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BIRD DAMAGE TO AGRICULTURAL CROPS IN THE UNITED STATES - A CURRENT SUMMARY

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Introduction

Determination of the importance and distribution of bird damage to agricultural crops in the United States has been emphasized by the Section of Birds at the Denver Wildlife Research Center in recent years. Our studies can be placed in two general categories: (1) For some crops we have conducted statistically designed quantitative field surveys to determine bird damage and have extrapolated from test plot data, and (2) for other crops we have directed questionnaires to persons knowledgeable about bird damage. Questionnaire surveys are obviously subjective and are biased to an unknown degree, but for some crops there is no reasonable alternative method of determining bird damage over regional or continental areas. Questionnaires at least serve to indicate the general level of damage and the relative seriousness of the problem to the grower. Such information is vital in setting research and management priorities and in determining the economics of damage control practices.

The total bird damage picture includes the frequency distribution of losses as well as the average loss. Bird damage is usually unevenly distributed among growers and "average" damage rarely occurs. A crop that yields a good profit margin on the average may be a failure for those growers that suffer heavy losses to birds. The distribution of damage among growers is therefore considered a very important component of loss in the following summary. Details of design, analysis, and results of the studies I have summarized can be found in the original reports cited, all of which have been or will be published elsewhere.

Grain Crops

Quantitative surveys of direct bird damage to ripening field corn were conducted in cooperation with the Statistical Reporting Service, U.S. Department of Agriculture, in 25 major corn-producing states in 1970 and in 19 in 1971 (Stone *et al.,* 1972; Stone, 1972; and Stone and Mott, 1973). Birds (principally blackbirds) were estimated to have damaged a mean of 0.13 and 0.16 percent of the corn produced in 1970 and 1971 in the states surveyed. Bird damage to field corn in the United States was estimated to average 6.2 and 6.8 million bushels in 1970 and 1971 for the 2 years. Although the estimated direct corn loss to birds averaged only 0.11 bushel per acre each year, about 1 percent of the growers (0.92 and 1.82 percent in 1971 and 1970, respectively) suffered losses of more than 3 bushels per acre.

A questionnaire survey directed to 337 wildlife and agricultural specialists in 25 states in 1972 indicated that the loss of corn sprouts to birds ranged from 6.3 to 32.5 million bushels (Stone and Mott, 1974). The southeastern and mid-Atlantic states experience the most serious problems, and entire fields are sometimes replanted there after severe sprout pulling by birds. In some states reporting the most serious damage, 2 percent of the total acreage may be destroyed.

Bird damage to sunflowers in North Dakota and Minnesota in 1972 was estimated through field examination of 48,700 ripening sunflower heads in 18 counties. Birds damaged 9.7 percent of the heads and preliminary estimates suggest that about 1.2 percent of the total damageable surface area of all heads had been removed by birds (Stone, unpublished data). An additional 9.0 percent of the heads showed wind damage and an estimated 0.9 percent of the total damageable surface area of all heads had been lost. Of all fields checked, 13.4 percent had bird damage of 20 percent or more of all heads and 3.1 percent had bird damage on 50 percent of all heads; 11.7 percent of the fields had wind damage on 20 percent or more of the heads.

Bird damage to ripening rice in California was estimated in 1972 by surveying 30 randomly selected fields in a 72 square-mile rice-growing area near Colusa (DeHaven and Crase, 1973). Damage was determined by visual estimation of rice panicles in 20 3-foot plots along each of two randomly chosen transects per field. Damage by blackbirds was determined to average less than 0.2 percent in the fields surveyed in 1972. Only seven of the fields had blackbird damage, and the most severe damage incurred was less than 3 percent. On the basis of food consumption capabilities, food habits and analyses, length of the damage season, and maximum bird populations present, losses were estimated to be about 0.1 percent in the Sacramento Valley, which produces about 90 percent of California's rice (DeHaven, 1971; Crase and DeHaven, 1972). A questionnaire survey sent to 1,650 Valley rice growers and returned by 230 also suggested that total losses were far less than 1 percent of the crop (Crase and DeHaven, 1972).

Fruit Crops

A questionnaire survey directed to 78 knowledgeable individuals in 14 states in 1972 indicated that birds damage at least 5 percent of the highbush blueberries grown in the United States (Mott and Stone, 1974). Of the respondents who expressed an opinion, 85 percent thought that bird damage to blueberries was at least as serious as damage caused by insects, hail, wind, and rain, and 61 percent thought that bird damage was more serious than frost damage. Frost damage was unusually severe in some states in 1972.

A questionnaire sent to California Agricultural Commissioners and a random sample of California grape growers suggested that birds destroy less than 1 percent of the total grape crop (Crase and DeHaven, 1973) worth approximately $1.3 million. An estimated 40 percent of California grape growers experience bird damage, and the growers believed that 52 percent of this damage is "moderate" to "serious." The results of a quantitative survey of grape damage in California and questionnaire data from grape-growing states other than California are currently being analyzed.

Results of a quantitative survey of bird damage to tart cherries in Michigan are presented elsewhere in this Seminar (Stone, 1974). In brief, between 7.4 and 17.4 percent of the state's potential tart cherry production, worth $1.8 to $4.3 million to growers, may have been lost to birds in 1972. If losses in the 64 sample orchards are representative of all losses, approximately 11 percent of Michigan growers lose 51 percent or more of their tart cherry crop to birds.

Discussion

The foregoing results should be viewed with caution because: (1) many are based on qualitative rather than quantitative data; (2) definitive quantitative information requires larger sample sizes than are practical in some cases; and (3) factors associated with the year in which damage surveys were conducted may have influenced results. It does seem likely, however, that bird damage is more important in fruit than in grain crops, in terms of both the proportion of the total crop lost and the proportion of individual growers suffering heavy losses.

Acknowledgments

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