

BIOLOGICAL EVALUATION OF SEED AND CONE INSECTS ON TWO
SEED PRODUCTION AREAS ON THE PINEY RANGER DISTRICT,
OZARK NATIONAL FOREST, ARKANSAS

by

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INTRODUCTION

Increased demand for pine seed in greater quantities and of higher quality has increased interest in the insects affecting seed production of pine. High-valued seed production areas have been established to produce these seed. Each year in the South, a high percentage of the potential seed-crop areas is lost to insects. In this evaluation, we are concerned with the losses of shortleaf pine, Pinus echinata Mill., seed. The seed from this species of southern pine are less abundant than those from any of the other southern pines.

On February 25, 1965, P. J. Barry, D. E. Ketcham, and H. N. Wallace, Forest Insect and Disease Control Branch, U. S. Forest Service, began a biological evaluation of 2 shortleaf pine seed production areas on the Piney Ranger District, Ozark National Forest, Arkansas. Ranger Jack Reichert accompanied them.

The 2 seed production areas, Granny Gap and Salus (figure 1), were established in the summer of 1962. Cones collected from these areas during the evaluation were dissected in the laboratory. Diorystria spp. was the insect causing the major damage to the cones. The only damaged cones were those that would have produced seed last fall.

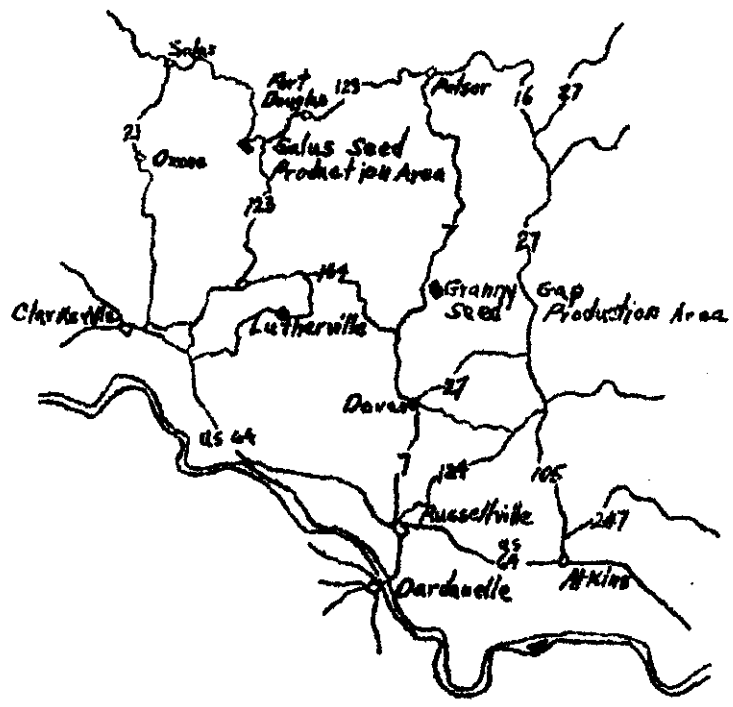
TECHNICAL INFORMATION

Causal agent.--Cone worms, Diorystria spp.

Host tree attacked.--Shortleaf pine, Pinus echinata Mill.

Type of damage.--Damage caused by Diorystria larvae is either partial or complete cone mortality caused by extensive tunneling in the cone scales of first- and second-year cones. The larvae also tunnel in branch tips causing complete loss of the cone crop produced by that branch tip.

Biological data.--Approximately 226 cones were collected from the Granny Gap seed production area during the evaluation. None of the



■ Seed Production Areas

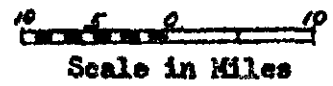


Figure 1. Gramy Gap and Salus Seed Production Areas, Ozark National Forest, Arkansas.

212 first-year cones or cones that will produce seed this fall showed any damage by insects. Four of the remaining 14 second-year cones or cones that produced seed last year showed damage due to Dioryctria spp.

Environmental factors.--At this time, the influence of environmental factors upon the insect population is not known. However, large insect populations are associated with large cone crops (1). On both of these areas, a good crop of cones will mature in the fall of 1965.

Location and intensity of outbreak.--Granny Gap, a 210-acre seed production area, is located about 17 miles north of Russellville, Arkansas, in T10N, R20W, S14. Salus, a 131-acre seed production area, is about 27 miles northwest of Russellville in T12N, R22W, S34 (figure 1).

DISCUSSION

During the evaluation, 226 cones were collected and dissected in the laboratory. Fourteen of the cones were second-year cones that produced seed last fall. The other 212 were first-year cones that will produce seed this fall. During the dissection, 2 young Dioryctria larvae of the second or third instar were found in 1 of the 4 damaged, second-year cones. None of the first-year cones were damaged by insects. At this time, it seems that Dioryctria in this area is doing most of its damage during the cones' second growing season.

The amount of damage to cones and conelets by insects seems to vary with the number of cones present on the trees. Trees heavily loaded with cones seem to receive more damage than trees with a poor cone crop (1). Cone production on both seed production areas was very high last spring, and the large number of cones that will mature this fall could lead to a high insect population buildup. A sample from these cones showed no damage during dissection. Because Dioryctria seems to do most of its damage to the cones during their second growing season, control is recommended. Other factors leading to the recommendation of control are the high cost of establishing these areas and the demand for high-quality seed in quantity.

IMPACT OF CONTROL ON OTHER RESOURCES

Low-volume application of benzene hexachloride and lindane at the rate of 1 pound per acre should have no adverse effects on other resources.

RECOMMENDATIONS

1. Spray Granny Gap seed production areas with 4 applications of BHC at the rate of 1 pound per acre by helicopter. The first application should be applied at the time the trees begin to flower,

usually the first few weeks in April. The other applications should take place the first part of May, the last of June, and the last part of July.

Salus seed production area should be sprayed with lindane at the rate of 1 pound per acre. Timing of application will be the same as that on the Granny Gap area.

2. Forest Insect and Disease Control personnel should give technical assistance during application.
3. A more intensive biological evaluation should be made during the growing season of the trees. A post-control evaluation report should be made by Forest Insect and Disease Control personnel immediately following the operation.

REFERENCES

1. Yearin, W. C. 1961. Insects Capable of Infesting Pine Cones and Seeds of Arkansas. Master's thesis, University of Arkansas, Fayetteville, Arkansas.