Each of the three monoploid plants was pollinated with pollen from the inbred from which it originated. A few seeds have developed in diploid sectors on ears of each of the monoploid plants.

The development of a number of seeds in the ear of each monoploid plant is evidence that considerable diploidization occurred during the ontogeny of these plants. There should have been some diploid sectors\(^4\) in the tassels. Frequent examinations were made for anthers and none were found. This may be considered as limited evidence that these plants are male sterile.

During the winter of 1961 an attempt will be made to grow progeny from the seed of the three additional lines and observe them for male sterility. Seed supply will be increased by pollinating the silks on these plants with pollen from the original inbred parent.

The limited evidence indicates that each of the paternal monoploids developed from a sperm nucleus. Presumably the sperm nucleus failed to unite with the egg nucleus but acquired the cytoplasm of the egg nucleus. The sperm nucleus with the acquired cytoplasm containing the male sterility plasmagens formed the initial embryonic cell which developed into a monoploid sporophyte.

A converted male-sterile inbred will have the same frequency of homozygous loci in the progeny from the paternal monoploid parent and the inbred from which the monoploid plant was derived that existed in the original inbred line. The method provides relatively pure-breeding male-sterile lines in two generations; i.e., one for making the cross of the inbred on the male-sterile marker and a second for screening the monoploid plants and pollinating them for the initial generation of diploid male-sterile seed of the pure inbred. A third generation will be required to get some increase in seed supply.

The most serious limitation to the practical use of this method for conversion of inbred lines to male sterility is the very low frequency of paternal monoploids. Unless suitable genetic stocks are found which produce a high frequency of paternal monoploids or some means of artificially initiating androgenesis is discovered the method will be of limited interest.

---

### Table 1—Pollen mother cells at anaphase I of univalents.

<table>
<thead>
<tr>
<th>Slide No.</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slide No. 1</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>11</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>Slide No. 2</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>18</td>
<td>27</td>
<td>28</td>
</tr>
</tbody>
</table>

from twin embryos, many were diploid or triploid. In the cereals, triploid oat was reported by Muntzing\(^4\) and Yamazaki \(^5\), \(2n=63\), by Muntzing\(^4\).

In the course of oat investigations in the greenhouse, one and two instances of twin embryos were found in the oat varieties Cherokee and Clintland, respectively. Twin seedlings of Clintland were repotted in 6-inch pots 4 weeks after germination and their root systems were well-developed. In the case of the twin seedlings in Cherokee, their twin embryos became apparent about 7 weeks after planting. They too were separated and repotted in 6-inch pots.

Root tip squashes showed that the twin embryo of the Clintland, both approximately of the normal complement of 42 chromosomes, was obtained from Cherokee was diploid or triploid \(2n=63\).

The triploid plant, a single culm, (10 inches) as its diploid twin at separation and repotting, the triploid plant, which made excellent growth. The 6 clonal propagates to induce further growth of the clonal propagates equalled the diploid height (30 inches). Leaves and stems stomata larger in the triploid than in the diploid.

The anthers of the triploid plant completely, but the quantity of pollen appeared adequate for self- and cross-pollination. Pollen stained with I-KI solution fell into size classes and 51-55 micra in diameter. Fully developed of both size-groups constituted 38% and 56% counted on 2 different dates. Only five seeds were harvested from unbagged panicles. One shrivelled \(F_1\) seed was obtained. The Clintland variety. The low fertility of the triploid plant, with the rather good fertility of a triploid, Muntzing\(^4\).

Chromosome configurations in metaphase I, were observed to ascertain. Trivalents, bivalents, and univalents were observed in many cells, but an accurate number of each kind of association was not possible. Among the anthers of triploid plants, univalents divided equationally in anaphase I cells had univalents on the metaphase plate, the other 46 chromosomes from the triploid plant made good growth. The 6 tillers were split into 3 clonal propagates equalled the diploid t-win plant in height (30 inches). Leaves and stems stomata larger in the triploid than in the diploid.

---

### A 63-CHROMOSOME CHEROKEE OAT PLANT

K. Sadanaga

POLYEMBRYONY, although occurring in very low frequencies, has been one of the sources of obtaining heteroploid plants.\(^3, 4, 5, 6\) It was reported that kernels with twin embryos occurred more frequently than kernels with triplicate or quadruplicate embryos. Among plants arising from twin embryos, many were diploid or triploid. In the cereals, triploid oat was reported by Muntzing\(^4\) and Yamazaki \(^5\), \(2n=63\), by Muntzing\(^4\).

In the course of oat investigations in the greenhouse, one and two instances of twin embryos were found in the oat varieties Cherokee and Clintland, respectively. Twin seedlings of Clintland were repotted in 6-inch pots 4 weeks after germination and their root systems were well-developed. In the case of the twin seedlings in Cherokee, their twin embryos became apparent about 7 weeks after planting. They too were separated and repotted in 6-inch pots.

Root tip squashes showed that the twin embryo of the Clintland, both approximately of the normal complement of 42 chromosomes, was obtained from Cherokee was diploid or triploid \(2n=63\).

The triploid plant, a single culm, (10 inches) as its diploid twin at separation and repotting, the triploid plant, which made excellent growth. The 6 clonal propagates to induce further growth of the clonal propagates equalled the diploid height (30 inches). Leaves and stems stomata larger in the triploid than in the diploid.

The anthers of the triploid plant completely, but the quantity of pollen appeared adequate for self- and cross-pollination. Pollen stained with I-KI solution fell into size classes and 51-55 micra in diameter. Fully developed of both size-groups constituted 38% and 56% counted on 2 different dates. Only five seeds were harvested from unbagged panicles. One shrivelled \(F_1\) seed was obtained. The Clintland variety. The low fertility of the triploid plant, with the rather good fertility of a triploid, Muntzing\(^4\).

Chromosome configurations in metaphase I, were observed to ascertain. Trivalents, bivalents, and univalents were observed in many cells, but an accurate number of each kind of association was not possible. Among the anthers of triploid plants, univalents divided equationally in anaphase I cells had univalents on the metaphase plate, the other 46 chromosomes from the triploid plant made good growth. The 6 tillers were split into 3 clonal propagates equalled the diploid t-win plant in height (30 inches). Leaves and stems stomata larger in the triploid than in the diploid.