Spring and Summer Counts of Longleaf Pine Seeds Per Cone Related to October Yields

by

Thomas C. Croker, Jr.

Principal Silviculturist

Southern Forest Experiment Station USDA Forest Service Brewton, Ala.

***Predictions** from August counts of seed per exposed face of sectioned longleaf pine cones are more reliable than those from spring counts in determining fall yields.*

Seed yields per cone are needed to make reliable seed-crop forecasts. Overall averages in the South may vary from 50 seeds per longleaf pine cone in good years to 15 in poor years.[1]

McLemore[2] devised a technique for estimating seed yields by counting the number of exposed seeds in cross-sectioned cones. But his data were collected on ripe cones. Similar counts made earlier on green cones in August or even on conelets in the spring might also accurately predict yields of ripe seed. A study was made in southern Alabama during 1972 and 1973 to see if this was reliable.

Methods

Longleaf pine *(Pinus palustris* Mill.) strobili-conelets and cones-were collected in April, August, and October in 1972 and 1973, from 17 sample trees. At each collection, 10 strobili were selected from each tree. Most sample trees were the same in both years. Each cone or conelet was sectioned lengthwise with a sharp knife, and the number of full seeds counted on the exposed face. The counts were easier to make if the tissue surrounding the seed coats was allowed to turn brown-a matter of a few minutes. (A delay of more than 10 minutes may brown the seed to the point that counts are difficult to make.) Averages from each tree were computed from the 10 sample strobili, and the 2 years' data were pooled for analysis.

Results and Discussion

From compiled data, this study determined that the spring count of seeds per exposed face was about three less than the fall count. The summer count was .2 less than the October estimates.

A seed worm, thought to be *Laspeyresia ingens* is suspected as the cause for the spring variance. Insect damage-estimated at 35 percent-occurred between April and August, but not later in the year. No insect damage was evident between the August and October counts in 1972 or 1973.

While these findings indicate it is possible to estimate October seed-percone averages from earlier counts, it should be noted that they are computed from only 2 years' data from one locality. Additional checks would be needed to determine how well the values fit a given locality.

The following data established the relationship of spring seed per exposed face to fall counts:

$Y = X - 2.9$

$r^2 = .57$

Significance Test

Source	DF	SS	MS	F
Regression	1	555.0	555.0	41.9*
Residual	32	424.0	13.25	
Total	33	979.0		

Confidence limits (95 percent level) on the mean of Y at the mean of X(11.6) = 8.7 ± 1.7 seeds. $(X - X)^2 = 551$.
*Significant at 0.05 level.

Relationship of summer seed per exposed face to fall counts was provided by the following data:

$Y = -.2 + .996X$

$r^2 = .76$

Significance Test

Source	DF	SS	MS	F
Regression	1	747.0	747.0	103.0*
Residual	32	232.0	7.25	
Total	33	979.0		

Confidence limits (95 percent level) on the mean of Y at the mean of X(8.9) = 8.7 ± 1.1 seeds. $(X - X)^2 = 753$.
*Significant at 0.05 level

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1 Croker, T. C., Jr. Longleaf pine cone production in relation to site index. stand age, and stand density. USDA For. Serv. Res. Note SO-156. 1973.

2 McLemore, B. F. Predicting seed yields of southern pine cones. J. Forestry 60:639.641. 1962,