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THE DICKCISSEL
A PROBLEM IN RIPENING GRAINS IN LATIN AMERICA

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Bird damage to crops in Latin America--from Mexico to Venezuela and Colombia-is chiefly caused by fringillids, icterids, and psittids (De Grazio and Besser, 1970). Damage to grains such as rice and grain sorghum by various fringillids-sometimes referred to as "chisguas" by local landowners-is especially troublesome. The fringillid most often implicated in major problems is the dickcissel *(Spiza americana).*

Dickcissels are not known to cause serious damage problems within their breeding range, which is chiefly the prairies and hay meadows of the central United States. In August, small postbreeding flocks congregate, and by September and October these coalesce into much larger feeding and roosting aggregations as the birds migrate through Central America, reaching their wintering grounds in Colombia, Venezuela, Trinidad, Guyana, and Surinam in November and December (Ffrench, 1967). The return to breeding areas apparently begins in March and peaks in April. The spring migration is much more rapid than the fall migration, as most dickcissels are back on their breeding territories in May (Bent, 1968:158-191).

It may seem strange that the dickcissel, a relatively small bird of about 25 grams, can cause such large problems. However, the quelea *(Quelea quelea),* which causes extremely severe losses in Africa, weighs only about 17 grams. Seedeaters of the genus *Sporophila* cause problems in crops in Latin America, and one of the commonest, the ruddy-breasted seedeater *(S. minuta),* weighs only about 7 grams.

In the fall, the funneling of the dickcissel population through Central America coincides with the onset of the dry season and the ripening of cultivated grains in this area. In Nicaragua, Koone (1969, personal communication) and Edwards (1969, personal communication) reported thousands of dickcissels attacking rice and grain sorghum plantings. In Costa Rica, Slud (1964) labeled the dickcissel "the supreme pest of the ricefield." Most farmers in Central America have learned not to dally in harvesting their crops or birds, often dickcissels, will "assist" them in the harvest.

Most dickcissels winter on the savannahs and llanos of Venezuela and Colombia and on occasion cause great damage to the few crops left on farms on the perimeter of these dry grasslands. In the files of the Denver Wildlife Research Center there are complaints of severe dickcissel damage in Venezuela dated as early as 1947. Fortunately, the harvest in nonirrigated areas is nearing completion by the time dickcissels arrive in South America. However, with more lands being irrigated there each year, trouble with dickcissels may become more common.

Dickcissels also damage crops on their return northward. In 1967, in the state of Tabasco, Mexico, sorghum fields grown in newly cleared jungle in the basin of the Rio Grijaiva were severely damaged by dickcissels (Puente, 1969-personal communication). Damage in spring is of shorter duration, because of the urgency of reaching the breeding territories.

Predicting damage by dickcissels is complicated. The major portion of the dickcissel's diet before the introduction of cultivated cereals was, undoubtedly, native grass seeds. Our observations have led us to believe that most dickcissels prefer small wild millets (e.g., *Echinochloa)* over cultivated grains; this belief is bolstered by the studies of Ward (1965), who found that the diet of queleas contained only 4 percent cultivated grains compared to about 70 percent small wild grass seeds, such as *Echinochloa* and *Oryza*. In Latin America, the supply of wild grass seeds varies somewhat with climatic conditions, and when they are scarce on the savannahs, cultivated crops on adjacent areas are more likely to be heavily damaged. We suspect that populations of seed-eating birds that breed in Latin America, especially several species *of Sporophila* and grassquits, have an important relationship to the availability of wild grass seeds and the damage done by migrant dickcissels.

Conventional methods of frightening birds from fields by patrols and mechanical devices do not appear to be very effective for reducing damage by dickcissels, because they, like most fringillids, do not respond very well to loud noises. In severe damage situations, crop-growers sometimes have resorted to using extremely high application rates of toxic insecticidal sprays to kill birds feeding in crops or loafing in bushes or small trees along field borders. This practice is not only expensive but hazardous, and probably results in unacceptable residue levels in the crop.

The use of chemical frightening agents, such as employed by Woronecki et al. (1967), is presently the most promising technique for reducing dickcissel damage. This year, we found that dickcissels responded with excellent distress displays when force-fed grain sorghum seeds containing about 1.5 percent 4-amino-pyridine, or a dose of about 20 mg/kg of the dickcissel's body weight. In tests this year in grain sorghum fields in Venezuela and Mexico, we found that broadcasting sorghum treated with 4-aminopyridine at low application rates--as low as 1 pound of chemical per 4,000 acres-resulted in many birds giving distress displays, which frightened and dispersed the flocks. In both countries, fields were frequently cleared of hundreds or thousands of birds; responses were similar to those obtained with blackbirds in cornfields in other studies (De Grazio, 1964). Some dickcissels continued to return for several days after baiting, however, and it may be that dickcissel flocks do not avoid an area after a disturbing experience for as long a period as blackbird flocks do.

In summary, migratory dickcissels cause sporadic but severe damage to rice and grain sorghum crops in Latin America. Damage appears to be inversely related to the availability of native wild grass seeds. Conventional methods of protecting crops are of little value against dickcissels. The chemical frightening agent, 4-aminopyridine, holds promise for reducing dickcissel damage to grains.

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