Potato variety trial

James P. Fallon

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DELAWARE has been the only variety of Potato grown commercially in Western Australia. This is due to the fact that in the past an early maturing variety with a short dormancy period has been required to suit both hill plantings and swamp crops. However, with the advent of sprinkler irrigation and hence better control of moisture and growing conditions, the need for early maturing varieties has ceased to exist in some districts. There has been consequently an increasing interest in testing varieties which have proved high yielding and of good quality in other parts of the world.

Over the years a large number of varieties have been tested by the Department of Agriculture in the potato growing areas throughout our South-West. As a result of some of the more recent trials, two varieties namely Sebago and Kennebec have been selected as showing promise for commercial use, particularly for the karri slopes in the Manjimup and Pemberton districts where sprinkler irrigation is used. These varieties are widely grown in the Eastern States and the United States of America, where they are regarded as high yielding, good quality varieties.

Some growers may ask why should we look for a variety other than Delaware for Manjimup and Pemberton. Each year, growers in these areas produce high yielding crops of Delaware potatoes. However, due to the tendency for the Delaware variety to form knobby and misshapen tubers the yield of saleable potatoes is not always as high as desired. Losses of up to 30% due solely to second growth are not uncommon. This, and the fact that Delaware is more susceptible to Early Blight than some other varieties has prompted the testing of other varieties for their suitabili-
ity for these districts. Two trials carried out in the Manjimup area in the last year are reported in this article, together with comments on the characteristics of the varieties.

Both trials were carried out on the property of Mr. C. V. Horne of Middlesex, Manjimup. The first was planted in October, 1959. Approximately $\frac{1}{4}$ acre of each of the varieties Delaware, Sebago and Kennebec was planted. Six rows 15 chains long of each variety were planted as a block, fertiliser used was 25 cwt./acre potato manure. Width between plants was 10 in. and rows were 34 in. apart. The reason for planting in $\frac{1}{4}$ acre blocks of each variety rather than in smaller randomised plots was due to the fact that in previous trials where plots had been randomised, varying susceptibility to Early Blight and different lengths of growing season caused some varieties to go down prematurely. However, in order that the trial could still be analysed statistically, each row was harvested independently and weights before and after grading recorded.

During growth the crop was irrigated and received a watering approximately once a week when rainfall was inadequate. Each irrigation was equivalent to 1-1½ in. of water. The crop was sprayed against potato moth and Early Blight after each irrigation. Average yields per acre for each variety are shown in the attached tabulation. Statistical analysis of the results indicated that Kennebec and Sebago gave significantly greater first grade yields than Delaware. There was no significant difference in first grade yields of Sebago and Kennebec.

**Trial 1—August Planting.**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield/acre</th>
<th>% Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grade I</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>tons cwts.</td>
<td>tons cwts.</td>
</tr>
<tr>
<td>Sebago</td>
<td>14 6</td>
<td>17 5</td>
</tr>
<tr>
<td>Kennebec</td>
<td>14 14</td>
<td>16 4</td>
</tr>
<tr>
<td>Delaware</td>
<td>11 19</td>
<td>15 7</td>
</tr>
</tbody>
</table>

On grading the potatoes the following observations were made. Delaware gave a good sample without much second growth. However, it is considered that a better sample would have been obtained had the planting been at 12 in. instead of 10 in. Kennebec produced a coarse sample, and it was obvious that the planting distance with this variety would need to be much reduced. Many tubers which made up the Grade I sample in this variety were so big as to be unsightly and unfit for general use.
In some rows 50% of the tubers were grossly oversize. However, as there is no limit to size in present grading regulations, these tubers were classified as Grade I. A considerable amount of greening in the variety was also noted.

Sebago gave the most satisfactory sample throughout. As could be seen from the figures, a high percentage of uniformly well shaped and good sized Grade I tubers was obtained.

In a subsequent trial carried out in the summer planting, the same three varieties were compared. In this case, 8 rows of each of the varieties were planted in a ¼ acre block, each row again being approximately 15 chains long. The same planting distances were used as previously. Potato manure was applied at the rate of 25 cwt./acre and cultural practices were carried out as in commercial production. During the growing period, it was noticed that germination in the Sebago crop was not as good as in other varieties. Rhizoctonia was also severe and seriously affected the trial. Results in average yields per acre and percentage of Grade I tubers are shown tabulated hereunder. Analysis of the results indicate that while Kennebec out yielded both the Delaware and Sebago variety in this particular trial, there was no significant difference between Sebago and Delaware.

**Trial 2—December Planting.**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Yield/acre</th>
<th>Yield/acre</th>
<th>% Grade</th>
<th>Grade I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tons</td>
<td>cwts.</td>
<td></td>
<td>tons</td>
<td>cwts.</td>
</tr>
<tr>
<td>Sebago</td>
<td>10</td>
<td>3</td>
<td>16</td>
<td>70.2</td>
<td></td>
</tr>
<tr>
<td>Kennebec</td>
<td>15</td>
<td>19</td>
<td>12</td>
<td>90.7</td>
<td></td>
</tr>
<tr>
<td>Delaware</td>
<td>10</td>
<td>17</td>
<td>5</td>
<td>66.8</td>
<td></td>
</tr>
</tbody>
</table>

Although it is not unusual in the Manjimup and Pemberton districts to find Delaware crops with a high percentage of second grade tubers, it is most unusual to find a high percentage of second grade Sebago. Although no second growth was noticed in Sebago, a considerable amount of cracking and stem end rot was evident, and this greatly reduced the yield of Grade I tubers of this variety in the trial. The following comments are made as a result of experience to date with each of these varieties:

**Kennebec.**

This variety matured approximately one week earlier than Delaware. The tubers are characterised by being large, elliptical to oblong, medium thickness with shallow eyes. They have a smooth skin which is creamy to buff, and are white fleshed.

**Sebago.**

Maturity of this variety was 2 to 3 weeks later than Delaware. Tubers were inclined to be large, elliptical to round, medium in thickness with smooth skin, shallow eyes and white flesh. This variety has good resistance to Early Blight and drought, is not subject to second growth and is high yielding. It has been
demonstrated that Sebago is no more susceptible to hollow heart than Delaware when grown under the recommended spacing conditions. The variety is inclined to set only a few tubers per plant particularly when cut seed is used and hence spacing of the variety should be close in the row to prevent oversize tubers being formed. It is advisable to plant where possible, large size cut setts or round seed. Where cut seed is used for planting Sebago summer crops, care must be taken to ensure that the setts are either planted immediately into cool ground or are very carefully callused if a satisfactory germination is to be obtained. The tubers are most attractive in appearance and have an extremely short dormancy period. Where this variety must be stored for long periods for ware purposes during warm conditions, the use of a sprout inhibitor would be advantageous.

Delaware

Delaware has been the only commercial variety grown in the State for approximately 50 years despite the testing of other varieties. It is a medium late variety with elliptical to oblong tubers of medium thickness. The skin is smooth and of creamy buff colour. Eyes are medium to deep pitted, and the same colour as the skin. Tuber flesh is white. This variety is susceptible to Early Blight and second growth. Although generally a high yielding variety, percentage of first grade tubers is at times disappointing. Nevertheless, this variety has proved adaptable to a wide range of growing conditions in the State.

Summary and Recommendations.

The trials indicate that under the conditions at Manjimup, the varieties Sebago and Kennebec are likely to yield as well as or to outyield the Delaware variety normally grown. This and the fact that each possesses other desirable characteristics should ensure that they will find a place in W.A. potato growing.

Growers are urged however, to be extremely careful when growing for the first time a variety with which they are unfamiliar. Every effort should be made to become well informed on the characteristics of the variety which it is intended to plant and to adjust growing techniques to suit the peculiarities of that variety. For instance, these trials reported on here have clearly indicated that each of the three varieties tested has specific yet different requirements for spacing within the row if an even line of tubers is to be obtained. Finally, when obtaining seed of a new variety for testing purposes growers should make certain that the variety they get is true to name. Many instances could be cited of growers obtaining unsatisfactory results with a certain variety which subsequent tests have shown to be incorrectly named.

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