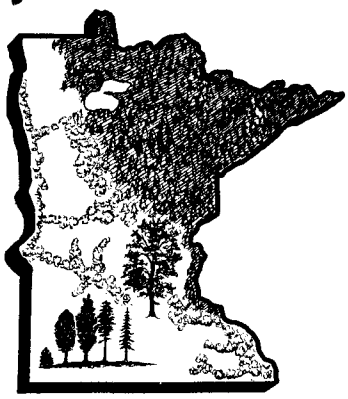

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EFFECT OF TIME OF SHEARING RED PINE CHRISTMAS TREES ON BUD FORMATION AND LEADER GROWTH

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Shearing pines intended for Christmas trees has become general practice where the producer is interested in high quality. However, the ideal time for shearing in Minnesota and the differences resulting from shearing at various times are not well defined. The objectives of this experiment have been to measure the effect of time of shearing on the size and number of buds resulting and on the length of terminal growth the following year.

A five-year-old planting containing several hundred red pine (Pinus resinosa Ait.) trees on the Rosemount Agricultural Experiment Station was selected for the study. To eliminate the confounding of bud formation and leader growth with the inherent vigor of trees selected, two vigor classes were established: high, with leaders from 17 to 21 inches, and low with leaders from 8 to 13 inches long. Trees of good form were selected and their leaders measured until 30 trees in each vigor class were obtained. Ten trees from each vigor class were randomly selected for shearing on each of three shearing dates: July 8, July 23, and August 5, 1958. These dates were chosen to test whether late-season shearing produces fewer buds and reduced leader growth in the following growing season. The 1958 leader was sheared back to an eight-inch length and the immediately adjacent laterals to less than eight inches. The terminals of lateral branches were also sheared to give the trees an even, conical silhouette.

In late March of 1959, buds along the leader were counted (irrespective of size) and the terminal, or most nearly terminal, bud was measured for length and width. Without exception, buds became progressively larger as the tip was approached. In addition, on each tree counts were made of the number of main lateral branches sheared and of the number of buds formed on each.

Results, as averages for each of the 10 tree groupings are shown in Table 1. Analysis of variance was employed to determine significant differences among lengths and widths of terminal buds and among numbers of buds formed on the leader as related to vigor class and to date of shearing. No significant differences were found between vigor classes except in number of buds formed on the leader where lower vigor classes produced significantly (5% level) fewer buds.

Differences in length and width of the terminal bud and in number of buds on the leader among dates of shearing were highly significant (1% level). The length of the terminal bud was significantly shorter when sheared on July 23 than when sheared on July 8 and similarly when sheared August 5 instead of July 23. Number of buds formed on the leader also showed significant reductions in number between adjacent dates. Width of the terminal bud differed significantly only between July 23 and August 5.

Number of buds formed on the laterals was confounded by having fewer laterals sheared per tree on July 8 than on the two subsequent dates. This confounding was removed by analysis of covariance which indicated no significant difference between July 8 and July 23 but a highly significant (1% level) difference between July 23 and August 5.

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Table 1

Average Length and Width of the Leader Terminal Bud, and Average Number of Buds Formed on the Leader and on the Main Laterals as Related to Time of Shearing and to Tree Vigor

Shearing date	July 8		July 23		August 5	
Vigor class	High	Low	High	Low	High	Low
Length of terminal bud (ins.)	0.47	0.45	0.435	0.33	0.15	0.155
Width of terminal bud (ins.)	0.195	0.17	0.175	0.155	0.07	0.085
Number of buds on leader	11.2	9.4	9.9	6.9	4.0	3.7
Number of laterals sheared	9.2	6.3	14.9	14.0	14.4	14.8
Number of buds on laterals	44.4	28.0	56.5	54.5	3.2	14.4

On August 27, 1959, the sheared trees were measured for length of leader. On trees where all laterals immediately adjacent to the leader were not sheared (some being less than eight inches long at the time of shearing) an unsheared lateral took over the lead. These, as well as the longest growth on the old leader, were measured (Table 2).

Table 2

Average Length of Longest Terminal Growth from Buds Formed Following Shearing and Average Length of the Longest Unsheared Lateral Growth (Where These Exceeded the Terminal) During 1959, the Year After Shearing

Shearing date	July 8				July 23				August 5			
Vigor class	High		Low		High		Low		High		Low	
Source of growth	Term.	Lat.	Term.	Lat.	Term.	Lat.	Term.	Lat.	Term.	Lat.	Term.	Lat.
Average length (ins.)	7.8	19.9	7.6	17.0	7.0	17.4	6.3	18.1	2.5	13.3	4.6	15.4

An analysis of variance applied to the data of Table 2 indicates that the year's growth of both the former terminal leaders and the now dominant laterals was greater for those sheared in July than for those sheared in August. This difference is significant at the 1% level. The two July shearings do not differ significantly in these respects nor is post-shearing growth affected significantly by tree vigor.

In summary, these data for a single year's shearing of red pine in the Twin City area indicate that early August shearing appreciably reduces the length, width, and number of terminal buds when compared with shearings two and four weeks earlier. In addition the length of growth produced by these buds is distinctly reduced. Minnesota growers might be well advised to shear about August 1 anticipating a reduction in subsequent shearing costs. This experiment also demonstrates the need to shear all laterals around the terminals, even though they may be short. Otherwise, one of them will probably take the lead thereby reducing tree quality.

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