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Grain crop varieties for Western Australia

H M. Fisher

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Recommendations for grain crop varieties grown in Western Australia are based on the results of field trials carried out each year by the Department of Agriculture at some 50 sites throughout the agricultural areas.

New varieties are tested directly against existing commercial varieties in large scale field trials for several years. Yield and quality results are analysed and market requirements are studied before recommendations are formulated.

Proposals for recommendations and the release of new wheat varieties are submitted to the State Wheat Advisory Committee. Proposals for grains other than wheat are submitted to the State Coarse Grains and Seeds Advisory Committee.

These Committees, which include grower, marketing and grain handling representatives, examine the proposals before final recommendations are released.

This article gives information on the varieties of a range of crops now recommended for growing in Western Australia.

WHEAT VARIETIES

GAMENYA

Gamenya is a versatile wheat which yields well under most conditions and is grown on at least 60 per cent of the total wheat area. It is recommended for production of Australian Standard White (W.A.) grade wheat in most of the medium and low rainfall areas, but not in the south coastal rust liable area and the soft wheat area. It produces grain of excellent quality for the ASW grade.

Gamenya is susceptible to rust and should not be grown at all in the rust liable southern areas (generally south and east of a line from Albany-Katanning-Pingrup-Mt. Madden-Kumarl). Rust on susceptible varieties such as Gamenya could lead to build up of new races which could attack resistant varieties such as Madden or Eagle.

In the northern area Gamenya is recommended if little rust is detected in the area in April and the risk of an epidemic is therefore low.

Author Harry Fisher (right), who is responsible for the Department of Agriculture crop variety testing programme, examines variety test results with cereal chemist Graham Crosbie. All results are computerised, allowing rapid processing and comparison of data.
In western high rainfall areas Gamenya is an acceptable alternative to Darkan (West Midlands), Bokal (central high rainfall and west Great Southern—ASW grade), Egret (soft wheat area—medium rain non-rust area).

Gamenya is a short season variety prone to Septoria attack if sown too early. Low hectolitre weight and pinched grain can be problems in this situation. Gamenya should not be sown earlier than mid May in any area. It is suitable for sowing as late as the end of July and in some areas may give acceptable yields with even later sowing, provided weed control is good.

MADDEN
Madden is the major variety recommended for the south coastal rust liable areas (ASW grade) and for the Australian Hard (W.A.) grade on heavy soils in the eastern wheatbelt.

Madden maintains full resistance to all strains of rust in Australia and in south coastal districts outyields all other rust resistant varieties (such as Eagle, Gamut, Kite). If no rust occurs it equals Gamenya in yield on average, but its major advantage is in years when rust would severely reduce yields of susceptible varieties.

Sowing Madden for ASW grade is also an alternative to the soft wheat Egret for late sowing in the rust liable sector of the soft wheat area. However, Egret is so far also rust resistant in W.A. and is higher yielding than Madden with general early sowing.

For the soft wheat area west of the Great Southern, Madden is a suitable rust resistant alternative to Egret and Bokal but is lower yielding than both. It would be no advantage except for ASW grade production in a bad rust year when Bokal would be attacked.

Madden is slightly earlier maturing than Gamenya and is also very prone to septoria disease if sown too early. It is recommended that it be sown no earlier than mid May in any area. The best sowing time is mid May-mid June, but it can give satisfactory results in many southern areas with much later sowings up to the end of July.

A “brown straw” condition appeared on Madden in many areas in 1976. This is known to be associated with Madden’s rust resistant parent and is believed to be non-fungal in origin and of little consequence. Its association with pinched grain and low yield of Madden in 1976 is under investigation.

EGRET
Egret is recommended exclusively for Australian Soft (W.A.) grade production in the low protein, soft wheat area south and west of a line joining Brookton-Corrigin-Lake Grace-Ongerup-Albany. Receival of soft grade is at sidings nominated by Cooperative Bulk Handling Ltd. each year. Otherwise the variety is acceptable at ASW grade sidings in the soft wheat area. Soft grade Egret does not command a premium.

Yield is 15-40 per cent. better than Glucub, depending on area and in the better rainfall areas up to 26 per cent. better than Gamenya and 16 per cent. better than Bokal.

Egret is mainly a biscuit wheat and should not be grown outside the soft wheat area, because large amounts of such wheats would downgrade the quality of higher protein grades in other areas. Apart from this it is unlikely that it would yield well in drier areas.

Egret is resistant to races of rust commonly found in W.A. and is therefore suitable for growing in the rust liable part (Katanning-Pingrup-Albany) of the soft wheat area.

It is susceptible however, to a race of rust prevalent in the Eastern States which was also first recorded in W.A. in 1974. Should this strain build up in W.A. growers would need to consider changing to production of Madden (ASW grade)
or other rust resistant varieties in the rust liable area.

A mid season variety, with good tolerance to septoria leaf spot, Egret is very suitable for early sowing in May, when shorter season varieties are likely to be badly affected by septoria. Yield of Egret falls away fairly rapidly with later sowing compared with shorter season varieties such as Gamenya, Madden and Bokal.

DARKAN
Darkan is a high yielding, short season variety with tolerance to septoria. It often yields well even when apparently heavily infected with septoria leaf spot and glume blotch. It is recommended on this account for ASW grade production in the West Midlands area where it is higher yielding than Gamenya, Falcon, Bokal and other varieties. It is also recommended for very early sowing before mid May in all other areas apart from the rust liable south coastal areas. Darkan is moderately tall growing and is suitable for new land sowing in most areas.

The relatively poor bread making quality of Darkan grain prohibits wider use, but this is not an overriding factor in the restricted situations where it is recommended.

BOKAL
Bokal, a high yielding short season wheat, is recommended for ASW grade production in the central high rainfall area generally west of a line from Bolgart to Brookton. It is also an alternative to soft wheat (Egret) production in the soft wheat area west of the Great Southern line, but yields are likely to be lower than Egret particularly in the lower Great Southern area and with May sowing.

Bokal yields well in the West Midlands area, but has lower hectolitre weight than Gamenya which could present problems of meeting receival standards. Low hectolitre weight also restricts its application in drier areas, but yield is high over a wide range of conditions. Grain is of good baking quality but is slightly harder than Gamenya, and acceptable in the ASW range only in limited amounts.

EAGLE
Eagle is a rust resistant early-mid season variety recommended for the longer season, rust liable, south coastal areas as well as northern areas as a reserve variety providing an alternative source of rust resistance to Madden. Like Madden it is resistant to all strains of rust in Australia. However, it derives its resistance from the grass *Agropyron elongatum* and in the event of a new rust strain developing which could attack Madden it is hoped that Eagle might remain resistant.

GAMUT
Gamut is a rust resistant variety recommended for the drier (mallee) parts of the rust liable southern areas as a reserve variety providing an
RECOMMENDED WHEAT VARIETIES—1977/78
Areas 1 to 7

Low risk of rust:
GAMENYA (Reserves—Madden, Eagle)

High risk of rust:
MADDEN (Reserves—Eagle)

Wheat varieties for 1977/78 (* Recommended)

<table>
<thead>
<tr>
<th>Variety (1)</th>
<th>Origin (2)</th>
<th>Maturity</th>
<th>Quality class</th>
<th>Disease resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flag smut</td>
</tr>
<tr>
<td>Bokal (M. 140)</td>
<td>W.A.-D.A.</td>
<td>Early</td>
<td>ASW</td>
<td>Resistant</td>
</tr>
<tr>
<td>Darkan (M. 129)</td>
<td>W.A.-D.A.</td>
<td>Early</td>
<td>ASW</td>
<td>Resistant</td>
</tr>
<tr>
<td>Eagle (AR Falcon 28A)</td>
<td>N.S.W.-D.A.</td>
<td>Early Mid. S.</td>
<td>Hard</td>
<td>Resistant</td>
</tr>
<tr>
<td>Egret (W.W.36)</td>
<td>N.S.W.-D.A.</td>
<td>Mid.S.</td>
<td>Soft</td>
<td>Resistant</td>
</tr>
<tr>
<td>Falcon</td>
<td>N.S.W.-D.A.</td>
<td>Early Mid. S.</td>
<td>Hard</td>
<td>Resistant</td>
</tr>
<tr>
<td>Gambee (XBVT 157) (Gamena B)</td>
<td>W.A.-P.B.</td>
<td>Early</td>
<td>Hard</td>
<td>Susceptible</td>
</tr>
<tr>
<td>Gamunya</td>
<td>N.S.W.-S.U.</td>
<td>Early</td>
<td>ASW</td>
<td>Resistant</td>
</tr>
<tr>
<td>Gamut (TR 118)</td>
<td>N.S.W.-S.U.</td>
<td>Early</td>
<td>Hard</td>
<td>Resistant</td>
</tr>
<tr>
<td>Kite (Darf) (Dwarf AR Falcon)</td>
<td>N.S.W.-D.A.</td>
<td>Early Mid. S.</td>
<td>Hard</td>
<td>Resistant</td>
</tr>
<tr>
<td>Madden (M 145)</td>
<td>N.S.W.-S.U.</td>
<td>Early</td>
<td>Hard</td>
<td>Susceptible</td>
</tr>
</tbody>
</table>

(1) Former names in brackets.
(2) N.S.W.–D.A. Department of Agriculture, N.S.W.
N.S.W.–S.U. Sydney University, N.S.W.
W.A.–D.A. Department of Agriculture, W.A.
W.A.–P.B. Private breeder, W.A.
alternative source of rust resistance to Madden. Gamut is a short season variety with hard, good quality grain, but yields only 80 per cent. of Madden on average. It is tall growing and may be suitable for new land, but suffers from some shedding.

Other wheat varieties
Many popular varieties are not recommended because they do not yield as well and in many cases produce lower quality grain than recommended varieties. Some low quality varieties could downgrade the quality of W.A. wheat if grown on a wide scale. In a very few cases such varieties may give higher yields than recommended varieties.

Recommended varieties, within the limits indicated, provide farmers with considerable choice. Other varieties which are not recommended because of lower yield, but which have acceptable quality and may be useful to farmers in some areas include:

FALCON: A mid season wheat with hard grain. Suitable for inclusion at present in the hard grade or in the ASW grade in very limited amounts, but the grain is harder than desirable for either grade. It yields best with May sowing on light soils, but is generally below Geminya, Madden and other recommended varieties. It may outyield Madden and Gambee in northern areas, particularly if sown early.

GAMBEE: A short season, hard wheat acceptable at present for the hard grade, but generally lower yielding than Madden except with very late sowing (July). Grain is harder than Madden and less suitable for the hard grade.

KITE: Later maturing and shorter than Eagle, with softer grain and

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**Barley varieties for 1977/78 (* Recommended)**

<table>
<thead>
<tr>
<th>Variety (1)</th>
<th>Origin (2)</th>
<th>Head type</th>
<th>Maturity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beecher</td>
<td>U.S.A.</td>
<td>Six-row</td>
<td>V. early</td>
<td>Feed barley</td>
</tr>
<tr>
<td>* Clipper (W.I.2045/10)</td>
<td>S.A.-W.A.R.I.</td>
<td>Two-row</td>
<td>Early</td>
<td></td>
</tr>
<tr>
<td>Dampier (W45)</td>
<td>W.A.-D.A.</td>
<td>Two-row</td>
<td>Early</td>
<td></td>
</tr>
</tbody>
</table>

(1) Former names in brackets.  (2) S.A.-W.A.R.I.—Waite Agricultural Research Institute S.A.  W.A.-D.A. Dept. of Agriculture, W.A.
slightly lower yield on average. It has the same rust resistance as Eagle and is suitable for growing in rust liable areas as a reserve variety alternative to Eagle.

BARLEY
Barley yields well in all areas but is more popular in southern, higher rainfall areas than in the northern and drier areas. In some districts it competes economically with wheat at present prices.

CLIPPER
A high yielding short season, 2-row barley with good quality grain for malting or feed, Clipper is the recommended variety for all areas for production of 2-row manufacturing and feed grade barley.

It is popular on overseas markets particularly because of its high malt extract, low grain protein content, better overall malting qualities, higher hectolitre weight and freedom from skinning compared with Dampier. It has slightly smaller grain than Dampier and the diastase level is slightly lower but these factors have not detracted from its appeal in overseas trade.

Sievings losses during harvest are not appreciably higher than for Dampier under normal conditions, but may be significantly greater in adverse conditions.

Clipper is resistant to net blotch disease but susceptible to scald. It has also retained resistance to powdery mildew in Western Australia, but this is not expected to persist and some breakdown has already been reported. Powdery mildew is not considered an important cause of yield reduction in barley in this State.

In some windy situations, Clipper suffers varying degrees of head loss associated with collapse of the slender stem 40 to 50 mm below the head (as distinct from “necking” or breaking of the backbone at the base of the ear). The problem is accentuated where the crop is well grown and where rain at maturity is followed by high winds. Reduced straw strength due to fungal and nutritional disorders may contribute to the problem. Clipper is more susceptible than Dampier although both may suffer appreciable yield reduction.

Other barley varieties
DAMPIER: Still acceptable on overseas markets as a manufacturing or feed barley. Lower yields than Clipper is the main reason it is no longer recommended. Results of nearly 300 field trials directly comparing the two varieties since 1969 have shown that Dampier yields an average of 5 to 10 per cent. less than Clipper in practically all areas. The results include a proportion of adverse situations and years in which Clipper yield was reduced and in some cases, was lower than Dampier.

Dampier is preferred for local production of malt for export because of its higher diastase content. Some growers in some areas prefer Dampier for a number of reasons, including lesser itch problems and easier threshing than Clipper.

BEECHER: A 6-row barley grown for feed. It was once popular in Japan but demand has declined in recent years in favour of 2-row types. Beecher yields well in the drier eastern areas, outyielding Clipper and Dampier on average, especially in drier seasons. Present prices are lower than 2-row feed barley.

OATS
Western Australian oats enjoy an excellent reputation on overseas markets. Although good yields are obtained, present prices do not allow the crop to compete economically with wheat or barley in most areas.

WEST
West was released to growers in 1975 and is recommended for all areas. It is a short season, rust resistant oat with good quality grain. The grain has a higher grain percentage and higher protein than Swan, which adds to its appeal on overseas markets. It is also slightly lighter in colour than Swan but is slightly smaller and has a lower hectolitre weight (similar to Avon).

West has slightly shorter straw than Swan. Recent trials indicate that high yields of good quality hay can be expected from West oats, particularly in areas where rust damages susceptible varieties.

OTHER VARIETIES
SWAN: A short season variety with excellent grain quality and is still

<table>
<thead>
<tr>
<th>Oat varieties for 1977/78 (*) Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety (1)</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>Swan (M128)</td>
</tr>
<tr>
<td>* West (XBVT18)</td>
</tr>
</tbody>
</table>

(1) Former names in brackets.
Lupin varieties for 1977/78 (* Recommended)

<table>
<thead>
<tr>
<th>Variety (1)</th>
<th>Origin</th>
<th>Maturity</th>
<th>Flower colour</th>
<th>Seed Colour</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Lupin (L. albus)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Ultra (WB2)</td>
<td>W.A.-Univ.</td>
<td>Mid-early</td>
<td>White</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Narrow Leaved Lupin (L. angustifolius)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Marri (660A1-2)</td>
<td>W.A.-Univ/ D.A.</td>
<td>Late Mid.</td>
<td>White</td>
<td>White</td>
<td>Grey leaf spot resistant</td>
</tr>
<tr>
<td>* Unicrop (WAU-11)</td>
<td>W.A.-Univ.</td>
<td>Early</td>
<td>White</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Uniharvest (WAU-10)</td>
<td>W.A.-Univ.</td>
<td>Late Mid.</td>
<td>White</td>
<td>White</td>
<td></td>
</tr>
</tbody>
</table>

(1) Former names in brackets.

acceptable for export. The main reasons why it is no longer recommended are its lower yields than West in most areas and its susceptibility to rust. In the wetter areas, Swan usually yields as well as West in the absence of rust, but runs the risk of being severely attacked.

**LUPINS**

Lupins are a relatively new grain crop and much remains to be done in developing their potential as an export grain. Lupins are adapted to the wetter areas, particularly northern high and medium rainfall areas (more than 350 mm). In drier areas, they should be grown only on light soils and sown very early.

**UNICROP**

A short season, non shedding, sweet-seeded variety of narrow leafed lupin (L. angustifolius), Unicrop is recommended for all areas. The variety has attractive white, high protein seeds and has been favourably received on overseas markets. It is susceptible to most lupin diseases including grey leaf spot. In some situations, shortness of the main stem may cause some difficulty in harvesting.

**MARRI**

A mid-season, non shedding, sweet-seeded variety of narrow leafed lupin (L. angustifolius). Marri is noted for resistance to grey leaf spot disease. It is recommended particularly where grey leaf spot is a problem and generally for the poorer sandy soils in northern areas, particularly potassium deficient soils, where it has yielded better than Unicrop. The recommendation applies to the northern and north central high rainfall areas (more than 450 mm) including the West Midlands area, and the northern medium rainfall area (350-450 mm rainfall).

Marri is a taller variety than Unicrop and is useful on new land or in other situations where the shortness of Unicrop presents harvesting difficulties. It outyields Uniharvest in northern areas in most situations.

Marri is not recommended for southern areas, where yield is generally lower than Unicrop and Uniharvest and lodging may be a problem.

**ULTRA**

Ultra is a short season, non shedding, sweet-seeded variety of white lupin (L. albus) with large white seeds noted for high protein content (up to 40 per cent.). It is adapted to the more loamy soils and is recommended for the red brown loams of the Chapman Valley and adjoining areas where it has outyielded Unicrop.

**FIELD PEAS**

Field peas are grown on a small scale, mainly for stock feed and farm use. The main variety recommended is the brown-seeded, short season Derrimut which outyields other varieties in Western Australia. Buckley is the main white-seeded variety recommended, but for later sowing in dry areas, White Brunswick is also recommended.

A useful alternative variety for wetter areas is the brown-seeded Dun.

**LINSEED**

Although market prospects are variable, linseed can be a successful crop for south coastal areas and yields well over a wide area, provided weeds and insects are controlled.

Glenelg is the recommended variety, yielding about 10 per cent. more than the next best alternative, Kameniza.

Field pea varieties for 1977/78 (* Recommended)

<table>
<thead>
<tr>
<th>Variety (1)</th>
<th>Origin (2)</th>
<th>Maturity</th>
<th>Flower colour</th>
<th>Seed colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Puckley (L2)</td>
<td>Vic-M.U.</td>
<td>Early</td>
<td>White</td>
<td>White</td>
</tr>
<tr>
<td>* Derrimut</td>
<td>Vic-M.U.</td>
<td>V.Early</td>
<td>Purple</td>
<td>Dun</td>
</tr>
<tr>
<td>Dun (Early Dun)</td>
<td>?</td>
<td>Midseason</td>
<td>Purple</td>
<td>White</td>
</tr>
<tr>
<td>* White Brunswick</td>
<td>W.A.-P.B.</td>
<td>Early</td>
<td>White</td>
<td>White</td>
</tr>
</tbody>
</table>

(1) Former names in brackets. (2) Vic-M.U. = Melbourne University, Victoria. W.A.-P.B. = Private breeder (farmer) — W.A.
**Linseed varieties for 1977/78 (* Recommended)**

<table>
<thead>
<tr>
<th>Variety (I)</th>
<th>Origin</th>
<th>Maturity</th>
<th>Flower colour</th>
<th>Seed colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linseed (Linum usitatissimum)</td>
<td>Vic.-D.A.</td>
<td>Mid.S.-Early</td>
<td>White</td>
<td>D. Brown</td>
</tr>
<tr>
<td><em>Glenelg</em></td>
<td>W.A.-D.A.</td>
<td>Mid.S.-Early</td>
<td>Blue</td>
<td>D. Brown</td>
</tr>
<tr>
<td><em>Kameniza</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rapeseed varieties for 1977/78 (* Recommended)**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Origin</th>
<th>Maturity</th>
<th>Seed</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnip Rape (B. campestris) <em>Span</em></td>
<td>Canada</td>
<td>Early</td>
<td>Small, red-brown</td>
<td>Low erucic acid</td>
</tr>
<tr>
<td><em>Summer Rape (B. napus) Midas</em></td>
<td>Canada</td>
<td>Late</td>
<td>Large dark brown</td>
<td>Low erucic acid</td>
</tr>
</tbody>
</table>

**RAPESEED**

Rapeseed is a crop with considerable potential but is restricted by the lack of suitable varieties with resistance to blackleg disease and with low levels of erucic acid and glucosinolate in the seeds. A maximum of 5 per cent. erucic acid has been fixed as the acceptable level for 1977/78.

Rapeseed growing is only recommended for southern areas with more than 450 mm rainfall. Sowing should be delayed (July/August in areas with more than 500 mm rainfall) to minimise blackleg incidence.

Span and Midas are recommended at present as low erucic acid rapeseed (LEAR) varieties which are less susceptible to blackleg than other varieties available, such as Zephyr or Tower (very susceptible).

The Span and Midas seed available in W.A. probably contains a mixture of high erucic acid seed and may contain too much erucic acid to be accepted for delivery. The Department of Agriculture will arrange for samples of growers' seed supplies to be analysed to check whether levels are excessive.

**Pedigrees of grain varieties grown in Western Australia**

**WHEAT**

- Bokal—Insignia/Bencubbin/Gabo
- Darkan—M.109 Crossbred (Kenya–C6041/Eureka-II/Unknown
- Eagle—Thatcher/Agropyron elongatum/3* Falcon
- Egret—Heron*2/W.W.15
- Falcon—Dundee/Gular/Bencubbin/3/Gular Gambee—Gamenya selection
- Gamena—Gabo*6/Mentana (W1124)/2/(W1347) Gabo*2/Kenya–117A
- Gamut—Gamenya/3/Gabo/Kenya/Urquiza
- Kite—Complex cross involving Norin 10, Brevar, Eureka, Falcon and a Thatcher/Agropyron elongatum crossbred. A. elongatum is a source of rust resistance.
- Madden—Gamenya/Gabo*3/Khapstein

**BARLEY**

- Beecher—Atlas/Vaughn
- Clipper—Proctor/Prior–A
- Dampier—M.98 (selection from Olli)/Research

**OATS**

- Swan—M.127 Selection (Kent/Ballidu)
- West—M.127/Radar–2

**LUPINS**

- White lupin (L. albus)
  - Ultra—Introduced German variety
  - Narrow leafed lupin (L. angustifolius)
- Marri—Uniharvest/Rancher
- Unicrop—Complex cross among Uniw trope, N.4190, N.3048 and N.2792
- Uniharvest—Uniharvest/(N.4190) Fest

**FIELD PEAS**

- Buckley—White Brunswick/M.U.335
- Derrimit—Collegian/M.U.224C
- Dun (Early Dun)—White Brunswick

**LINSEED**

- Glenelg—Section from Bonnydoon
- Kameniza—Rust resistant selection from overseas introduction of Kameniza

**RAPE**

- Turnip rape (B. campestris)
  - Span—Developed by Agric Canada Res Stn Saskatoon
  - Summer rape (B. napus)
    - Midas—Developed by Agric Canada Res Stn Saskatoon