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Tincurrin—a new biscuit wheat

An experimental plot of Tincurrin wheat showing the distinguishing clubbed head

By J. T. Reeves, H. M. Fisher and G. B. Crosbie, Plant Production Division

Although a demand has existed both locally and overseas for soft wheat suitable for biscuits, cakes and various confectioneries, production has been very limited. Investigations of overseas prospects have indicated however, the possibility of substantial markets for soft wheat and a preference for qualities provided by soft clubhead varieties.

Jones, Parish and Moss (1972) concluded that the variety Gluclub when grown in the southern, lower protein areas of Western Australia was very suitable and they recorded the early efforts to establish an export grade based on this variety. Despite the low yield of Gluclub the efforts of a group of dedicated growers ensured the production of sufficient grain for limited overseas evaluation. With the appearance of the high yielding variety Egret, the industry was placed on a better economic footing and production has increased.

In 1978 farmers in the soft wheat area will be able to grow the higher yielding variety Tincurrin.

Breeding

Tincurrin was developed from a cross between Gluclub and a high yielding crossbred produced at the Avondale Research Station. The pedigree of the crossbred parent is Chile 1B//Insignia/Falcon. The final cross was made in a Department of Agriculture glasshouse at South Perth in 1970. The early generations were then grown in the glasshouse by the single seed descent method. This consists of harvesting only one grain from each plant for sowing the next generation. The cross was then planted at Wongan Hills Research Station for field selection in 1971. Small scale yield and quality tests commenced two years later. From the start the selection 70W10-19, subsequently named Tincurrin, proved outstanding for both yield and biscuit quality.

Description

Tincurrin is a short-medium height variety about equal to Egret in plant height, but five days earlier flowering (slightly later than Gamenya). The head is brown, clubbed, erect and bearded. The presence of awns (beards) enables it to be readily distinguished from Gluclub. Tincurrin is normally strong strawed and the heads are non-shedding. The grain is soft, white and starchy.

Yield

Following its excellent showing in the initial small scale yield trials in 1973 and 1974 full scale tests in 31 trials throughout the soft wheat areas east and west of the Great Southern railway in 1975 and 1976
The trials were sown mainly on farmers properties on clover ley land with normal cultural and fertiliser treatment and provided direct comparisons of the varieties over a range of sowing times and other conditions. Most trials were sown in the period from late May to early June, but sowing dates ranged from May 18 to July 1.

Superiority of Tincurrin over Egret increased in the drier areas (see Map), with later sowing and on the poorer soils. It still outyielded Egret, however, in the higher rainfall areas and present data indicate that best results may be obtained in the more southerly areas provided rust is not a problem. It has not yielded particularly well so far in multiple cropping situations and this is possibly associated with increased exposure to septoria in this situation.

It is estimated that potential production of wheat of all types in the soft wheat area is in the order of 500 000 tonnes. Assuming Tincurrin eventually replaces existing varieties over two-thirds of the area the likely increase in production is estimated at 30 000 tonnes worth $3 million annually to growers in the area.

Quality
Initial quality tests in 1973 showed many of the lines from the cross 70W10 had promising quality. Subsequently, detailed quality tests were carried out in 1974, when Tincurrin was recognised to be the

confirmed Tincurrin’s exceptional yield compared with other major varieties in the area. Overall yield was 9 per cent better than the currently recommended soft wheat variety, Egret, and 19 per cent better than Gamunya, the main ASW (Australian Standard White) wheat for most of the area. The potential impact of the new variety on soft wheat production is best appreciated when it is considered that yield is nearly 40 per cent above Gluclub, the variety on which soft wheat production was originally based in W.A.

<table>
<thead>
<tr>
<th>Variety and Year</th>
<th>Hectolitre weight (kg)</th>
<th>Wheat protein (%)</th>
<th>Flour yield (%)</th>
<th>Farinograph (water absorption %)</th>
<th>Extensograph</th>
<th>Cookie spread ratio***</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>maximum resistance (B.U.)*</td>
<td>Extension (cm)**</td>
</tr>
<tr>
<td>1975 Egret</td>
<td>80.9</td>
<td>9.2</td>
<td>66.8</td>
<td>52.7</td>
<td>261</td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>78.9</td>
<td>9.9</td>
<td>68.6</td>
<td>51.8</td>
<td>143</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td>80.0</td>
<td>8.7</td>
<td>67.0</td>
<td>51.5</td>
<td>155</td>
<td>17.6</td>
</tr>
<tr>
<td>1976 Egret</td>
<td>81.0</td>
<td>9.2</td>
<td>69.1</td>
<td>52.4</td>
<td>236</td>
<td>17.7</td>
</tr>
<tr>
<td></td>
<td>80.5</td>
<td>9.9</td>
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<td>52.4</td>
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<td>20.2</td>
</tr>
<tr>
<td></td>
<td>80.1</td>
<td>8.6</td>
<td>68.7</td>
<td>51.3</td>
<td>162</td>
<td>18.4</td>
</tr>
</tbody>
</table>

* The maximum resistance (in Brabender units) exhibited by a piece of dough when stretched on an extensograph.
** Extension is the distance in centimetres, over which a dough piece is stretched on an extensograph.
*** Cookie spread ratio—the ratio of cookie diameter to thickness. 1975 and 1976 data cannot be compared due to a difference in the method of analysis.
outstanding selection from the cross. More recent tests have confirmed its excellent overall biscuit wheat qualities.

Tincurrin is a soft wheat with good milling characteristics. Flour from Tincurrin has a very low water absorption capacity and very weak dough properties. These particular quality characteristics which make it an ideal biscuit wheat also make it a poor quality wheat for the ASW grade. Lower average protein levels have been encountered in trial samples of Tincurrin associated with the overall higher yield. Average quality data are shown in the Table. Tincurrin lacks the versatility of ASW type wheats which have application for many end-uses such as Japanese noodles and various types of leavened and unleavened bread. The presence of even limited amounts of Tincurrin, could have an adverse effect on the quality characteristics and marketability of ASW wheat. For this reason it is essential that production be confined to the area where arrangements have been made for the separate receival of Australian Soft (W.A.) Wheat.

Segregation essential
Tincurrin is intended for delivery only to bins receiving Australian Soft (W.A.) Wheat within the soft wheat area, that is, the area south and west of a line joining Brookton, Corrigin, Lake Grace, Ongerup and Albany (see figure). Special receival facilities are already provided by CBH at a number of sidings in this area and it is expected that receival points for soft wheat will increase in accordance with production.

Soft wheat growers are not compelled to deliver present soft wheat varieties to the grade. They should be fully aware however, that mixing soft wheats with other grades can result in serious deterioration in quality for bread making and downgrading on overseas markets. It will be largely a matter for wheat growers themselves and the AWB whether some form of controlled segregation will be necessary eventually to ensure that such mixing is prevented. Several distinctive characteristics of Tincurrin including head colour and shape, awnedness and specific reaction of the grain to a number of laboratory tests would facilitate such segregation.

Disease reaction
Tincurrin is susceptible to both stem rust, *Puccinia graminis tritici*, and septoria, *Septoria tritici* and *Septoria nodorum*. This could be disadvantageous to farmers growing it in the extreme south of the soft wheat area. Stem rust resistance is being added by backcrossing and it is anticipated that a rust resistant strain will become available in a few years. Septoria resistance is more difficult to incorporate.

The variety is susceptible to flag smut, *Urocystis agropyri*, but this disease is not prevalent in Western Australia.

Recommendations
Tincurrin is suitable only for production of Australian Soft (W.A.) Wheat. It is recommended for general sowing to replace all varieties grown at present in the soft wheat areas as defined. While it has been released specifically as a soft wheat to replace the lower yielding varieties Egret and Gluclub it should outyield all other varieties of any type.

Information on the performance of Tincurrin is limited and there may be situations where other varieties may be better. In the rust liable areas south east of Katanning for example, the high potential yield of Tincurrin is partially offset by its susceptibility to stem rust. In seasons when rust is known to have oversummered on growing plants and the risk of spring infection is therefore greater than usual the variety Egret should be sown. Egret has not so far been attacked by the major rust races found in W.A. In situations which favour the development of septoria disease such as very early sowing Egret may be better.

Reference