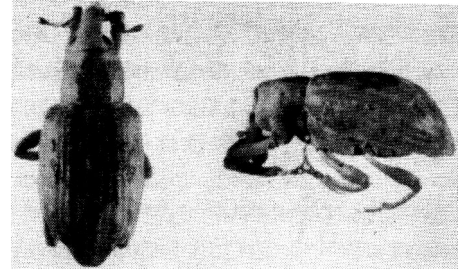


Rice Water Weevil

beetle pest in rice growing areas of southern states discovered in California

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Adults of the rice water weevil, *Lissorhoptrus oryzophilus* Kuschel. Greatly magnified.

Young rice plants damaged by the rice water weevil—*Lissorhoptrus oryzophilus* Kuschel—were found in fields near Biggs on June 1, 1959.

The weevil is widely distributed in the rice growing states of the south, and ranges through the Atlantic states into Canada feeding on grasses in swampy areas. Judging from the abundance of the weevil at the Rice Experiment Station and in an adjacent field it is assumed that the pest was introduced prior to 1959, although the June discovery apparently is the first record of the weevil in California.

Larvae of the weevil—commonly called root-maggots—feed on the roots of the rice plants causing a characteristic pruning of the roots. This type of feeding prevents the development of new roots—until the peak of larval feeding is over—resulting in yellowing of plants, delayed growth, and decreased yields. Adults leave slitlike feeding scars on the leaves.

Although the rice water weevil is a potential pest of California rice its severity will depend upon its ability to reproduce and spread under California conditions. Losses reported in the southern states vary from 1% to 75% depending upon the area, cultural practices, and populations of the weevil present.

The adult is a small, grayish brown weevil with a dark, indistinct area on the back, and is about 1/8" long. The dark, dorsal area is more distinct in the female

and in moist specimens. In the water, the weevil appears darker and may assume a greenish tinge. The beak or snout is wide. All specimens observed at Biggs were females suggesting that just females were introduced.

Eggs laid in the laboratory were white, elongate, slightly curved inwardly on one side, with rounded ends and were about 1/28" long and one third as wide. The

Close-up of larvae and damage to rice plant.



larvae are about 1/2" long when mature, are long for weevil larvae, milky white in color, legless, and with a light brown head. There are paired dorsal hooks—modified spiracles—on each of the dorsal aspects of abdominal segments two to seven. The hooks project forward and arise from ridges on the folds of each segment. The large tracheal branches inside the body can be seen in live specimens. It is believed that larvae can tap air spaces in or about the roots and obtain oxygen even though submerged. The aquatic habitat, elongate body, and dorsal hooks, and crescent-shaped ap-

pearance will usually serve to differentiate larvae of the rice water weevil.

The pupa is found in an oval cell of mud attached to roots of rice or grasses. The pupa is white in color and the size of the adult.

The life history has not been worked out for California conditions. At Biggs adults were active on June 1 and by July 1 in the same checks mature larvae were found on the roots of rice and water grasses. Adults lived in cages about three weeks. Observations made by several investigators in the southern states give a range in the life history from egg to adult of 35-80 days. In Arkansas, rearings indicated an egg stage of 7-8 days; larval feeding period of 28-35 days; and pupal period of 5-14 days; for a total range of 40-57 days.

The adult weevil when ready to deposit eggs crawls down the rice stem and inserts the ovipositor in one of the principal roots forcing the ovipositor through the epidermis of the root. The egg is placed longitudinally just inside the epidermis. One investigator reports that the female chews on the root prior to oviposition thus affording an opening for the ovipositor. Several eggs may be laid in one spot.

The larvae feed for awhile inside the roots then move out to attack other roots making a series of holes. The larger, third instar larvae feed externally among the roots often pruning off the roots and sometimes feed up into the crowns. Often several larvae are found among the roots of a single plant.

The mature larva gathers about itself an egg-shaped mass of soil which it attaches to a root. The oval pupal cell is water tight and the larva spins a silken sac about itself.

In the southern states two generations

Rice plants showing larvae and pruning of roots left. Undamaged plants on right.



Incidence of Feeding of Rice Water Weevil in Relation to Distance from Bank. Plants 11.5"-14" high—Biggs, June 6, 1959.

Distance from bank (feet)	No. Leaves examined (25 plants)	No. leaves and total number feeding scars at designated levels of attack								Total no. feeding scars
		0		1-4		5-10		11-20		
		L	S	L	S	L	S	L	S	
0-5	73	11	0	28	56	21	136	13	170	362
5-10	74	56	0	11	21	7	37	0	0	58
10-20	73	62	0	10	23	1	5	0	0	28

L = leaves; S = feeding scars.

