Bare patch and poor emergence of cereals. 4. Quality of the seed

S C. Chambers

Follow this and additional works at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4

Part of the Agronomy and Crop Sciences Commons, and the Plant Biology Commons

Recommended Citation
Chambers, S C. (1963) "Bare patch and poor emergence of cereals. 4. Quality of the seed," Journal of the Department of Agriculture, Western Australia, Series 4: Vol. 4 : No. 4 , Article 4.
Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4/vol4/iss4/4

This article is brought to you for free and open access by Research Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 4 by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au.
Bare patch and poor emergence of cereals. 4. Quality of the seed

Cover Page Footnote
Grateful acknowledgment is made to Mr. L. Price for assistance with the field work and to Miss. P. Thomson for the statistical analysis of results. This project was financed by a grant from the Wheat Research Committee of Western Australia.
IMPORTANT DISCLAIMER

This document has been obtained from DAFWA's research library website (researchlibrary.agric.wa.gov.au) which hosts DAFWA's archival research publications. Although reasonable care was taken to make the information in the document accurate at the time it was first published, DAFWA does not make any representations or warranties about its accuracy, reliability, currency, completeness or suitability for any particular purpose. It may be out of date, inaccurate or misleading or conflict with current laws, polices or practices. DAFWA has not reviewed or revised the information before making the document available from its research library website. Before using the information, you should carefully evaluate its accuracy, currency, completeness and relevance for your purposes. We recommend you also search for more recent information on DAFWA's research library website, DAFWA's main website (https://www.agric.wa.gov.au) and other appropriate websites and sources.

Information in, or referred to in, documents on DAFWA's research library website is not tailored to the circumstances of individual farms, people or businesses, and does not constitute legal, business, scientific, agricultural or farm management advice. We recommend before making any significant decisions, you obtain advice from appropriate professionals who have taken into account your individual circumstances and objectives.

The Chief Executive Officer of the Department of Agriculture and Food and the State of Western Australia and their employees and agents (collectively and individually referred to below as DAFWA) accept no liability whatsoever, by reason of negligence or otherwise, arising from any use or release of information in, or referred to in, this document, or any error, inaccuracy or omission in the information.

This article is available in Journal of the Department of Agriculture, Western Australia, Series 4: https://researchlibrary.agric.wa.gov.au/journal_agriculture4/vol4/iss4/4
Bare Patch and Poor Emergence of Cereals

- Factors Under Investigation

4. QUALITY OF THE SEED

By S. C. CHAMBERS, M.Sc., Plant Pathologist

The importance of using fresh good quality grain for sowing wheat crops was emphasised by results obtained in recent plot trials.

Seedling emergence was less for broken, pinched and small types of seed than for large grain and was further reduced with ageing of the seed.

Numerous reports of poor emergence of cereals have been received during the past few seasons, particularly from the Moora, Narrogin and Northam districts. Although parasitic fungi are sometimes responsible, investigations have shown deep sowing to be one of the main causes of the problem. Another important factor has been the crusting of the surface soil, especially in heavier soils.

There has in a few instances been indirect evidence that the sowing of poor quality seed may have contributed to the poor emergence of crops. As there was little local data concerning the emergence of wheat in relation to seed quality, work was undertaken to assess this factor.

EXPERIMENT

A sample of wheat seed (variety Gabo) from the 1960-61 crop at Merredin Research Station was separated into four grain types; they were large, small, pinched and broken (Fig. 1).

On September 7, 1961, seed of the four types was hand-sown one inch deep in small plots at South Perth. The soil in the experimental area was a coarse sand typical of the Swan coastal plain.

The experimental design was a simple randomized plot system which included five replications of the four types of seed. Each individual plot contained 50 seeds sown in five rows of 10 with 2 inches between each seed.

At the same time a germination test was carried out in the laboratory by placing seeds on moist filter paper in petri dishes and incubating at 20° C for six days. Again the experimental design was a simple randomized system but contained 10 replications of the four seed types with 10 seeds in each petri dish.

The experiment was repeated using the same seed sample on June 5, 1962 (nine months later). This differed from the earlier experiment in that the number of seeds in each field plot was increased to 100 and the replications to 10.
RESULTS

Counts were taken of seeds which had germinated in the laboratory after six days (Table 1) and seedlings which had emerged in the plots after 35 days (Table 2.)

### TABLE 1
**Effect of Type and Age of Seed on Germination**

<table>
<thead>
<tr>
<th>Type of Seed</th>
<th>Percentage Germination for Seed Aged</th>
<th>Transformed Values for Seed Aged</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9 months</td>
<td>18 months</td>
</tr>
<tr>
<td>Large</td>
<td>95</td>
<td>98</td>
</tr>
<tr>
<td>Pinched</td>
<td>99</td>
<td>94</td>
</tr>
<tr>
<td>Small</td>
<td>91</td>
<td>80</td>
</tr>
<tr>
<td>Broken</td>
<td>21</td>
<td>11</td>
</tr>
</tbody>
</table>

Difference for significance \( P = 0.05 \) ...

\( P = 0.01 \) ...

(Counts analysed using the transformation arc sin \( \sqrt{\%} \).)

### TABLE 2
**Effect of Type and Age of Seed on Emergence**

<table>
<thead>
<tr>
<th>Type of Seed</th>
<th>Percentage Emergence for Seed Aged</th>
<th>Transformed Values for Seed Aged</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9 months</td>
<td>18 months</td>
</tr>
<tr>
<td>Large</td>
<td>85.6</td>
<td>77.4</td>
</tr>
<tr>
<td>Pinched</td>
<td>73.2</td>
<td>67.4</td>
</tr>
<tr>
<td>Small</td>
<td>71.6</td>
<td>60.8</td>
</tr>
<tr>
<td>Broken</td>
<td>3.2</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Difference for significance \( P = 0.05 \) ...

\( P = 0.01 \) ...

\( 8.0 \) \( 3.3 \)

\( 8.4 \) \( 4.4 \)

DISCUSSION

From the results in Table 1 it is evident that there was no significant difference between the germination of pinched (99 per cent.), small (91 per cent.) and large grain (95 per cent.), nine months after harvest. However, despite these similar germination values, the emergence of seedlings was considerably less for pinched and small seeds than for large grain (73...
per cent. and 72 per cent. compared with 86 per cent.—Table 2.)

The emergence of a seedling depends largely on having enough food reserve in the seed for it to grow up through the soil barrier to the surface. The higher percentage emergence of large grain indicates a greater food reserve in this type of seed than in small and pinched grain.

In this experiment, the grain was sown one inch deep as deep sowing had previously been shown to reduce emergence (Chambers 1961). Deeper sowing would therefore have caused a further reduction in emergence, which in all probability, would have been greatest in seed with low food reserves.

Germination and seedling emergence were extremely low in broken seed (Tables 1 and 2). This was probably due to injuries to the wheat germs (embryoes), of this seed.

The effects of ageing on germination and seedling emergence are also shown in Tables 1 and 2. There was no difference between germination of large seed nine and 18 months after harvest. However, the emergence of seedlings using such grain tended to decrease with time, suggesting a gradual depletion of energy reserves in the seed. With small, pinched and broken grain, both germination and emergence values tended to decrease with age.

The age factor would not apply to most crops as they are usually sown with seed from the previous season. However, occasionally when there is an excess demand for a particular variety, old grain is sometimes used as seed. Under these circumstances, the emergence would probably be below average.

RECOMMENDATIONS

In view of the overall results, it is recommended that only the best quality plump grain be used for seeding.

Care should also be taken to ensure that the seed is sown at a depth of 1 to 1½ inches. Deeper sowing will reduce emergence.

REFERENCES


ACKNOWLEDGMENTS

Grateful acknowledgment is made to Mr. L. Price for assistance with the field work and to Miss. P. Thomson for the statistical analysis of results.

This project was financed by a grant from the Wheat Research Committee of Western Australia.
ON-THE-SPOT storage

Plan your property layout so as to provide Lysaght 500-bushel Grain Silos in each stock paddock... for the safe storage of feed oats over long periods and the quick easy feeding of stock when normal transport conditions are impossible.

The commonsense way to avoid stock losses during foods, drought or fire, Lysaght 500-bushel Grain Silos improve the value of your holding and put extra profits into your bank account every year.

LYSAGHT 500 BUSHEL GRAIN SILOS

* Patent Pending No. 55007/59

- Vertically rigidised walls and 6-ply horizontal ribs for added strength.
- Two bagging outlets complete with steel covers.
- Improved centre and side-filling hole assemblies, complete with hinged lids and positive fastenings.
- Combined roof step and ladder support.
- Wide turned-down eaves on roof panels.
- Segmented steel floor.
- Fully rodent-proof construction.
- Steel earth ring (optional extra).

LYSAGHT SILOS PRICES — Ex Fremantle Store

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>Steel SILO</th>
<th>Steel Earth Ring (Optional Extra)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 (Corr.) Bushels</td>
<td>£58</td>
<td>£7 0 0</td>
</tr>
<tr>
<td>250 Elev (Corr.) Bushels</td>
<td>£157</td>
<td>—</td>
</tr>
<tr>
<td>500 New Type</td>
<td>£233</td>
<td>£11 10 0</td>
</tr>
<tr>
<td>1,200 New Type</td>
<td>£772</td>
<td>£21 0 0</td>
</tr>
<tr>
<td>2,000 New Type</td>
<td>£1040</td>
<td>£22 0 0</td>
</tr>
<tr>
<td>3,100 New Type</td>
<td>£313</td>
<td>£31 10 0</td>
</tr>
<tr>
<td>3,700 New Type</td>
<td>£347</td>
<td>£31 10 0</td>
</tr>
</tbody>
</table>

* Prices include steel floor.

Silos from 1,200 bushels capacity upwards are fitted with full-size "walk-in" door.

JOHN LYSAUGHT (AUSTRALIA) LIMITED
8 Pakenham Street, Fremantle, W.A.

Manufactured by: John Lysaght (Australia) Limited. Special Products Division, Newcastle Works, Newcastle, N.S.W.
Big power, super transmission, modern hydraulics. Every feature speeds Super Dexta's work-rate!

We tested Super Dexta against champion athletes. Over a measured mile Super Dexta out-paced them all. This top gear performance is indicative of the pace-setting features of Super Dexta. Through the gear-range you select the right power for the job with plenty of overlap between 17.4 and 0.6 m.p.h. With Super Dexta's 39.5 horsepower diesel engine you can slow to half speed and still maintain full engine power. Excellent selection of gear speeds lets you operate in varying conditions at the fastest rate without the need for frequent gear changes. Super Dexta has P.T.O. power to spare, 34.2 H.P. — cuts delays. Diff-lock (standard equipment) stops wheelspin, keeps you going when other tractors bog down. Modern hydraulics speed work, with simple-to-use single-lever control. See your Ford Tractor and Implement Dealer for a demonstration on your property! Live power take-off optional extra, £35. F.O.B. Ford Plants

£1103

FORDSON

SUPER DEXTA

THE FORD WORK-FORCE FARMS AUSTRALIA — SUPER MAJOR • SUPER DEXTA • PETROL DEXTA — POWER-MATCHED IMPLEMENTS

Please mention the "Journal of Agriculture of W.A.," when writing to advertisers.