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This article summarizes experiments at a practical level, effects and the mode of action of this formulation to various growth stages in life cycle of powdery mildew fungus on an application of machine oil emulsion concentration for control of cucumber powdery mildew.

I here with report the following results.

1. This formulation is effective to all powdery mildew on various plants including cucumber powdery mildew and has excellent control effects much more than fungicides which are used so far.
2. This formulation effects much more effectively by spray application at very early stage that powdery mildew fungus have penetrated into plants, than spray application before penetration of powdery mildew fungus on surface of plants.

This formulation is effective only on sprayed sites and has no systemic activity to other sites.

3. Powdery mildew is one of the general diseases. The disease is spread rapidly after it break out once and plants have great damages, therefore many types of fungicides are used. Consequently resistant powdery mildew fungus are widely distributed. This formulation showed always constant control effects to these resistances.

4. This formulation consists of 97.5% petroleum oil and 2.5% of surfactant. Individual spray application of petroleum oil and surfactant showed less control effects, but the mixture of both chemicals had excellent effects.

By trials of various ratios of both chemicals, the mixture of 99.0 - 97.5% of petroleum oil and 1.0 - 2.5% of surfactant showed best control effects.

5. The effects of this formulation to various growth stages of powdery mildew fungus were investigated. In case of spray application before inoculation, significant inhibition effects were not observed on conidial germination, mycelial growth and formation of penetration site. But when this formulation was

sprayed after inoculation, more than 95% of conidial germination, mycelial elongation and conidial formation was inhibited. On the other hand, when this formulation was sprayed in a stage of conidiophore formation, oily film was coated around conidiospores were contracted and nearly 90% of conidiospore elimination was inhibited. These conidiospores caused no disease on cucumber.

6. When this formulation was sprayed to crops, oily film was formed on the surface. The film is correlated with effects of this formulation. When this formulation was sprayed to powdery mildew fungus on cucumber plants, oil droplets on leaves produce oily film with water evaporation. Conidia were trapped in the oily film and they were contracted by pressure with diminution of oily film. This formulation showed similar effects to conidiospores on mycelia and conidiophore. By this effect, cytoplasm of powdery mildew fungus condensed and cell became nearly empty, and the fungus died out in 24 hours after spraying of this formulation.

7. When this formulation was sprayed to powdery mildew fungus placed on dialysis membrane, respiration of fungi was clearly inhibited, absorption amount of oxygen and exhaust amount of carbon dioxide decreased by 55% and 57%, respectively in comparison with control. It was confirmed that decrease of the respiration amount was caused by the effects of oily film formed around conidia of powdery mildew fungus.
8. Occurrence of adverse effects and influences on growth were investigated after spraying to cucumbers, which were cultivated under different conditions. Consequently adverse effects were hardly shown and no influence was observed on growth and harvest amount of cucumber.

Therefore, it is concluded that this formulation is usable practically as control fungicides for powdery mildew.