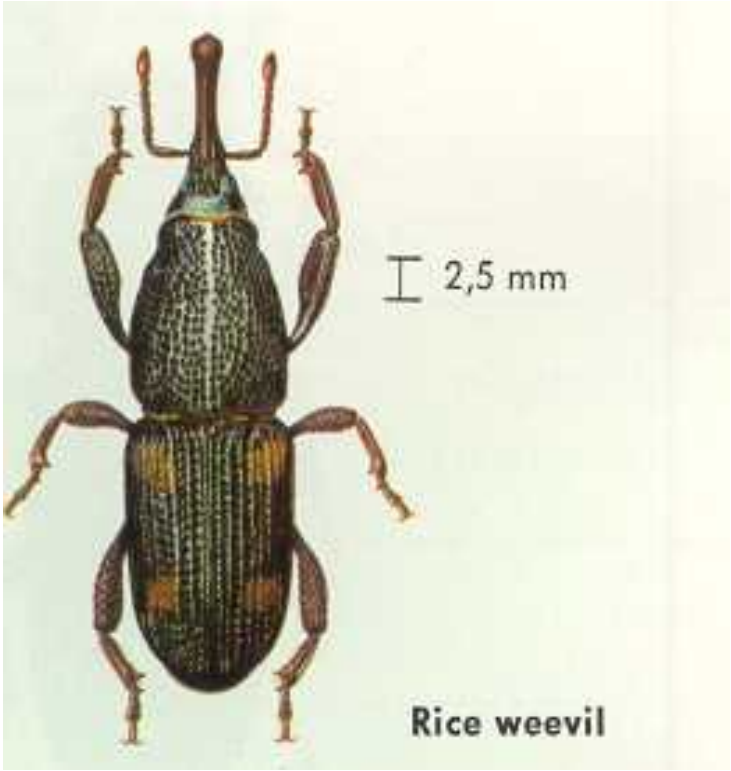
RICE WEEVILS

FAMILY : Curculionidae

SPECIES : *Sitophilus oryzae*

IDENTIFICATION CHARACTERISTIC

Rice weevils range in size from 1/8 inch to 3/16 inch (3.1 to 4.8 mm) and are dark reddish-brown in colour. The thoracic pits of a rice weevil are round or irregular in shape. Rice weevils often have four light-coloured patches on its elytra (wing covers), but these are not always present or visible.



BIOLOGY AND LIFE CYCLE

The rice weevil prefers warmer climates and so is more prevalent in the southern states. These weevils “play dead” when disturbed by

drawing their legs close to the body and then lying still for several minutes. Rice weevils are internal feeders which means the larva develops inside whole grain kernels. Mating often occurs within 24 hours of adult emergence from grain kernels. Using her long, slender mouthparts, the female rice weevil bores a small hole into a grain kernel and then lays an egg in the hole. After sealing the hole with a gelatinous material, she proceeds to the next kernel to repeat the process. Over her life span of four to five months, the female will lay from 300 to 400 eggs, although as a general rule about 50 % of the eggs do not hatch. The egg hatches into a short, stout "C" shaped larva that is creamy white and has no legs. The larva feeds by chewing away at the inside of the grain kernel and will eventually hollow out the inside of the kernel. In warm conditions, the period from egg to pupa can last as few as 26 days but usually takes longer. After pupation, the adult beetle remains inside the kernel maturing and hardening. The adult then chews its way out leaving a small round hole in the grain. These open, round holes are a sign of a weevil infestation and are distinguished from the exit holes of the angoumois grain moth which leaves a little, hinged "lid" over the hole. Rice weevils are prolific breeders and can build up huge populations in stored grain to the point where the grain has little value as a food product. Literally tons of rice weevils have been screened out of heavily infested grain.

DAMAGE

Rice weevils mainly attack whole grains such as wheat, corn, barley and rice, however they have been found actively breeding in such foods as macaroni and spaghetti when those materials are old and have become caked. They also have been reported to feed on beans, nuts, cereals, and have been observed sucking the juice from apples and pears. In homes, infestations are generally found in bird seed, nuts, decorative Indian corn and in rare instances, in old pasta stored in cupboards. The adults feed basically on the same foods as the larvae but not as restricted in their diets because the larvae need to develop inside whole grains. Rice weevils have well developed wings and are strong fliers. Flight also helps rice weevils infest grains stored at far ends of warehouses. Most infestation, however originated from nearby sources on infested grain.

INSPECTION AND MANAGEMENT

The key to control rice weevil is to determine where whole grains nuts and seeds are stored. Grain spillage on the ground and the floor can accumulate in cracks and the rails of storage racks and create breeding sources for the weevils. In grain elevators, grain commonly falls off conveyors and accumulates underneath. If not removed periodically, this spilled grain becomes a source for the infestation of new grain as it is brought into the building. When inspecting grain in bags of stored grain, it is best to use a grain probe to remove small quantities of grain for closer observation. If weevils are in the grain, the adults will be removed as will damaged grain kernels. If the grain is heavily infested, the infestation will be visibly evident. When rice or granary weevils are present in grain for a period of time, other stored product beetles and moths may infest the grain. When these weevils are most often found infesting larger quantities of grain in storage bins, silos, grain elevators and bags of stored grain warehouses, fumigation is generally the only treatment option. If smaller packages or quantities of infested grain are involved, the grain can be discarded and the cracks in the area where the infested grain was stored treated with a residual insecticide. Small packages of grain can also be frozen for six days at -18^{0}C to kill all life stages. Empty grain storage bins and silos often are not cleaned properly and can be left empty for considerable periods of time. In this situation, the bin must be cleaned as much as possible and the storage bin treated with an appropriately labeled residual insecticide prior to new grain being stored in that facility.

GRANARY WEEVILS

FAMILY : Curculionidae

SPECIES : *Sitophilus granarius*

IDENTIFICATION CHARACTERISTIC

Granary weevils range in size from 1/8 inch to 3/16 inch (3.1 to 4.8 mm) and are dark reddish-brown in color. Each species closely resembles the other and are most easily distinguished by the shape of the pits on the prothorax just behind the head. The pits on the granary weevil are oval in shape. Another closely related species is the maize weevil. Sitophilus zeamais. The maize weevil is larger than rice weevil but so closely resembles it in appearance that the two are not easily separated.

Granary weevil

BIOLOGY AND LIFE CYCLE

The biology if the granary weevil is very similar to that of the rice weevil. The eggs are laid in the same manner as the rice weevil, although granary weevils have been noted to lay more eggs in larger rather than smaller grain kernels. The life cycle can be completed in as little as 30 to 40 days during the summer but takes considerably longer in cooler

conditions. Adult granary weevils can live up to eight months and can produce up to four generations per year.

DAMAGE

Granary weevils infest whole wheat, corn, barley, rice, acorns, sunflower seeds, and old macaroni and other pastas that have become caked. If granary weevils larvae are found within bags of flour, it is unlikely they are feeding there but merely migrating through. Infestations located in storage bins, silos and grain elevators have been found to a depth of about five feet. The grain deeper than that is usually too warm to support the weevils' survival. Granary weevils have poorly developed wings and do not fly. The adults are wanderers and will often be seen crawling about near infested areas.. Due to this lack of flight, granary weevils do not infest grains in the field and are found only in stored grains while relying on man for its distribution to other buildings and around the world.

INSPECTION AND MANAGEMENT

When rice or granary weevils are present in grain for a period of time, other stored product beetles and moths may infest the grain. Don't be surprised to find flour beetles, flat grain beetles or even foreign grain or fungus beetles in severely infested grain. In addition, other internal feeders, such as lesser grain borers, may be present in the grain. Such infested grain has normally not been well cared for or stored properly. When these weevils are most often found infesting larger quantities of grain in storage bins, silos, grain elevators and bags of stored grain warehouses, fumigation is generally the only treatment option. If smaller packages or quantities of infested grain are involved, the grain can be discarded and the cracks in the area where the infested grain was stored treated with a residual insecticide. Small packages of grain can also be frozen for six days at -18^{0}C to kill all life stages. Empty grain storage bins and silos often are not cleaned properly and can be left empty for considerable periods of time. In this situation, the bin must be cleaned as much as possible and the storage bin treated with an appropriately labeled residual insecticide prior to new grain being stored in that facility.