The use of the combine and the accompanying tendency to let the oat crop stand in the field after maturity has resulted in a peculiar type of lodging called stem-break. Stem-break is an "old age" form of lodging occurring after the plant is dead ripe.

The use of a lodging resistance factor, $cL_r$, as a measure of lodging resistance in the green plant was developed in a previous paper. This paper on stem-break in senescence makes a natural sequence. Fortunately, resistance to this form of lodging is readily measured by letting the guard rows stand after harvest until the culms start to crinkle or break. Hence the problem is not so much one of measurement and prediction as one of determining the factors involved.

The purpose of this paper is to determine some of the factors involved in stem-break in senescence and to find out if varieties resistant to lodging as measured by the $cL_r$ factor tend to resist stem-break.

**MATERIALS AND METHODS**

The percentage of broken culms (stem-break) was recorded for the guard rows of micro-yield plots in 2 oat nurseries, 11 days after harvest. There were 44 varieties in nursery A and 42 in nursery B, with 3 and 4 replications, respectively. Both nurseries were in the same field, in the vicinity of East Lansing, Mich. Except for three check varieties, each nursery was comprised of different varieties.

Lodging resistance factor readings were taken earlier in the season on the green plant at the early dough stage. The lodging resistance factor has been previously described as $cL_r = \frac{F}{b}$

where $F =$ the weight in grams of chain supported and $b =$ the height to the base of the head in centimeters. The constant $c$ is a factor which converts the height $b$ into force. Five $cL_r$ readings were taken per plot. Hereafter these readings will be referred to as lodging resistance readings.

Date of heading notes were taken according to standard procedure.

The *Leptosphaeria avenaria* G. F. Weber (*Septoria avenae* Frank) notes were taken on a scale of 1 to 5, with 5 being severe. Correlation coefficients were calculated using variety means.

**EXPERIMENTAL RESULTS**

Three factors were observed to be associated with stem-break percentage. These were lodging resistance, maturity as measured by date of heading, and *Septoria* readings. The interrelationship between these factors is most readily established by means of simple correlation coefficients as shown in table 1.

In table 1 it may be seen that coefficients for maturity vs. stem-break and lodging resistance vs. stem-break are highly significant and of about the same magnitude. The relationship between stem-break and *Septoria* readings is significant in one case. It will also be noted that the maturity vs. *Septoria* readings are highly significant. However, the fact that stem-break percentage was examined by three variables which were not independent makes it difficult to draw conclusions from these coefficients. For example, the significant correlation coefficient between stem-break percentage and *Septoria* readings is due to the correlation between maturity and *Septoria* reading and maturity.

The part correlation coefficients in table 2 indicate that lodging resistance and maturity are about equally important in determining resistance to stem-break. This emphasizes the need to take stem-break readings within maturity classes or on comparable dates.