PRODUCTION of seed from artificially cross-pol-
linated flowers of red clover is attended by a number
of difficulties. Attacks by insects and disease, and the
effects of unfavorable weather conditions, often cause
loss of seeds. Manipulation of the small florets is a
tedious process under field conditions, and fatigue
resulting from the required continuous close applica-
tion tends to reduce the efficiency of the pollinator.
Making the pollinations in the greenhouse is less diffi-
cult and provides better control of environmental
factors, but even here accumulation of pollen and its
transfer between plants is time consuming when the
plants are scattered in the greenhouse. Space limita-
tions often restrict the scope of greenhouse breeding
work.

It was thought that a method whereby red clover
could successfully be crossed in the laboratory would
help to obviate these difficulties. Burton, working with
Pensacola Bahia grass, has reported successful pollina-
tion and seed maturation on detached rootèd culms
placed in water and has also reported that Keller has
shown that a number of other grasses will respond in
this manner. Attempts by the writer to use a similar
method with red clover, as well as with alsike clover and
alfalfa, were not satisfactory. The red clover seeds made
sufficient development, however, to encourage further
experimentation.

Yarwood reported that excised red clover leaves had
remained living for periods up to 17 weeks when floated
on 10% sucrose solution. He further indicated that 2%
sucrose solution served as a satisfactory medium for
keeping the leaves alive, but that certain pathogens
failed to produce fruiting bodies when inoculated onto
such leaves. Since elimination or reduction of patho-
gene activity is important in seed production, 2% sucrose
was selected as the culture medium.

Materials and Methods

Stems bearing freshly-opened flowers were gathered from
plants growing in the field. The stems were severed just above
the crown, and the cut ends were immediately immersed in a bucket
of water. They were then removed to the laboratory, any wither-
ed lower leaves were removed, and about three-fourths of an
inch of the cut end was charred in a Bunson flame. Preliminary
trials indicated that such charring was helpful in prevent-
ing plugging of the conducting tissues.

The stems were placed in a glass container about 500 cc of 2% sucrose solution, made up
and distilled water. All wilted or unopened florets and the remaining ones were pollinated by transfer-
w ith a toothpick. No attempt was made to emasculate the florets. The jars were placed on a table in a
laboratory. The only further care accorded the plants consisted
of occasionally snipping off withered leaves or freshly opened
heads, since pollination of such late-appearing flowers was	im-
able and generally unsatisfactory seed yields.

Results

All plant parts remained fresh and vigorous for 17 days. At the end of this time some of the
flowers turned brown, but young flower and leaf buds were still developing. Additional flower
buds appeared throughout the first 7 to 10 days. The plants matured throughout the same period required by comparable seeds
in the field by hand-pollination of flowers on stems of the same plants. The seeds were plump and appeared superior in quality.