Registration of ‘AC Stirling’ Safflower

‘AC Stirling’ SAFFLOWER (Carthamus tinctorius L.) (Reg.
no. CV-18, PI 559909), was developed at the Agriculture Can-
da Research Station, Lethbridge, AB. The experimental des-
ignation for AC Stirling was Lesaf 241. Registration no. 3497
was issued for AC Stirling on 20 December 1991, by the Va-
ety Registration Office, Plant Products Division, Food Pro-
duction and Inspection Branch, Agriculture Canada. AC Stirling
is only the second safflower cultivar released in Canada. ‘Sa-
fire’ (1), which was released in 1985, and ‘S-208’, a standard
U.S. variety, were used for comparison.

AC Stirling has yellow flowers, produces plants of medium
height, has spiny bracts and leaves, and is early maturing (Ta-le 1). The oil quality of AC Stirling is very similar to that of
Saffire, with an iodine value of 151.6 and linoleic acid (C
18:2) and oleic acid (C 18:1) concentrations of 83.7 and 8.0%,
respectively.

AC Stirling resulted from modified pedigree selection from
The parental lines TH-5 (thin-hulled) and RH-4 (reduced hull),
both developed at Logan, UT, have genetic reductions in hull
percentage (2). Gila was developed in Arizona and has been
grown continually in the southern USA. Mexican Dwarf is a
dwarf mutant of Indian origin selected from the USDA World
Collection in the 1972-1973 season in Valle del Fuerte, Sin-
aloa, Mexico (3). Single F2 plants were screened in 1983 for
oil, maturity, and achene color. Single-plant selections were
made from F3 and F4 progeny rows. An F4 plant selected in
1985 was planted as an F5 progeny row in 1986 and harvested
in bulk. This F5 bulk was designated as Lesaf 241. Replicated
yield trials were conducted in 1987 at Lethbridge and Vauxhall
in southern Alberta, and also an evaluation for resistance to
sclerotinia head rot caused by Sclerotinia sclerotiorum (Lib.)
de Bary. Lesaf 241 was tested in the Safflower Cooperative
Registration Tests from 1988 to 1990, under both dryland and
irrigated conditions in the southern Prairie provinces of Can-
ada.

AC Stirling outyielded Saffire by an average of 17% and S-
208 by 16%, in 31 station-yr of data (Table 1). In the black
soil zone of southern Saskatchewan and Manitoba (10 station-
yr) AC Stirling produced 2.36 t ha−1 and outyielded Saffire
by 12% and S-208 by 6%. In the brown soil zone of southern
Alberta and southern Saskatchewan (21 station-yr) AC Stirling
produced 2.73 t ha−1 and outyielded Saffire by 20% and S-
208 by 17%.

The oil content of AC Stirling seed (measured by nuclear
magnetic resonance, NMR, on an as-is basis, 7% H2O) aver-
eged 350 g kg−1 and ranged from 303 to 394 g kg−1 of oil.
In the same trials, the oil content of Saffire averaged 323 g
kg−1 and ranged from 289 to 352 g kg−1 and the oil content
of S-208 averaged 377 g kg−1 and ranged from 294 to 413 g
kg−1. The acceptable oil content and seed size (averaging 0.357
of S-208 averaged 350 g kg−1 and ranged from 294 to 413 g
kg−1. The acceptable oil content and seed size (averaging 0.357

Table 1. Comparison of AC Stirling, Saffire, and
S-208 under Canadian prairie conditions

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>AC Stirling</th>
<th>Saffire</th>
<th>S-208</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenotypic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flower color</td>
<td>yellow</td>
<td>orange-</td>
<td>yellow-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>orange-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>red+</td>
<td>orange†</td>
</tr>
<tr>
<td>Plant height, cm</td>
<td>58.0</td>
<td>54.8</td>
<td>60.6</td>
</tr>
<tr>
<td>Maturity, d</td>
<td>124.1</td>
<td>121.0</td>
<td>130.0</td>
</tr>
<tr>
<td>Quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil content, g kg−1</td>
<td>350</td>
<td>323</td>
<td>377</td>
</tr>
<tr>
<td>(7% H2O)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linoleic acid</td>
<td>83.7</td>
<td>83.5</td>
<td>(82.0)§</td>
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<tr>
<td>(C18:2)</td>
<td></td>
<td></td>
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<tr>
<td>Oleic acid</td>
<td>8.0</td>
<td>8.5</td>
<td>(9.5)§</td>
</tr>
<tr>
<td>(C18:1)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Iodine value</td>
<td>151.6</td>
<td>151.7</td>
<td>—</td>
</tr>
<tr>
<td>Achene color</td>
<td>white</td>
<td>white</td>
<td>white</td>
</tr>
<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mean, t ha−1</td>
<td>2.61</td>
<td>2.23</td>
<td>2.24</td>
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<tr>
<td>Black soil zone, t ha−1</td>
<td>2.36</td>
<td>2.10</td>
<td>2.22</td>
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<tr>
<td>Brown soil zone, t ha−1</td>
<td>2.73</td>
<td>2.28</td>
<td>2.31</td>
</tr>
</tbody>
</table>

† Calculated using all entries (16 to 20) in the respec-
tive zone.
‡ Full bloom-postbloom flower color.
§ Extrapolated from previous 12 station-yr compari-
sons.

thami Corda). Shattering resistance of AC Stirling is bet-
ter than that of Saffire.

Breeder seed was derived from 20 F5 single
plants grown in 1990. These single-plant derivatives
after harvest in 1991. Breeder seed is main-
tained by the Agriculture Canada Experimental Farm, Indian
head, SK, SOG 2K0 Canada. Distribution of pedigreed seed
through SeCan Association, 200-57 Auriga Drive, Nepean,
ON, K2E 8B2 Canada.

H.-H. MÜNDEL,* R. J. MORRISON

References and Notes
1. Mündel, H.-H., H.C. Huang, L.D. Burch, and E.
Registration of Safflower. Crop Sci. 27:364.
3. O'Ferrall, S. 1975. Nueva la fase de cartón con
un pH y probabilidad. Aegri. Taz. Mex. 3: