



1990

## Systems for very early sowing of wheat in the Central Wheatbelt of Western Australia

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**TITLE:** Systems for Very Early Sowing of Wheat in the Central Wheatbelt of Western Australia.

**PERSONAL:** A.S. Heinrich RO, R. Abbotts TO.

**DATE:** 1990

**TRIAL NUMBERS:** 90EB34, 90EB35, 90NO77-90NO80, 90NO81-90NO83, 90NO84-90NO86, 90NO87-90NO89, 90NO90-90NO92, 90NO123.

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## **SYSTEMS FOR VERY EARLY SOWING OF WHEAT IN THE CENTRAL WHEAT BELT OF WESTERN AUSTRALIA.**

|                        |  |
|------------------------|--|
| <b>FUNDING SOURCE:</b> | GRDC Wheat committee, formerly Wheat Industry Research Committee of Western Australia.                           |
| <b>OFFICERS:</b>       | Andrew Heinrich, Research Officer<br>Roger Abbotts, Technical Officer.   |
| <b>OBJECTIVE:</b>      | To develop the management system for very early sown wheat crops in the central wheat belt of Western Australia. |
| <b>TRIALS NUMBERS:</b> | 90EB34, 90EB35, 90NO77-90NO80, 90NO81-90NO83, 90NO84-90NO86, 90NO87-90NO89, 90NO90-90NO92, 90NO123.              |
| <b>RELATED TRIALS:</b> | 89EB8, 89NO8, 89NO9, 89NO10, 91EB07, 91NO18-91NO19, 91NO20, 91NO25-91NO26, 91NO27, 91NO110.                      |

Early sowing of wheat holds the answer to the greatest increase in the potential yield of wheat crops in the central wheat belt of WA. Yield declines in excess of 50 kg/ha/day delay in seeding have been recorded, thus delaying the sowing date of the crop can be very expensive. To regularly achieve high yields from early sown crops the management of the crop must be of the highest standard and new strategies implemented.

The new management strategies are summarized into the High Yield Package and can be applied the every crop. The strategies are:

- soil type selection, pick the most fertile
- rotation, establish a legume in the rotation
- weed control, control the grasses at least 1 year before the crop
- time of sowing and variety selection, sow as early as possible with an appropriate variety
- tillage method, use the tillage method that will minimise the time required to sow the crop and soil degradation.
- fertilizers, do not allow fertility to restrict the potential yield of the crop.

**TRIALS:** Seven time of sowing by variety trials were conducted throughout the Avon Districts Agricultural Centres advisory area in 1990. The sites were, Wyalkatchem, Goomalling, Grass Valley, York and the East Beverley Annex. At each of these sites 9 varieties of wheat were sown on at least 3 dates during the season, with 4 times of sowing at York and East Beverley.

Measurements recorded on each of the trials were; plant density, anthesis date, yield components, grain yield and grain quality, only grain yield and anthesis date data will be presented here.

### **General Comments:**

Early sowing of wheat represents the greatest potential for increasing the wheat yields in the central wheat belt of Western Australia as demonstrated by the results of these trials. Where the early times of sowing did not achieve the highest yields at individual sites clear reasons exist for lower yields, eg low plant density (for a number of reasons) being the main cause for low yield potential.

Anthesis dates followed the expected pattern and fitted into the flowering window where long season varieties were sown early and short season varieties were sown late. The safest flowering window for the central wheat

belt is 7 September to 27 September, when varieties flower outside these dates they are prone to frost damage and disease if they flower early and drought and high temperature if they flower late. A wide range of flowering dates were recorded in 1990 reflecting the range of sowing dates and varieties sown.

Late rain in October enabled the later sowings at most sites to achieve higher than expected yields. Excess of 35 mm of rainfall was recorded at some of the site in October. The later sowing were able to take advantage of the late rain as they had not matured.

## 90EB34 and 90EB35

LOCATION: The East Beverley Annex, 24 km east of Beverley on Ewarts Rd.

SOIL TYPE: Shallow gravelly duplex, approx 25 cm of gravelly sand over clay.

ROTATION: 1990 was the fourth year of the wheat lupin rotation on this site.

TREATMENTS: 90EB34 3 times of sowing at fortnightly intervals after the 9 th April, with 8 varieties of wheat (see tables below for details).

90EB35, 4 times of sowing at fortnightly intervals after the 23rd April with 9 varieties of wheat (see tables below).

All plots were sprayed with 35 g/ha Logran (R) IBS Where necessary Sprayseed (R) was used as the knockdown IBS. All times of sowing received 159 kg/ha Super, drilled, and 110 kg/ha Urea, topdressed IBS. Heograss (R) was used in an attempt to control the rye grass post emergence, (not successful in the 1st TOS).

**Table 1:** Grain yields (t/ha) for 8 wheat varieties at 3 very early sowing dates at East Beverley 1990 {90EB34}.

| VARIETY    | TOS 1<br>9 April | TOS 2<br>23 April | TOS 3<br>7 May |
|------------|------------------|-------------------|----------------|
| SPEAR      | 4.31             | 4.15              | 3.53           |
| AROONA     | 2.15             | 3.88              | 3.70           |
| CORRIGIN   | 3.01             | 4.33              | 3.67           |
| 78Z:895    | 3.60             | 3.95              | 3.41           |
| RAC529:911 | 2.63             | 4.05              | 3.74           |
| 80Z:929    | 3.71             | 4.25              | 3.61           |
| OSPREY     | 2.53             | 3.19              | 2.84           |
| OWLET      | 1.65             | 1.57              | 1.94           |

**Table 2:** Grain protein content of 8 wheat varieties at 3 very early sowing dates at East Beverley 1990 {90EB34}.

| VARIETY    | TOS 1<br>9 April | TOS 2<br>23 April | TOS 3<br>7 May |
|------------|------------------|-------------------|----------------|
| SPEAR      | 8.8              | 7.75              | 8.3            |
| AROONA     | 10.3             | 8.8               | 8.15           |
| CORRIGIN   | 8.4              | 7.55              | 7.8            |
| 78Z:895    | 9.05             | 8.5               | 9.0            |
| RAC529:911 | 9.16             | 8.4               | 8.45           |
| 80Z:929    | 8.8              | 8.55              | 8.0            |
| OSPREY     | 8.95             | 9.05              | 9.35           |
| OWLET      | 10.05            | 9.8               | 10.6           |

**Table 3:** Anthesis dates for 8 varieties of wheat at 3 very early sowing dates at East Beverley 1990 {90EB34}.

| VARIETY    | TOS 1<br>9 April | TOS 2<br>23 April | TOS 3<br>7 May |
|------------|------------------|-------------------|----------------|
| SPEAR      | 7 Sep            | 16 Sep            | 28 Sep         |
| AROONA     | 1 Sep            | 31 Aug            | 21 Sep         |
| CORRIGIN   | 9 Sep            | 7 Sep             | 24 Sep         |
| 78Z:895    | 4 Sep            | 17 Sep            | 27 Sep         |
| RAC529:911 | 5 Sep            | 6 Sep             | 26 Sep         |
| 78Z:929    | 7 Sep            | 17 Sep            | 25 Sep         |
| OSPREY     | 29 Sep           | 1 Oct             | 1 Oct          |
| OWLET      | 15 Oct           | 17 Oct            | 23 Oct         |

**Table 4:** Grain yield (t/ha) for 9 varieties of wheat at 4 times of sowing at East Beverley 1990.

| VARIETY  | TOS 1<br>23 April | TOS 2<br>7 May | TOS 3<br>21 May | TOS4<br>5 June |
|----------|-------------------|----------------|-----------------|----------------|
| SPEAR    | 4.25              | 3.48           | 3.93            | 2.61           |
| REEVES   | 3.87              | 3.59           | 3.77            | 2.64           |
| AROONA   | 3.98              | 3.26           | 3.69            | 2.49           |
| KULIN    | 2.29              | 3.90           | 4.03            | 2.98           |
| HALBERD  | 3.45              | 2.91           | 3.03            | 2.33           |
| BLADE    | 3.26              | 2.87           | 3.39            | 2.34           |
| ERADU    | 2.12              | 2.99           | 3.56            | 2.40           |
| GUTHA    | 2.41              | 2.93           | 2.96            | 2.56           |
| WILGOYNE | 2.30              | 2.77           | 3.37            | 2.14           |

**Table 5:** Anthesis dates for 9 varieties of wheat at 4 times of sowing at East Beverley 1990.

| VARIETY  | TOS 1<br>23 April | TOS 2<br>7 May | TOS 3<br>21 May | TOS4<br>5 June |
|----------|-------------------|----------------|-----------------|----------------|
| SPEAR    | 17 Sep            | 26 Sep         | 29 Sep          | 11 Oct         |
| REEVES   | 8 Sep             | 21 Sep         | 24 Sep          | 7 Oct          |
| AROONA   | 8 Sep             | 22 Sep         | 25 Sep          | 2 Oct          |
| KULIN    | 24 Aug            | 17 Sep         | 20 Sep          | 7 Oct          |
| HALBERD  | 17 Sep            | 24 Sep         | 30 Sep          | 10 Oct         |
| BLADE    | 7 Sep             | 26 Sep         | 27 Sep          | 7 Oct          |
| ERADU    | 25 Aug            | 18 Sep         | 25 Sep          | 30 Sep         |
| GUTHA    | 3 Sep             | 18 Sep         | 21 Sep          | 29 Sep         |
| WILGOYNE | 22 Aug            | 19 Sep         | 29 Sep          | 29 Sep         |

**90NO77-90NO80**

**NB:** Each time of sowing has a separate trial number, 90NO77 TOS 1, 90NO78 TOS 2, 90NO79 TOS 3 and 90NO80 TOS 4.

**LOCATION:** JA Chipper and Son, York. Trial site was located on Boyercutty Rd, having a westerly aspect and being in the upper part of the landscape.

**SOIL TYPE:** Avon Valley loam, 15-20 cm sandy loam over loamy clay to 40 cm with clay at depth.

**ROTATION:** The paddock was sown to lupins in 1989.

**TREATMENTS:**

- 4 times of sowing 26/4/90, 14/5/90, 28/5/90, 11/6/90
- All times of sowing were sprayed with 35 g/ha Logran (R) IBS.  
Sprayseed was used as the knockdown where necessary.
- Fertilizers were 154 kg/ha Super drilled and 110 kg/ha Urea topdressed IBS.
- No post emergent weed control was required.
- The paddock was ploughed by the farmer following a rain in March leaving the surface very rough and cloddy.

**Table 6:** Grain yields (t/ha) for 9 wheat varieties at 4 times of sowing at York 1990.

| VARIETY  | TOS 1<br>26 APRIL | TOS 2<br>14 MAY | TOS 3<br>28 MAY | TOS4<br>11 JUNE |
|----------|-------------------|-----------------|-----------------|-----------------|
| SPEAR    | 3.46              | 4.74            | 4.30            | 4.09            |
| REEVES   | 3.63              | 4.59            | 4.03            | 3.53            |
| AROONA   | 3.39              | 4.50            | 3.93            | 3.72            |
| KULIN    | 3.63              | 4.34            | 3.91            | 3.30            |
| HALBERD  | 3.61              | 4.56            | 3.87            | 3.78            |
| BLADE    | 3.24              | 3.29            | 2.89            | 3.20            |
| ERADU    | 3.10              | 4.30            | 3.83            | 3.36            |
| GUTHA    | 3.63              | 4.15            | 4.17            | 3.55            |
| WILGOYNE | 2.67              | 3.96            | 3.35            | 3.26            |

**Table 7:** Anthesis dates for 9 varieties of wheat at 4 times of sowing at York 1990.

| VARIETY  | TOS 1<br>26 APRIL | TOS 2<br>14 MAY | TOS 3<br>28 MAY | TOS4<br>11 JUNE |
|----------|-------------------|-----------------|-----------------|-----------------|
| SPEAR    | 16 Sep            | 26 Sep          | 1 Oct           | 8 Oct           |
| REEVES   | 10 Sep            | 21 Sep          | 28 Sep          | 6 Oct           |
| AROONA   | 5 Sep             | 21 Sep          | 27 Sep          | 5 Oct           |
| KULIN    | 7 Sep             | 17 Sep          | 25 Sep          | 2 Oct           |
| HALBERD  | 17 Sep            | 24 Sep          | 1 Oct           | 9 Oct           |
| BLADE    | 17 Sep            | 25 Sep          | 1 Oct           | 8 Oct           |
| ERADU    | 28 Aug            | 18 Sep          | 25 Sep          | 30 Sep          |
| GUTHA    | 1 Sep             | 17 Sep          | 25 Sep          | 1 Oct           |
| WILGOYNE | 3 Sep             | 17 Sep          | 25 Sep          | 1 Oct           |



**90NO81-90NO83**

NB: Each time of sowing has a separate trial number.

LOCATION: Doug Sewell, Goomalling, Urcarty Rd. The site had a south-westerly aspect in the middle of the landscape.

SOIL TYPE: Deep yellow acid sand.

ROTATION: Wheat/lupin rotation.

TREATMENTS:

- 3 times of sowing 25/4/90, 31/5/90, 13/6/90 with 9 varieties of wheat (see below).
- Fertilizers were 104 kg/ha of Super, drilled, and 104 kg/ha Urea topdressed IBS.
- All times of sowing received 35 g/ha Logran (R) IBS and Sprayseed was used as the knockdown where needed.
- The first time of sowing was severely sand blasted on 2 occasions, rep 3 suffered the least damage of all.

**Table 8:** Grain yields (t/ha) for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>25 April | TOS 2<br>31 May | TOS3<br>13June |
|----------|-------------------|-----------------|----------------|
| SPEAR    | 2.23              | 1.15            | 1.16           |
| REEVES   | 1.68              | 1.17            | 1.10           |
| AROONA   | 1.86              | 1.17            | 1.10           |
| KULIN    | 1.41              | 1.05            | 1.08           |
| HALBERD  | 1.80              | 1.09            | 1.11           |
| BLADE    | 1.51              | 1.04            | 0.92           |
| ERADU    | 1.32              | 0.96            | 0.92           |
| GUTHA    | 20.1              | 1.18            | 1.04           |
| WILGOYNE | 1.38              | 1.05            | 0.97           |

**Table 9:** Anthesis dates for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>25 April | TOS 2<br>31 May | TOS3<br>13June |
|----------|-------------------|-----------------|----------------|
| SPEAR    | 10 Sep            | 24 Sep          | 26 Sep         |
| REEVES   | 4 Sep             | 24 Sep          | 25 Sep         |
| AROONA   | 3 Sep             | 26 Sep          | 26 Sep         |
| KULIN    | 5 Sep             | 16 Sep          | 26 Sep         |
| HALBERD  | 10 Sep            | 25 Sep          | 30 Sep         |
| ERADU    | 2 Sep             | 17 Sep          | 26 Sep         |
| GUTHA    | 27 Aug            | 25 Sep          | 30 Sep         |
| WILGOYNE | 25 Aug            | 15 Sep          | 26 Sep         |

90NO84-90NO86

NB: Each time of sowing has a separate trial number.

LOCATION: J Kelly, Quellington Rd, Grass Valley.

SOIL TYPE: Gravelly duplex, approx 20 cm gravelly sand over gravel and clay at approx 40 cm.

ROTATION: Manipulated pasture for the previous 2 years leaving a pure sub-clover stand.

TREATMENTS: - 3 times of sowing 27/4/90, 28/5/90, 11/6/90 with 9 varieties of wheat (see below).  
- Fertilizers were 154 kg/ha Super, drilled, and 104 kg/ha Urea, topdressed IBS.  
- All times of sowing received 35 g/ha Logran (R) IBS.

- Very patchy germination in the 1st time of sowing and grubs (cut worm and/or web worm) may have thinned the plant density considerably.

**Table 10:** Grain yields (t/ha) for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>27 April | TOS 2<br>28 May | TOS 3<br>11 June |
|----------|-------------------|-----------------|------------------|
| SPEAR    | 3.63              | 3.61            | 3.68             |
| REEVES   | 4.02              | 4.10            | 3.45             |
| AROONA   | 3.59              | 3.40            | 3.02             |
| KULIN    | 3.88              | 4.10            | 3.71             |
| HALBERD  | 3.22              | 3.41            | 3.23             |
| BLADE    | 3.11              | 2.87            | 2.87             |
| ERADU    | 2.80              | 3.51            | 3.01             |
| GUTHA    | 2.99              | 3.94            | 3.13             |
| WILGOYNE | 2.41              | 3.50            | 3.06             |

**Table 11:** Anthesis dates for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>27 April | TOS 2<br>28 May | TOS 3<br>11 June |
|----------|-------------------|-----------------|------------------|
| SPEAR    | 11 Sep            | 28 Sep          | 5 Oct            |
| REEVES   | 5 Sep             | 26 Sep          | 30 Sep           |
| AROONA   | 30 Aug            | 26 Sep          | 30 Sep           |
| KULIN    | 1 Sep             | 24 Sep          | 29 Sep           |
| HALBERD  | 11 Sep            | 29 Sep          | 5 Oct            |
| BLADE    | 6 Sep             | 29 Sep          | 1 Oct            |
| ERADU    | 29 Aug            | 25 Sep          | 28 Sep           |
| GUTHA    | 27 Aug            | 25 Sep          | 28 Sep           |
| WILGOYNE | 28 Aug            | 26 Sep          | 30 Sep           |

**90NO87-90NO89**

**NB:** Each time of sowing has a separate trial number.

**LOCATION:** G Bookham, Wyalkatchem.  
Gnuca siding, Wyalkatchem-Koorda Rd.

**SOIL TYPE:** Red/brown loamy clay (Salmon gum country) little or no slope and low in the landscape.

**ROTATION:** Field pea/wheat rotation.

**TREATMENTS:**

- 3 times of sowing 24/4/90, 13/6/90, 22/6/90 with 9 varieties of wheat (see below).
- All times of sowing received 35 g/ha Logran (R) IBS and Sprayseed (R) was used as the knockdown where required.
- All times of sowing received 104 kg/ha Super, drilled and 104 kg/ha Urea topdressed IBS.

**Table 12:** Grain yields (t/ha) for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>6 June | TOS 2<br>13 June | TOS 3<br>22 June |
|----------|-----------------|------------------|------------------|
| SPEAR    | 3.02            | 2.96             | 2.38             |
| REEVES   | 2.60            | 2.86             | 2.33             |
| AROONA   | 2.92            | 2.91             | 2.50             |
| KULIN    | 3.02            | 2.88             | 2.47             |
| HALBERD  | 2.51            | 2.96             | 2.59             |
| BLADE    | 2.39            | 2.50             | 2.50             |
| ERADU    | 2.77            | 2.94             | 2.28             |
| GUTHA    | 2.83            | 2.93             | 2.36             |
| WILGOYNE | 2.42            | 2.65             | 2.38             |

**Table 13:** Anthesis dates for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>6 June | TOS 2<br>13 June | TOS 3<br>22 June |
|----------|-----------------|------------------|------------------|
| SPEAR    | 30 Sep          | 2 Oct            | 10 Oct           |
| REEVES   | 29 Sep          | 30 Sep           | 1 Oct            |
| AROONA   | 27 Sep          | 30 Sep           | 3 Oct            |
| KULIN    | 25 Sep          | 30 Sep           | 28 Sep           |
| BLADE    | 30 Sep          | 30 Sep           | 5 Oct            |
| ERADU    | 25 Sep          | 29 Sep           | 1 Oct            |
| GUTHA    | 24 Sep          | 29 Sep           | 29 Sep           |
| WILGOYNE | 26 Sep          | 29 Sep           | 2 Oct            |

**90NO90-90NO92**

NB: Each time of sowing has a separate trial number.

LOCATION: G Bookham, Wyalkatchem.

Gnuca siding, Wyalkatchem-Koorda Rd.

SOIL TYPE: Deep acid sand, in the upper landscape having a westerly aspect.

ROTATION: Wheat/lupin.

TREATMENTS: - 3 times of sowing 24/4/90, 7/6/90, 22/6/90 with 9 varieties of wheat (see below).

- All times of sowing received 104 kg/ha Super, drilled, and 104 kg/ha Urea topdressed IBS.

Sprayseed was used as the knockdown on all times of sowing and all times of sowing received 35 g/ha Logran (R) IBS.

**Table 14:** Grain yields (t/ha) for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>24 April | TOS 2<br>7 June | TOS 3<br>22 June |
|----------|-------------------|-----------------|------------------|
| SPEAR    | 1.35              | 1.55            | 1.25             |
| REEVES   | 1.05              | 1.19            | 1.24             |
| AROONA   | 0.73              | 0.91            | 1.08             |
| KULIN    | 0.69              | 1.27            | 1.20             |
| HALBERD  | 1.10              | 1.22            | 1.07             |
| BLADE    | 1.04              | 1.18            | 1.02             |
| ERADU    | 0.76              | 1.00            | 1.02             |
| GUTHA    | 0.76              | 1.22            | 1.15             |
| WILGOYNE | 0.46              | 0.75            | 0.75             |

**Table 15:** Anthesis dates for 9 varieties of wheat at 3 times of sowing at Goomalling 1990.

| VARIETY  | TOS 1<br>24 April | TOS 2<br>7 June | TOS 3<br>22 June |
|----------|-------------------|-----------------|------------------|
| SPEAR    | 18 Sep            | 29 Sep          | 4 Oct            |
| REEVES   | 16 Sep            | 25 Sep          | 30 Sep           |
| AROONA   | 10 Sep            | 27 Sep          | 30 Sep           |
| KULIN    | 14 Sep            | 25 Sep          | 29 Sep           |
| HALBERD  | 19 Sep            | 30 Sep          | 4 Oct            |
| BLADE    | 18 Sep            | 30 Sep          | 2 Oct            |
| ERADU    | 16 Sep            | 20 Sep          | 30 Sep           |
| GUTHA    | 16 Sep            | 21 Sep          | 29 Sep           |
| WILGOYNE | 7 Sep             | 20 Sep          | 30 Sep           |

**90NO123**

**LOCATION:** Cunderdin Agricultural College, Cunderdin.

**SOIL TYPE:** Shallow duplex, approx 15-20 cm sand over clay, flat or very little slope.

**ROTATION:** Wheat/lupins.

**TREATMENTS:** 3 times of sowing 8/6/90, 19/6/90, 29/6/90 with 3 varieties of wheat, Spear, Aroona and Kulin. The trial was an unreplicated design using 1 ha plots sown with a 20 run culti-trash. Seed rate of 65 kg/ha was used with 100 kg/ha of Super drilled with the seed and 100 kg/ha Urea topdressed IBS or IAS. 35 g/ha of Logran (R) was applied IBS at each time of sowing.

**Table 16:** Grain yields for 3 varieties of wheat at 3 late sowing dates at Cunderdin Agricultural College 1990.

| VARIETY | TOS 1<br>8 June | TOS 2<br>19 June | TOS 3<br>29 June |
|---------|-----------------|------------------|------------------|
| SPEAR   | 1.22            | 1.54             | 1.53             |
| AROONA  | 1.24            | 1.29             | 1.46             |
| KULIN   | 1.04            | 1.54             | 1.41             |

Delayed sowing appears to have an advantage at this site in 1990, please note the very late sowing dates, these would not be recommended in any year for this area. The later sowing were able to take greater advantage of the October rainfall hence increasing their yields.