

## *Short Communication*

### A COMPARISON OF FOUR MEDIA FOR THE PRODUCTION OF TUBERS FROM LEAF-BUD CUTTINGS IN THE GREENHOUSE

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Lauer (1) has experimented with the use of leaf-bud cuttings to produce small tubers under disease-free conditions in the greenhouse. He described the procedure as fast, simple, and very useful for the rapid increase of selected stocks, especially in the early stages of developing a new cultivar.

The authors noted that although Lauer's program was successful for several cultivars, he used only one medium, sand, for the production of his tubers and it was suggested that other media might give better results, in terms of both size and number of tubers.

The media chosen for study were vermiculite, perlite, and turface, with sterilized sand as a check. Three early cultivars, Conestoga, Simcoe, and Yukon Gold were used together with three maincrop, Kennebec, Shepody, and Belleisle, for possible interaction with the media.

Following treatment with ethylene to break dormancy, the mother tubers were planted in the greenhouse in 30 cm plastic pots in the 1 soil:1 peat moss:1 perlite mixture used by Lauer (1). The early cv. were planted in mid-November, with leaf-bud cuttings made in mid-January; the maincrop cv. were planted in late December (because of a delay in availability) and cuttings taken in mid-March. An average of 50 cuttings was obtained per plant and these were "planted" at the rate of approximately 250/m<sup>2</sup> in flats containing the various media. No nutrients were added and the flats were kept in a mist-bed under low light and an 11-12 hr daylength. Daytime temperature was 20°C with 18°C at night.

The early cv. were harvested in March after about six weeks in the flats and the late ones in just over four weeks. At harvest ca. 75 percent of the leaves were dead in each of the early cv.; the Belleisle and Kennebec were all dead but the Shepody leaves were mostly quite green. All cuttings of all cv. produced tubers except those of Shepody, of which only 50-60 percent showed complete tuber development. The remaining Shepody produced only vegetative axillary shoots, or initiated tubers which then developed into vegetative shoots. Many Shepody also had considerable callus on the stem and the occasional one produced roots.

The distribution of the tubers by weight is given in Table 1. As tubers weighing less than 0.9 gm have been found to be unsatisfactory for field

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TABLE 1. — *Percentages of leaf-cutting tubers in eight categories by weight in grams.*

| Wt. in gm.        | <0.9 | 0.9*-1.9 | 2.0-2.9 | 3.0-3.9 | 4.0-4.9 | 5.0-5.9 | 6.0-6.9 | >7.0 | Usable tubers (>0.9 gm) |
|-------------------|------|----------|---------|---------|---------|---------|---------|------|-------------------------|
| <b>Conestoga</b>  |      |          |         |         |         |         |         |      |                         |
| sand              | 14.6 | 58.4     | 25.0    | 2.0     | —       | —       | —       | —    | 85.4                    |
| vermiculite       | 17.9 | 46.4     | 26.8    | 5.3     | 3.6     | —       | —       | —    | 82.1                    |
| perlite           | 22.2 | 44.5     | 14.8    | 14.8    | 3.7     | —       | —       | —    | 77.8                    |
| turface           | 20.0 | 57.2     | 17.1    | 5.7     | —       | —       | —       | —    | 80.0                    |
| <b>Simcoe</b>     |      |          |         |         |         |         |         |      |                         |
| sand              | 13.4 | 23.1     | 34.6    | 23.1    | 5.8     | —       | —       | —    | 86.6                    |
| vermiculite       | 7.4  | 51.8     | 25.9    | 7.4     | 3.7     | 1.9     | 1.9     | —    | 92.6                    |
| perlite           | 4.0  | 60.0     | 20.0    | 12.0    | —       | 4.0     | —       | —    | 96.0                    |
| turface           | 21.7 | 69.6     | 8.7     | —       | —       | —       | —       | —    | 78.3                    |
| <b>Yukon Gold</b> |      |          |         |         |         |         |         |      |                         |
| sand              | 5.5  | 16.4     | 29.1    | 27.3    | 12.7    | 3.6     | 1.8     | 3.6  | 94.5                    |
| vermiculite       | 3.8  | 42.4     | 32.7    | 11.5    | 5.8     | 1.9     | 1.9     | —    | 96.2                    |
| perlite           | 22.2 | 27.7     | 25.0    | 13.9    | 5.6     | 5.6     | —       | —    | 77.8                    |
| turface           | 9.7  | 38.8     | 25.8    | 16.1    | 3.2     | 6.4     | —       | —    | 90.3                    |
| <b>Kennebec</b>   |      |          |         |         |         |         |         |      |                         |
| sand              | 4.6  | 27.3     | 36.4    | 13.6    | 4.6     | 13.6    | —       | —    | 95.4                    |
| vermiculite       | 30.0 | 35.0     | 30.0    | 5.0     | —       | —       | —       | —    | 70.0                    |
| perlite           | 31.6 | 47.4     | 15.8    | 5.2     | —       | —       | —       | —    | 68.4                    |
| turface           | 23.5 | 47.1     | 11.8    | 17.6    | —       | —       | —       | —    | 76.5                    |
| <b>Belleisle</b>  |      |          |         |         |         |         |         |      |                         |
| sand              | 15.8 | 36.8     | 42.1    | 5.3     | —       | —       | —       | —    | 84.2                    |
| vermiculite       | 21.0 | 42.1     | 15.8    | 5.3     | 15.8    | —       | —       | —    | 79.0                    |
| perlite           | 13.6 | 36.4     | 31.8    | 18.2    | —       | —       | —       | —    | 86.4                    |
| turface           | 10.0 | 80.0     | 10.0    | —       | —       | —       | —       | —    | 90.0                    |
| <b>Shepody</b>    |      |          |         |         |         |         |         |      |                         |
| sand              | 33.3 | 55.6     | 11.1    | —       | —       | —       | —       | —    | 66.7                    |
| vermiculite       | 54.6 | 45.4     | —       | —       | —       | —       | —       | —    | 45.4                    |
| perlite           | 80.0 | 10.0     | 10.0    | —       | —       | —       | —       | —    | 20.0                    |
| turface           | 50.0 | 40.0     | 10.0    | —       | —       | —       | —       | —    | 50.0                    |

\*minimum weight acceptable.

planting, the final column shows the usable percentage from each treatment. From this, it can be seen that clean, sterilized sand is perfectly acceptable as a "growing" medium because it is much cheaper.

The leaf-bud propagation technique also works as well for several recently-released Canadian cv. as it does for Kennebec, but Shepody and possibly other cv. need further investigation before routine propagation is possible by this method.

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### **Literature Cited**

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