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## Preliminary studies on controlling *Oulema oryzae*, soybean aphid, and cucumber aphid with “Mieshabi”

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**Abstract:** This paper reported the insect control experiments with a newly developed insecticide, “Mieshabi”. Results indicated that “Mieshabi” was very effective on controlling *Oulema oryzae*, soybean aphid, and cucumber aphid. Thus, it is a good insecticide at present and can be applied in agricultural practice.

**Keywords:** *Oulema oryzae*, soybean aphid, cucumber aphid

“Mieshabi” is a newly developed insecticide with high efficiency, low toxicity, low residue, long residual action, and broad spectrum. It mainly acts as a contact and stomach insecticide, and has repellent and pupicidal effects as well. We conducted control studies on *Oulema oryzae*, soybean aphid, and cucumber aphid with “Mieshabi” in 1992. The insecticidal effects of “Mieshabi” on the tested insects were all above 90%. “Mieshabi” is abundant in source materials and has the advantages of low cost and ease of use. Thus, it has very good prospects for application.

## MATERIALS AND METHOD

### I. Materials.

Insecticides: (1) 21% “Mieshabi” emulsion oil, provided by FengRun pesticide factory, Hebei Province; (2) 30% “Yangle-qingju” emulsion oil, manufactured by Shenyang Research Institute of Chemical Industry; (3) 40% Rogor emulsion oil, purchased on the market.

### II. Methods.

The experiments were conducted at Huapichang town, Yongji County. The experimental design and methods were as follows:

1. *Control experiments on Oulema oryzae.* Plot control experiments: five treatments with 3 replicates were 225 mL, 300 mL, and 375 mL “Mieshabi” per hectare, 300 mL “Yangle-Qingju” per hectare, and non insecticide control, which were randomly arranged on plots of 35 m<sup>2</sup>. The sprayings were applied on July 2. Demonstration field experiments: the sizes of the demonstration fields were 1.67 hectares for treatments and 0.067 for the control. The six treatments were 225 mL, 300 mL, and 375 mL “Mieshabi”, 300 mL “Yangle-Qingju”, 1500 mL Rogor per hectare, and non insecticide control. The treatments were arranged in the above listed order without replicates. The sprayings were applied on July 2.

2. *Control experiments on soybean aphid.* Plot control experiments: six treatments with 3 replicates were 225 mL, 300 mL, and 375 mL “Mieshabi” per hectare, 300 mL “Yangle-Qingju” per hectare, 1500 mL Rogor per hectare, and non insecticide control, which were randomly

arranged on plots of 34 m<sup>2</sup>. The sprayings were applied on July 2. Demonstration field experiments: the sizes of the demonstration fields were 1.67 hectares for treatments and 0.067 for the control. The six treatments were 225 mL, 300 mL, and 375 mL “Mieshabi”, 300 mL “Yangle-Qingju”, 1500 mL Rogor per hectare, and non insecticide control. The treatments were arranged in the above listed order without replicates. The sprayings were applied on July 2.

3. *Control experiments on cucumber aphid.* Six treatments were 225 mL, 300 mL, and 375 mL “Mieshabi” per hectare, 300 mL “Yangle-Qingju” per hectare, 1500 mL Rogor per hectare and non insecticide control, which were arranged on plots of 20 m<sup>2</sup> in the above listed order without replicates. The sprayings were applied on July 12.

All the insecticides in the above listed treatments were sprayed after mixing with 50 kg of water to the insecticides. The control effects of all the treatments were examined with the diagonal sampling method on the third day after the sprayings. We examined twenty plants per spot in the plot experiments and 100 plants per spot in the demonstration field experiments. The control effects were calculated by the surviving insects.

## RESULTS

### 1. Insecticidal effects on *Oulema oryzae*

1) Insecticidal effects in plot experiments (Table 1). Results showed that the control effects of “Mieshabi” on *Oulema oryzae* were between 92.3% and 98.2%, which were better than that those of “Yangle-Qingju”.

Table 1. Insecticidal effects on *Oulema oryzae* in plot experiments

Item	Treatment	“Mieshabi” 225 mL/hectare	“Mieshabi” 300 mL/hectare	“Mieshabi” 375 mL/hectare	“Yangle-qingju” 300 mL/hectare	CK
Surviving aphids (#/100 plants)		78	59	18	79	1011
Control effects (%)		92.3	94.2	98.2	92.2	

2) Insecticidal effects on *Oulema oryzae* in demonstration fields (Table 2). Results of demonstration field experiments indicated that the insecticidal effects of “Mieshabi” on *Oulema oryzae* were between 93.3% and 97.6%, which were similar to the results in plot experiments and much better than those of “Yangle-qingju”.

Table 2. Insecticidal effects on *Oulema oryzae* in Demonstration fields

Item	Treatment	“Mieshabi” 225 mL/hectare	“Mieshabi” 300 mL/hectare	“Mieshabi” 375 mL/hectare	“Yangle-qingju” 300 mL/hectare	CK
Surviving aphids (#/100 plants)		63	49	22	68	936
Control effects (%)		92.3	94.8	97.6	92.7	

### 2. Insecticidal effects on soybean aphids

1) Insecticidal effects on plot experiment (Table 3): The results of plot experiments showed that the control effects of “Mieshabi” on soybean aphid were between 94.9% and 98.9%, which were better than those of “Yangle-qingju” and much better than those of Rogor.

Table 3. Control effects on soybean aphid in plot experiments

Treatment Item	“Mieshabi” 225 mL/hectare	“Mieshabi” 300 mL/hectare	“Mieshabi” 375 mL/hectare	“Yangle-qingju” 300 mL/hectare	Rogor 1500 mL/hectare	CK
Surviving aphids (#/100 plants)	30	18	7	37	308	592
Control effects (%)	94.9	97.0	98.8	93.8	48.0	

2) Insecticidal effects in demonstration fields (Table 4). The field demonstration experiments showed similar results as in the plot experiments. The insecticidal effects of “Mieshabi” on soybean aphid were between 93.6% and 98.7%, which were better than those of “Yangle-qingju” and much better than those of Rogor.

Table 4. Insecticidal effects on soybean aphid in field demonstration experiments

Treatment Item	“Mieshabi” 225 mL/hectare	“Mieshabi” 300 mL/hectare	“Mieshabi” 375 mL/hectare	“Yangle-qingju” 300 mL/hectare	Rogor 1500 mL/hectare	CK
Surviving aphids (#/100 plants)	38	21	8	41	152	597
Control effects (%)	93.6	96.5	98.7	93.1	74.5	

### 3. Insecticidal effects on cucumber aphids

Results in Table 5 showed that the control effects of “Mieshabi” on cucumber aphid were between 93.5% and 97.3%, which were higher than those of “Yangle-qingju” and significantly higher than those of Rogor.

Table 5. Insecticidal effects on cucumber aphid in plot experiments

Treatment Item	“Mieshabi” 225 mL/hectare	“Mieshabi” 300 mL/hectare	“Mieshabi” 375 mL/hectare	“Yangle-qingju” 300 mL/hectare	Rogor 1500 mL/hectare	CK
Surviving aphids (#/100 plants)	152	76	63	150	974	2323
Control effects (%)	93.5	96.7	97.3	93.5	58.1	

## SUMMARY

1. The 21% “Mieshabi” emulsion oil can be used in the control of *Oulema oryzae*, soybean aphid, and cucumber aphid. Its control effects on *Oulema oryzae* were between 92.3% and 98.2% in plot experiments and between 93.3% and 97.6% in field demonstration experiments, which were all better than those of “Yangle-qingju”. Its control effects on soybean aphid were between 94.9% and 98.8% in plot experiments and between 93.6% and 98.7% in demonstration field experiments, which were higher than those of “Yangle-qingju” and significantly higher than those of Rogor. The control effects of “Mieshabi” on cucumber aphid were between 93.5% and 97.3%, which were better than those of “Yangle-qingju” and much better than those of Rogor.

“Mieshabi” had significant control effects on *Oulema oryzae*, soybean aphid, and cucumber aphid. Its control effects were better than the insecticides currently on the market and could be applied and spread in agricultural practice.

**2.** The proper application dosages of 21% “Mieshabi” emulsion oil for control of *Oulema oryzae* and soybean aphid are 225 to 300 mL per hectare. And 225 mL per hectare is enough for controlling cucumber aphid.

**3.** The effective period of “Mieshabi” is about 10 to 14 days. It cannot be mixed with alkaline insecticides; otherwise, the control effects may be reduced. Strong acidic compounds may decompose “Mieshabi” and should be avoided. Once the spraying solution is prepared, it should be applied without any delay. The diluted insecticide may hydrolyze or precipitate upon prolonged storage. If small amount of crystal appears or the solution separates into layers during spraying, the solution should be shaken to achieve a single phase.

**4.** The 21% “Mieshabi” emulsion oil is abundantly available, and has the advantages of low usage level, low cost and easy to use.