



Jack Kelly Clark

Residual rice seed is critical food for waterfowl

Michael R. Miller □ Glenn D. Wylie

The most important wintering region for waterfowl migrating along the Pacific Flyway is the Sacramento Valley, but the valley no longer has enough wetlands to sustain the birds. As a result, rice seed left in fields after harvesting has become a critical food for waterfowl that winter in the valley. Rice is a particularly important source of food for green-winged teal, pintail, widgeon and mallard ducks; and white-fronted, Canada, snow and Ross' geese. Other birds that feed on residual rice include pheasants, sandhill cranes, mourning doves and black-birds.

Prior to our field work in the mid-1980s, there was no reliable information on the amount of rice remaining in harvested fields. We randomly selected test fields from a large list of rice growers willing to cooperate. We vacuumed seeds from randomly located plots in more than 100 harvested fields both before and after burning, and found that after harvest there was an average of 346 pounds of rice per acre and that after burning there was an average of 246 pounds of rice per acre. After harvest but before burning, 260 pounds of rice per acre lay directly on the ground while the balance (86 pounds) lay on the straw stubble. During the mid-1980s all rice was harvested with conventional cutter-bar technology, which cuts the rice stalks, leaving stubble.

In the 1990s, rice growers began to use stripper headers, which strip seeds off the seed heads, leaving otherwise-

intact plants rather than stubble after harvest. Use of stripper headers is likely to increase because many growers believe this technology is more efficient than conventional techniques, so we decided to reapply our mid-1980s field sampling techniques to test the new technology. In 1993, we did so, developing estimates of how much rice was left in strip-harvested fields.

We found that there was an average of 306 pounds of rice per acre after strip harvesting (meaning it was, from the growers' standpoint, a more efficient method). As was the case after conventional harvesting, about 260 pounds of rice per acre lay directly on the ground after strip harvesting. But only 46 pounds of rice per acre remained in the straw (still attached to seed heads) — about half the 86 pounds per acre that remained in straw after conventional harvesting.

Moreover, while nearly two-thirds of the sample plots in the conventionally cut fields had more than 225 pounds of rice per acre, this was true in only about half of the sample plots in the stripped fields. In other words, the residual rice was more evenly distributed in conventionally cut than stripped fields. That would suggest that waterfowl probably can forage more easily in conventionally cut fields because there is more rice remaining in the straw and the rice is more evenly distributed.

However, the implication of our results must await final development of the most efficient operating criteria for

stripper technology, analysis of any improvements in conventional harvest efficiency since the 1980s, and the ultimate balance between strippers and conventional harvesters in the Sacramento Valley.

We do not yet know how stripper technology affects waterfowl's use of residual rice. Preliminary National Biological Service data suggest that snow geese avoid stripped fields when the stripped rice is left standing. The findings also show that geese use stripped fields more during late winter, when the rice plants have been flattened by wind and rain. Currently we do not have any data on the use of stripped fields by ducks, which normally feed at night; no one has conducted night studies yet. We also need information on how efficiently waterfowl and other birds forage in conventionally cut, stripped, mowed, chopped, disked, burned, flooded and dry rice fields. Getting this information will require an extended commitment by both natural resource and agricultural interests. This information will be critical to waterfowl managers in assessing the carrying capacity of the Sacramento Valley for wintering waterfowl, and in planning conservation programs that protect rice lands and restore wetlands.

M.R. Miller is Wildlife Research Biologist and G.D. Wylie is Wildlife Research Biologist, U.S. National Biological Service, California Science Center, Dixon.