EMASCULATION and cross-pollination of barley is a tedious and
time-consuming process and any method that will bring about an
increase in the percentage of seed set and an increase in the average
weight a seed is of value. If, in cross-pollination, a high percentage of
the flowers set seed, the number of flowers that must be crossed to
obtain a given number of seeds can be reduced and thus bring about
a saving in time and effort. Furthermore, crossed seed as near the
same size as the naturally produced parent seed is also desirable when
the growth of the F1 plants is to be compared with that of their par-
ents.
Tschermac (4) has described the technic of crossing wheat, oats,
rye, and barley. He opened barley flowers for emasculation and arti-
ficial cross-pollination by cutting off the upper one-third to one-half
of the tips of the lemmas and paleas. Pope (2) described a rapid
method for making small grain hybrids. His method was concerned
with the manner of applying pollen to the emasculated barley flowers
and not with the method of opening the barley flowers for emascu-
lation. Woodworth and Bonnett (5) published a photograph showing
the two methods of opening barley flowers that are more fully dis-
cussed in the present article.
In the present paper a description will be given of two methods of
opening barley flowers for emasculation and cross-pollination and
data showing the effect of the two methods upon seed setting and seed
size will also be presented. In addition, data will be given showing
the effect of mutilating barley flowers in different ways upon the aver-
age seed weight.

METHODS OF EMASCULATION

Barley heads were prepared for emasculation in the usual way. In
Fig. 1 the various manipulations in preparing a barley head for
emasculaton are shown. When the awns extend 3 to 4 centimeters
above the last blade (Fig. 1, A), the head is removed from the boot
(Fig. 1, B and C). The base and tip spikelets are cut off with sharp-
pointed scissors, leaving a number of spikelets in the middle of the
head, and the side spikelets are also pulled or cut off (Fig. 1, D).
The barley head is now ready for emasculation (Fig. 1, E).

Two methods of opening barley flowers were used. Both methods
are shown in Fig. 1, F, and in Fig. 1, G, the latter figure being an en-