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Southern cowpea weevil appears as a new pest on pulse crops

By Gadi V.P. Reddy, Anamika Sharma and Govinda Shrestha, Montana State University, Western Triangle Agricultural Research Center, Conrad, Montana

Agriculture is the major backbone of the Montana economy. Along with cereal production, pulse is an integral part of Montana farming system. Montana is a leading state in US pulse production. Pulses are mainly harvested for dry seeds and other than being a good protein source, its production also improve soil health and promote biodiversity. Nevertheless, like other parts of the world Montana pulse production is also affected by insect pests and disease infestations which causes major economic losses.

After pea weevil, recently, a new pulse pest reported in Montana is, the Southern cowpea weevil, *Callosobruchus chinensis*. Similar to pea weevil, it is a stored seed feeder, belongs to the family Chrysomelidae under the order Coleoptera, and commonly known as beetles and weevils. There are many species of *Callosobruchus* that have been attacking pulses in different parts of the world but one of the most common ones is Southern cowpea weevil. It has a wide host range including peas, chickpea, pigeon pea, garden peas, cowpeas, mung beans, black-eyed peas, soybeans, lima beans, lentils, and wild legumes. However, Southern cowpea weevil is mainly considered as an economically important pest in cowpea, lentils, green gram and black grain worldwide. In Montana, this weevil has been confirmed by entomologists from lentil shipping containers in the last few years (since 2015). Although Southern cowpea weevil is a major problem in the tropical climate, it is distributed around the globe comprising Asia, Africa, Canada, South

America, and Australia. It is known to be more common in Southern United States. Transportation often plays an important role in the movement of this pest.

Adult Southern cowpea weevil is about 4mm (0.16 inch) in length and have long antennae, legs, and wings. They are usually brownish in color but some adults may look greenish brown (Figure-1). For their defensive purposes, adults "play dead" when disturbed and resume their movement after 5–10 min. This is also most common feature in many other beetles and weevils' species. It is an internal feeder and if the seeds are stored in a warm, humid place, life cycle will be completed in about 20–23 days. Female adults lay and glue eggs on seed surface of host plants. The flat bases of translucent eggs help them to remain stuck to the surface of the seeds. They can lay as many as 90 eggs during their lifetime. At optimum temperature of 90–95F, eggs hatch in 5–6 days and the first instar larva then burrows deep into the seed through the base of the seed. All larval stages complete within the single seed, where they go on hidden and sheltered as they feed. The final instar larva pupates within the seed. Soon after emergence from the pupa, the adult crushes its way out of the seed, leaving a distinctively curved exit hole in the seed's casing. Adults live for a short period of time (about two weeks) and known as very fast fliers and fast runners. The feeding damage and adult exiting holes cause a reduction in germination and poor market value of pulses.

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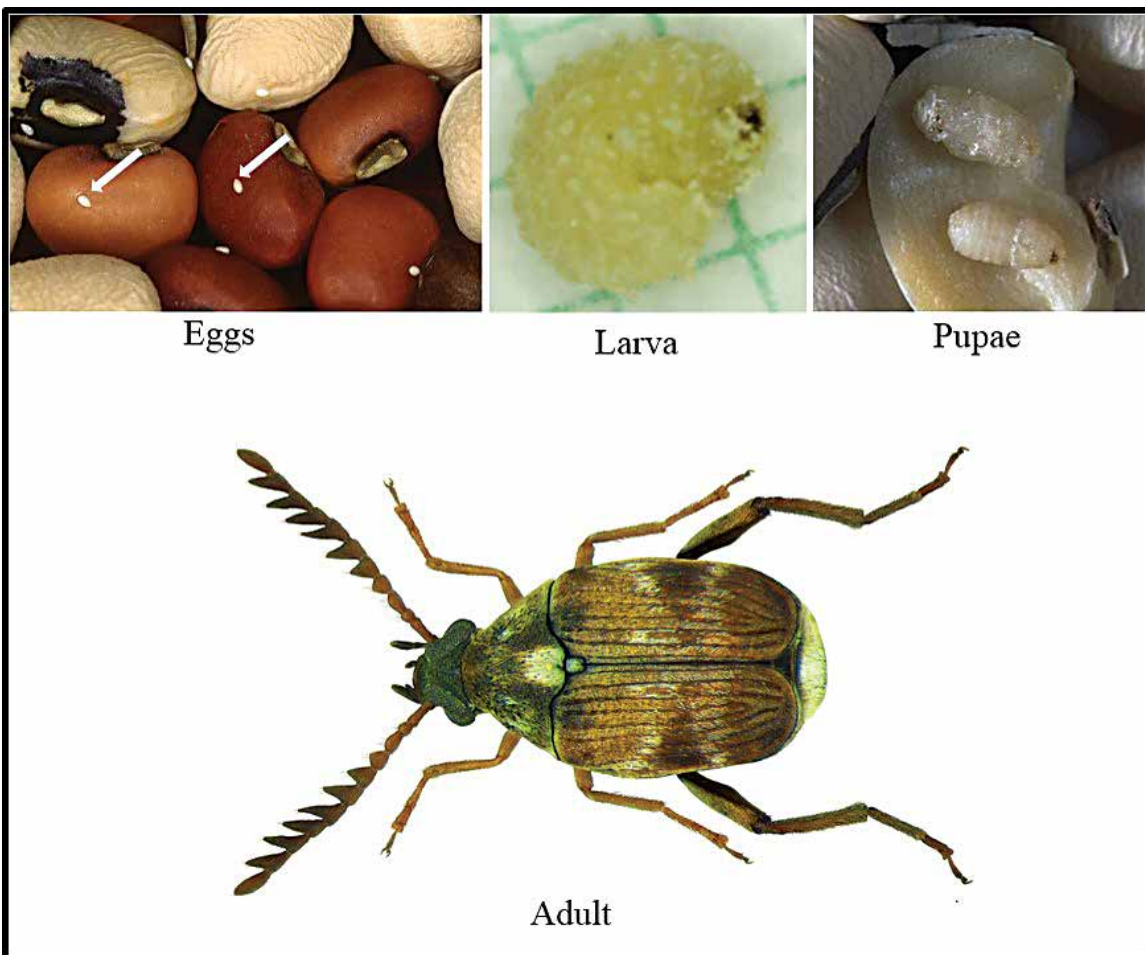


Figure-1: Life stages of Southern cowpea weevil (*Callosobruchus chinensis*). Photos courtesy of: https://en.wikipedia.org/wiki/Callosobruchus_chinensis; http://agritech.tnau.ac.in/crop_protection/crop_prot_crop_sto_insect_primary_pest_5.html; <https://www.beanbeetles.org/handbook/>

ITEMS FOR SALE



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Temperature and humidity greatly influence the development and survival of these weevils. The favorable temperature for this insect to complete all life stages ranges from 93F to 100F. A personal communication with Dr. Sanford Eigenbrode (University of Idaho) indicates that there are least chances of overwintering of this weevil in Montana and Idaho due to less tolerance of eggs and larval stages to low temperatures of Montana climate. For example, 14F can kill the eggs in less than 3 hours and 41F in five days. However, during the summer season

they can indeed infest isolated fields. Once they are in stored seeds, heating to 135F for 3–4 hours can kill them.

Management strategies for this insect include chemical, cultural and biological management. As chemical management, fumigation of infested stored seeds and spraying with organophosphates chemicals to minimize the infestation is recommended. Good hygiene habits while storing the seeds and the removal of infested crop residue from the field are also other recommended

HAY AND EQUIPMENT FOR SALE

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 (Approximately 200 ton) pea hay, round bales, 122 RFV
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practices for its management. Moreover, drying and heating can be used to manage an infestation of seeds without affecting seed germination. As the biological control, some less explored egg (*Uscana lariophaga*), larval and pupal parasitoid (*Dinarmus basalis*) are also known.

Several behavioral aspects of Southern cowpea weevil matches with the pea weevil such as the timing of emergence, egg laying on the presence of exit holes on peas hence it is easy to get confused among both the insects. Nevertheless, Southern cowpea weevil can be distinguished from pea weevil by the presence of very long legs and antennae and also by its vast host range. Pea weevil is host specific to peas whereas Southern cowpea weevil can infest several legumes as listed above.

Management of Southern cowpea weevil is challenging due to difficult monitoring of eggs and development of larvae within the seeds. In the early stages of infestation this insect can go unnoticed, and only after the presence of exit holes its presence can be identified, hence a vigilant attitude will be necessary to keep this insect under control in Montana.

If somebody notices any damage to seeds and presence of exit holes on any legumes please contact Entomology/ Insect Ecology team members via phone, 406-278-7707 or email, reddy@montana.edu.

Moldy Cheese Day



Date When Celebrated: Always October 9

Moldy Cheese Day is today. Do you have any moldy cheese in your refrigerator? Do you need to have moldy cheese to celebrate this day? And, if you have any moldy cheese, what would you do with it today?

Every once in a while, we come across a special day that has no apparent rhyme or reason. Today is one of those days. But, that doesn't mean you shouldn't celebrate this wonderful(?) and special holiday. Au contraire..... scour through the refrigerators at home and work today for moldy cheese. Office refrigerators are a great place to find moldy stuff. See if that moldy piece of cheese is salvageable. And, just enjoy the day.

If you find moldy cheese, take a slice off each side. The insides should still be good.

Did you Know? Mold is common in cheese. Its part of what gives a particular cheese flavor and character. For example, the blue stuff in Blu Cheese is mold.

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