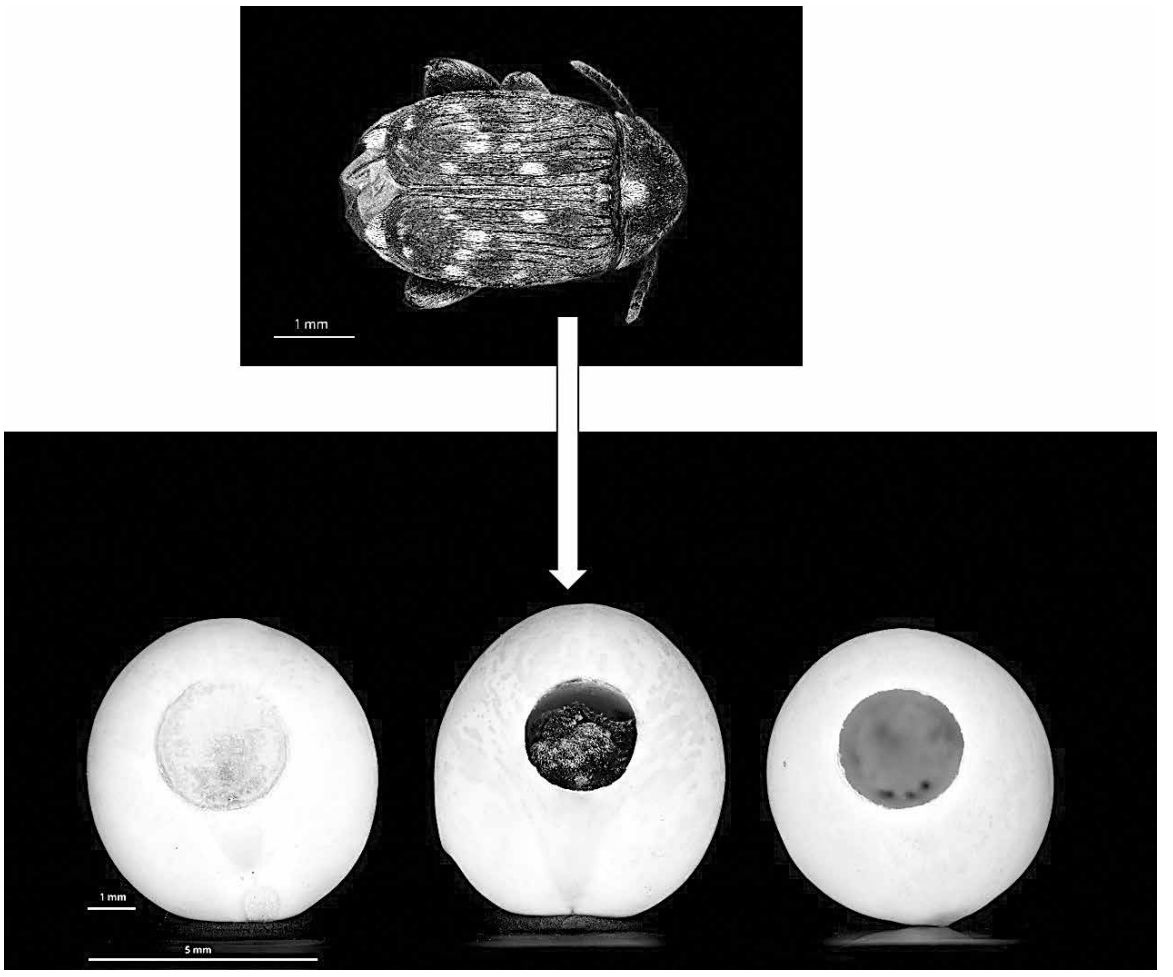


Fig 1. Pea weevil and damaged pea seeds with exit holes.

# Developing management strategies for the pulse insect pest

**By Gadi V.P. Reddy, Debra A. Miller, Ramadevi L. Gadi and Govinda Shrestha, Montana State University Western Triangle Agricultural Research Center, Conrad, MT**

Montana growers' interest to cultivate pulse crops has increased immensely in the recent years because of less profitable farming from cereal crops globally and the interest in expanding crop diversity. In the past four years, pulse crops such as lentils, peas and chickpeas have increased in acreage from 600,209 to 1,209,039 in Montana. Currently, Montana ranks #1 in the production of field peas, producing 48% nationally. The increased acreage aprompted strong pressure from pulse growers for methods to manage insect pests that are causing yield losses.

The insect pests that are currently present in Montana pulse crops include: pea leaf weevils, pea aphids, lygus bugs, armyworms, cutworms, wireworms, grasshoppers, and leaf hoppers. Pea leaf weevil has been primarily considered as a major pest of pulse crops, but in the last three years, other pests such as pea aphid and lygus bug are also inflicting economic damage in Montana. Additionally, pea weevil Bruchus pisorum is one of the most problematic insect pests on peas. Damage by this beetle was reported for the first time in the Hi-Line area of Montana in 2014. This has alarmed Montana pea growers and stakeholders because this pest could easily spread to neighboring pea growing areas.

Pulse crops are especially susceptible in the seedling stage from pea leaf weevils' damage and in the flowering and early pod stages from pea aphids and lygus bugs

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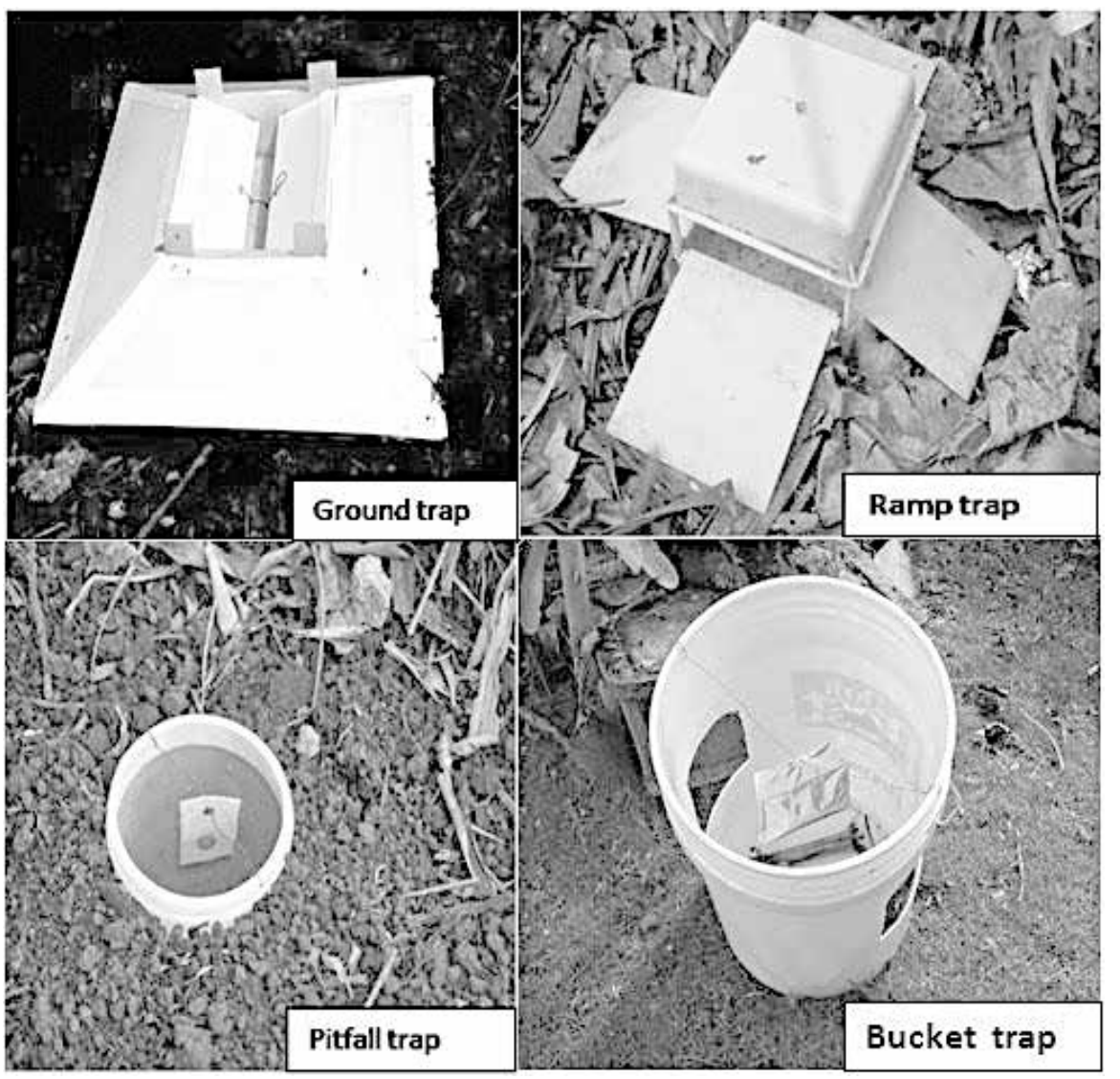


Fig 2. Different traps were tested to catch the pea leaf weevil. The pitfall traps outperformed all others.

# Developing management strategies for the pulse insect pest

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damage. Especially developing pea seeds are vulnerable to pea weevil damage as larvae feed inside the seeds (Fig 1). It has been reported that pea weevil infestations can range anywhere between 30-70% of the crop. Affected peas cannot be sold for human consumption, seed germination is reduced, and the market price for livestock feed is diminished. The feeding of these pests on these critical growth stages reduce pulse yield levels. The pertinent issues that have been requested for help for pea leaf weevil management from growers or extension agents encompass: suitable pulse varieties with high yielding and resistant towards pest damages; appropriate synthetic insecticides for use; and economic threshold level for treatment application. Concerning to pea aphids and lygus bugs, pulse growers are usually requesting our assistance to determine the threshold level and suitable synthetic insecticides for their management.

To combat all the above mentioned pest problems, Montana State University Western Triangle Agricultural Research Center (MSU-WTARC) has been consistently developing and expanding research and extension activities for integrated pest management of pulse crop insect pests. For pea leaf weevil management, research team has been working on the development of pheromone based monitoring and mass trapping system. The project was funded under the USDA program 2015-Montana Specialty Crop Block Grant. The studies indicated that among the traps tested, pitfall traps caught higher number of weevils than other traps (ramp, delta and ground traps) tested. The pitfall traps baited with pheromone rubber septa caught higher number of catches than the bubble septa and trap without pheromone septa (Fig 2). In addition, in 2016, research team has also evaluated the efficacy of five commercially available biopesticides against pea leaf weevil under the laboratory condition: Mycotrol ESO®, Pyrethrin, Xpectro OD®, Xpulse OD® and Entrust WP® (spinosad 80%). Among the five tested products, Spinosad (Entrust WP®) was found to be most effective product, Mycotrol ESO® and Xpectro OD® as moderately effective and the Xpulse OD® and PyGanic EC® as less effective products. In summary, our laboratory results suggest that Spinosad, Xpectro and Mycotrol play an important role in managing pea leaf weevil in Montana.

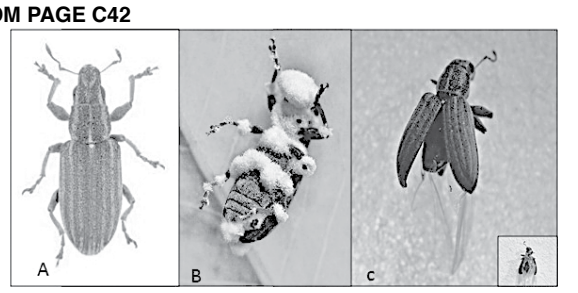

Fig 3. (A) Uninfected pea leaf weevil adult, (B) Xpectro/Mycotrol killed pea leaf weevil adult and (C) Spinosad killed pea leaf weevil adult.

The USA Dry Pea & Lentil Council, 2780 W Pullman Rd, Moscow, ID 83842-4024 has funded a project on "New pest in Montana-Pea weevil: Determining weevil population distribution, abundance, and pea damage assessments" to take up the studies during the year 2016-17. Research team members are currently surveying twenty field sites and six elevators (Chinook/Harlem, Choteau, Conrad South, Tiber/Rudyard, Fort Benton and Havre) in the Hi-Line area to determine the damage potential and distribution of the pea weevil. This on-going survey will allow us to determine what action must be taken to prevent further spread of this weevil. If significant levels of damage and noticeable population levels are observed, efforts will be made to obtain a USDA-APHIS permit to introduce the egg parasitoid of the pea weevil (Uscana senex) into Montana. This parasitoid, native to Chile and Brazil, is reported to offer effective control of this pest -up to 82% parasitism rate.

Dr. Reddy and his team members' future plans not only include research and extension activities on pea leaf weevil and pea weevil management but to develop overall integrated pest management strategies for pulse insect pests across Montana. Some of the future research goals at WTARC that are planned: assessment of pea and lentil varieties of Montana resistant from pea leaf weevil damages; validate the economic thresholds; assessment of synthetic insecticides and biopesticides for their potential to control pulse insect pests and also their impact on natural enemies of pulse insect pests and; optimization of attract and kill method.

For more information about the pulse insect pests and its management contact any of the WTARC team members at 406-278-7707.

# International Day of Friendship

Date When Celebrated : July 30

The world is filled with too much hatred, too much fighting, and too much mistrust of others. The International Day of Friendship is certainly an opportunity to stop, and to reverse, these worldwide problems.

According to the United Nations, the official sponsor of this special day, the International Day of Friendship is a day set aside to promote friendship among peoples, cultures and countries. Today is a time to encourage efforts towards peace, and to build bridges among different people. It is a day of respect for others, and a day to celebrate diversity.

According to the United Nations, on this day people, groups and governments should hold events and activities to promote mutual understanding and reconciliation.

On an individual level, use this day to promote friendship in big and small ways. You can begin by "extending an olive branch" to a sibling or a family member, a neighbor, or an old friend who we've had a falling out with. If we all try just a little the world will be a better, more peaceful place.

***Origin of International Day of Friendship:***

The origin of International Day of Friendship has roots as far back as 1919 in the United States. The country of Paraguay first celebrate this day on an national level on July 30, 1958. Other countries with early celebrations include: several countries in South America, Bangladesh, India, and Malaysia. Different countries celebrated this day on varying dates in July, August and April.

In 2011, the United Nations declared this an official international day, to be celebrated annually on July 30th.