

# Sluggish but Destructive Pests

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Grey garden slug, eggs, and feeding damage

Slugs are a global agricultural problem. The grey garden slug, native to Europe, is the most economically damaging in the Northwest. This slug poses problems for a variety of industries including the nursery, grass seed, Christmas tree, and row crops. Oregon grass seed growers, alone, report an economic loss of \$100 million annually.



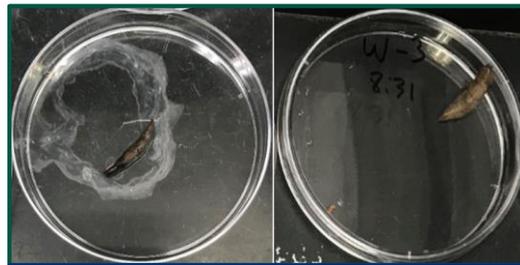
Eggs hatching

Current control practices rely on chemical pellet bait-based products. Efficacy depends on slug pressure in the field, timing and frequency of applications, and weather conditions. Also, with routine chemical use, there are negative impacts on the environment, human health, and the potential of chemical resistance. Thus, it is our goal to find an alternative control method that is more environmentally friendly.

The molecular approach in the Choi lab is to look at biological tools to provide control. We

focus on neuropeptides and receptors because these proteins are essential to physiological processes during all slug life stages. We identified a number of bioactive peptides that have significantly reduced slug survival when the slug was treated with bioactive peptides. The new mode of action is the receptor interference mechanism.

We will continue to identify potential targets of bioactive peptides from the slug. Bioassays utilize an insect cell line to express the slug target gene which can be measured for expression levels in the experiments. Our long-term goal is to develop a biopesticide with high specificity towards the grey garden slug that would provide an effective means of control in a field or nursery environment.



Slugs treated with a bioactive peptide (left) & water control (right)

Any questions or suggestions, please contact Man-yeon Choi ([mychoi@usda.gov](mailto:mychoi@usda.gov)) or Kelly Donahue ([kelly.donahue@usda.gov](mailto:kelly.donahue@usda.gov)) in the USDA-ARS HCRU.



Various native and invasive pest slugs in Oregon

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