogen Corp.
5451 Oberlin Drive
San Diego, CA 92121

From: Linda Bass, Ph.D.
US EPA H7503W
410 M Street, SW
Washington, D.C.
20460

Subject: Section 18 Request to Use MVP Bioinsecticide on Cole Crops to Control the Diamondback Moth in Texas.

1. MVP is composed of a "cell cap" type of system.

2. MVP activity last longer than the other B.t. products (last 2 to 3 times longer).

3. MVP will kill all larval stages of this pest.

4. As far as effectiveness is concerned, MVP is more effective than Cutlass which is more effective that Javelin or Dipel.

5. There is no advantage of using any of the synthetic compound with MVP.

Signature _____

Date _____

Record of Communication

Type: Telephone

Date: 3/1/91

Telephone No: (512) 968-5581

Time: 9:55 am

To: Dr. Alton N. Sparks
Extension Entomologist
2401 East Highway 83
Weslaco, TX 78596

From: Linda Bass, Ph.D.
US EPA H7503W
410 M Street, SW
Washington, D.C.
20460

Subject: Section 18 Request to Use MVP Bioinsecticide on Cole Crops to Control the Diamondback Moth in Texas.

1. There are many registered pesticides for use against the diamondback moth (DBM) on cole crops. However, these insects have developed resistance to all of the synthetic compounds.

2. Cutlass, Javelin and Dipel are also registered for control of this pest. Cutlass gives better control than Javelin which provides better control than Dipel.

3. Currently growers are using the B.t. products early and the B.t. products plus a synthetic compound later in the season (after cupping). These combinations normally provide good control.

4. MVP gives better control than any of the other B.t. products.

6. Statistically, there is no difference in the percent control obtained by MVP and Cutlass, however the values for MVP are better. Example- MVP= 85 to 90% control and Cutlass= 80 to 85% control. This usually occurs in small plots where reinfestations can occur.

7. Farmers get good control with MVP.

8. MVP is requested to be used to reduce the selection pressure by the DBM for the synthetic compounds.

9. Number of acres treated is estimated to be 15,000 to 16,000 statewide (based on historical data).

10. MVP was specifically designed for the DBM. Because of the cell cap system it is active longer on the plant.

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11. In unsprayed plots, predators and parasites have about a 18 to 20% parasitism rate. However in unsprayed plots there are problems with aphids.

12. Treatment for DBM is taking place now. However the heaviest treatment will take place in the late spring.

13. It is difficult to give an estimate of potential yield loss without MVP.

14. MVP was used on an "Experimental Use" permit last year.

Signature _____

Date _____