

**CIHM
Microfiche
Series
(Monographs)**

**ICMH
Collection de
microfiches
(monographies)**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1994

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être unques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

☐ Coloured covers/
Couverture de couleur

☐ Covers damaged/
Couverture endommagée

☐ Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

☐ Cover title missing/
Le titre de couverture manque

☐ Coloured maps/
Cartes géographiques en couleur

☐ Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

☐ Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

☐ Bound with other material/
Relié avec d'autres documents

☐ Tight binding may cause shadows or distortion
along interior margin/
La reliure serrée peut causer de l'ombre ou de la
distorsion le long de la marge intérieure

☐ Blank leaves added during restoration may appear
within the text. Whenever possible, these have
been omitted from filming/
Il se peut que certaines pages blanches ajoutées
lors d'une restauration apparaissent dans le texte,
mais, lorsque cela était possible, ces pages n'ont
pas été filmées.

☐ Additional comments: /
Commentaires supplémentaires:

☐ Coloured pages/
Pages de couleur

☐ Pages damaged/
Pages endommagées

☐ Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

☒ Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

☐ Pages detached/
Pages détachées

☒ Showthrough/
Transparence

☒ Quality of print varies/
Qualité inégale de l'impression

☐ Continuous pagination/
Pagination continue

☐ Includes index(es)/
Comprend un (des) index

Title on header taken from: /
Le titre de l'en-tête provient:

☐ Title page of issue/
Page de titre de la livraison

☐ Caption of issue/
Titre de départ de la livraison

☐ Masthead/
Générique (périodiques) de la livraison

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10x	12x	14x	16x	18x	20x	22x	24x	26x	28x	30x	32x
						✓					

The copy filmed here has been reproduced thanks to the generosity of:

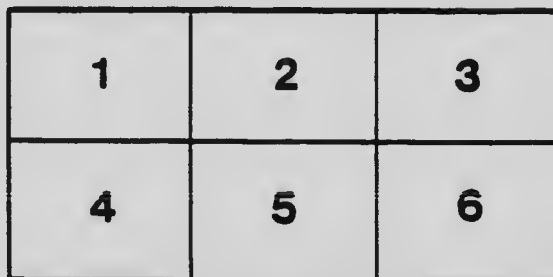
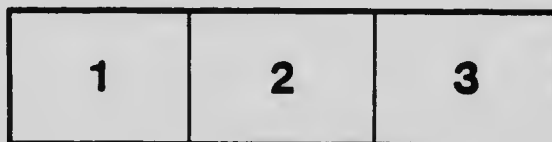
Library
Agriculture Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \longrightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

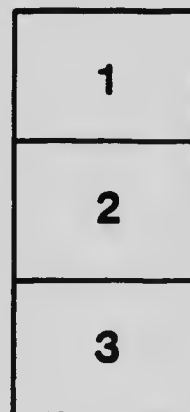
Bibliothèque
Agriculture Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

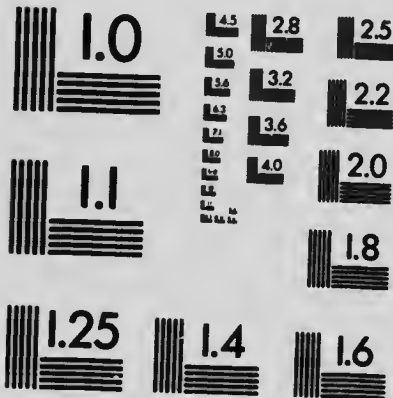
Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \longrightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester New York 14609 USA
(716) 482 - 0300 - Phone
(716) 288 - 5989 - Fax

A.I.

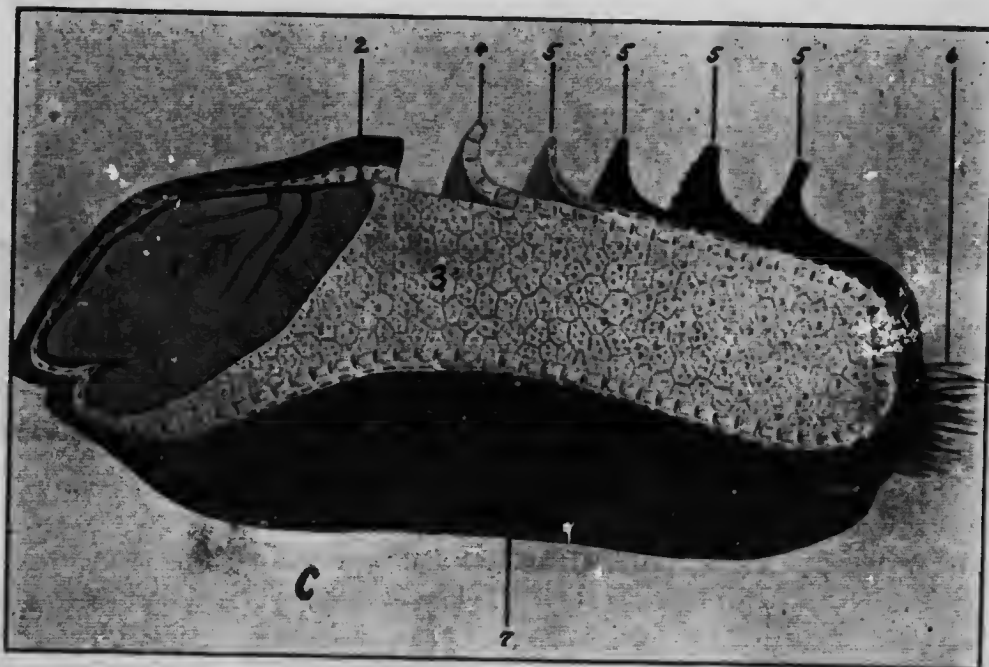
GOVERNMENT OF THE PROVINCE OF SASKATCHEWAN
DEPARTMENT OF AGRICULTURE

FIELD HUSBANDRY CIRCULAR No. 24

The Value of Rusted or Shrunken Wheat for Seed

By JOHN BRACKEN

Professor of Field Husbandry, University of Saskatchewan



C—Model of longitudinal section through wheat seed showing (1) Embryo or miniature plant (2) Scutellum (3) Endosperm or store house of plant food for the embryo (4) Aleurone layer and (5) layers of the bran.

J. W. Reid, King's Printer
1917

630.4
5252 C.2
rec 20



A—Photo-micrograph of Cross-section of Wheat Seed from Badly Rusted Crop.
B—Same of Plump Seed from an Undiseased Plant.

GOVERNMENT OF THE PROVINCE OF SASKATCHEWAN
Department of Agriculture

FIELD HUSBANDRY CIRCULAR No. 24

The Value of Rusted or Shrunken Wheat for Seed

By JOHN BRACKEN

Professor of Field Husbandry, University of Saskatchewan

NEARLY nine million acres of land will be sown to wheat in Saskatchewan in 1917. In about one-sixth of this area the seed is perhaps as good as in the average year. In over one half of it the crop from which seed would ordinarily be taken has been more or less seriously damaged by rust. In some parts of the province the grain has been injured by frost, and in others weathering, snow and heating have lowered the value of the grain for seed.

The question in the minds of thousands of crop growers is, "shall I use my own seed or purchase better?"

This is a question that is important under some conditions in different communities every year, but in certain districts this year the answer that will be given it is likely to result in serious consequences. The purpose of this discussion is to present some data and observations that will aid the crop grower in arriving at a safe decision regarding the value of his grain for seed.

WHAT IS GOOD SEED ?

The factors that determine the value of wheat for seed are:—

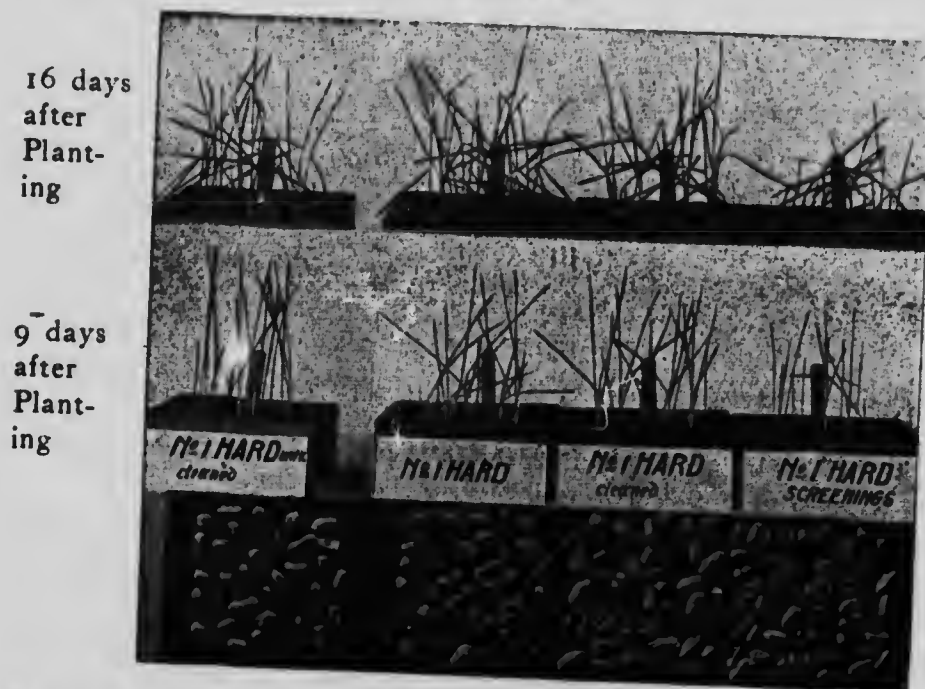
1. The proportion of it that will grow.
2. The vigor of the growth.
3. Its freedom from weed seeds.
4. Its freedom from disease.
5. Its freedom from other grains, other varieties and foreign matter.
6. Its suitability to the district.

Those factors that are of particular importance at this time are the first and second—the proportion that will grow and the vigor of the growth. It is an easy matter to get a suitable variety and it is not very difficult to see that the seed is clean and free from disease, although many are careless about these simple matters. All these requirements are important but this season the vigor of growth is much more important as compared with the others than in any season since the frosted crop of 1911.

The photographs and germination records illustrate the vigor of growth and give the weight per bushel, the number of seeds per bushel, the percentage germination, the number of germinable seeds

per acre, and the weight of 1000 kernels from a sample of No. 1 hard, samples of No. 4 Special, No. 6 Special, No. 4, No. 6, Feed, and three miscellaneous samples. In each of No. 1 Hard, No. 4 Special, No. 6 Special, No. 4, No. 6 and Feed, this information is given for the original, the cleaned portion and the screenings. In addition to a photograph of the seed itself, the vigor of growth 9 days after planting is shown immediately above it, and the vigor 16 days after planting is shown at the top. The figures in brackets for per cent germination are for 6 days after planting, those not in brackets for 10 days after planting.

NO. 1 HARD



Weight per Bushel...	64 1-2	63		
Number of Seeds per Bushel in 1000's...	782	1019	975	1986
PerCent Germination 100	(100)100	(100)100	(100)100	(72)84
Number of Germinable Seeds per Bushel...	782	975	1019	1668
Weight of 1000 Kernels in Grams...	34.8	26.7	27.9	13.7

This sample of wheat germinated perfectly and all plants were quite vigorous. Even the screenings germinated almost as high as the best of the other samples and the vigor is noticeably greater than in any of them.

NO. 4 SPECIAL

16 days
after
Plant-
ing

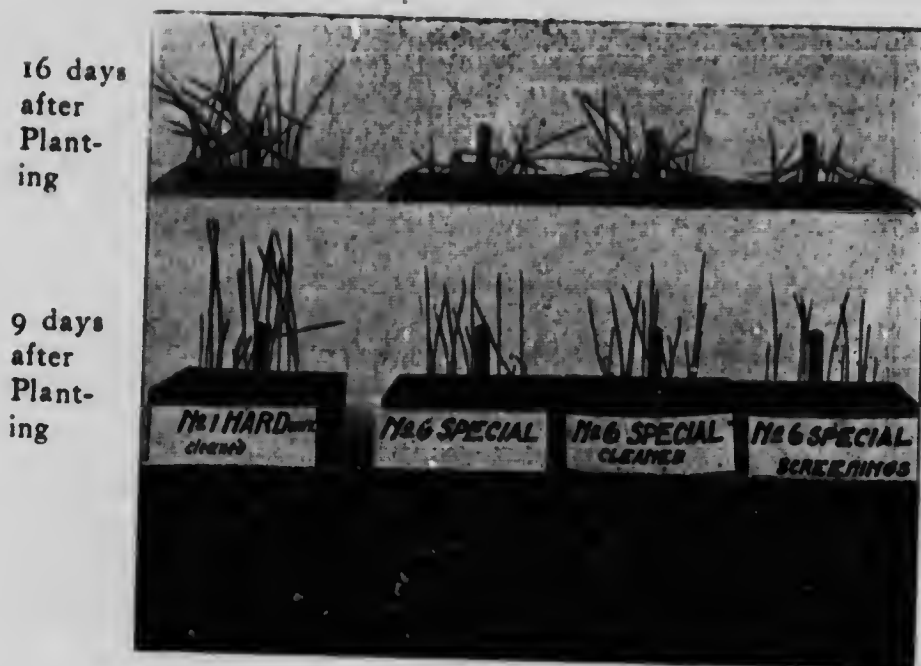
9 days
after
Plant-
ing



<i>Weight per Bushel... 64 1-2</i>	55		
<i>Number of Seeds per Bushel in 1000's... 782</i>	1509	1334	2143
<i>Per Cent Germination 100</i>	(84)92	(88)96	(32)52
<i>Number of Germinable Seeds per Bushel... 782</i>	1388	1281	1114
<i>Weight of 1000 Kernels in Grams... 34.8</i>	18.04	20.4	12.7

The cleaned sample is a fair one for seed, carrying 60 per cent more germinable seeds than the No. 1 Hard, but showing perhaps 60 per cent less vigor. Cleaning improved this sample very much.

NO. 6 SPECIAL



<i>Weight per Bushel...64 1-2</i>	48		
<i>Number of Seeds per Bushel in 1000's...782</i>	1779	1328	2110
<i>Per Cent Germination100</i>	(56)60	(72)72	(52)60
<i>Number of Germinable Seeds per Bushel...782</i>	1067	956	1266
<i>Weight of 1000 Kernels in Grams...34.8</i>	15.3	20.5	12.9

Too low in vigor to be risked for seed. Cleaning made a great improvement, but not enough to make it safe to sow.

NO. 4

16 days
after
Plant-
ing

9 days
after
Plant-
ing



<i>Weight per Bushel...</i>	64 1-2	60		
<i>Number of Seeds per Bushel in 1000's...</i>	782	1188	1039	1903
<i>Per Cent Germination</i>	100	(76)76	(84)84	(64)64
<i>Number of Germinable Seeds per Bushel...</i>	782	903	873	1218
<i>Weight of 1000 Kernels in Grams...</i>	34.8	22.9	26.2	14.3

Touched with frost and a little rust, but cleaning makes it a fair sample for seed.

NO. 6

16 days
after
Plant-
ing

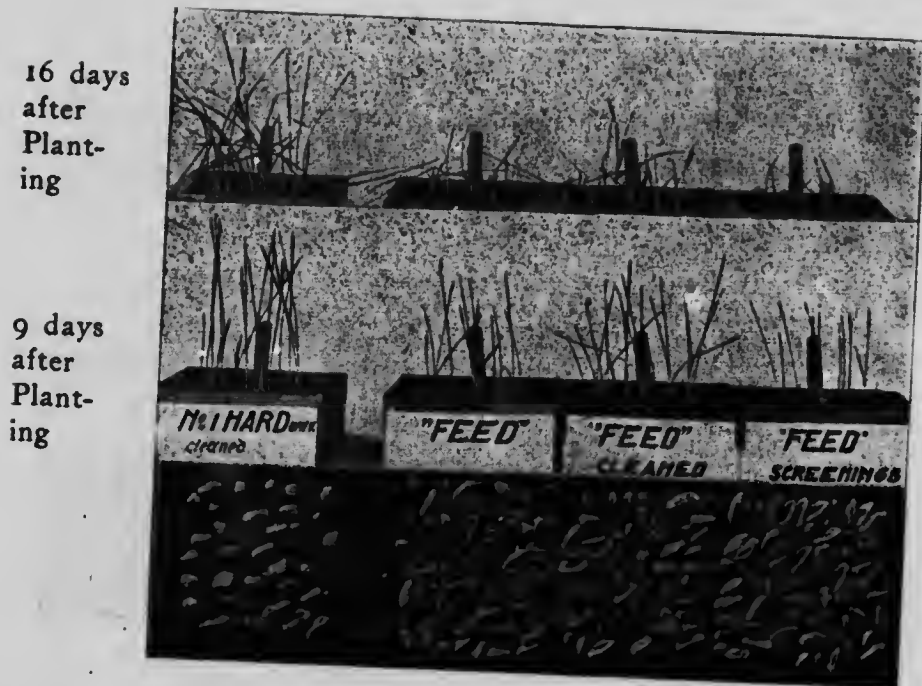
9 days
after
Plant-
ing



<i>Weight per Bushel...</i>	64 1-2	55		
<i>Number of Seeds per Bushel in 1000's...</i>	782	1243	1124	1814
<i>Per Cent Germination</i>	100	(60)64	(64)84	(32)56
<i>Number of Germinable Seeds per Bushel...</i>	782	795	944	1016
<i>Weight of 1000 Kernels in Grams.</i>	34.8	21.9	24.2	15.0

This sample was very much improved in vigor and percentage germination, as well as in total germinable seeds and vigor by cleaning. It was not a uniform sample and the best was saved by the fanning mill. A much better sample of No. 6 than the average of that grade.

FEED



<i>Weight per Bushel...</i>	64 1-2	46		
<i>Number of Seeds per Bushel in 1000's...</i>	782	2031	1610	2568
<i>Per Cent Germination</i>	100	(68)68	(92)96	(64)64
<i>Number of Germinable Seeds per Bushel...</i>	782	1381	1546	1643
<i>Weight of 1000 Kernels in Grams...</i>	34.8	13.4	16.9	10.6

A very poor sample for seed yet it contains twice as many germinable seeds per bushel as the No. 1 Hard. Notice the vigor as compared with the good sample on the left.

MISCELLANEOUS SAMPLES

16 days
after
Plant-
ing

9 days
after
Plant-
ing



Weight per Bushel... .64 1-2

Number of Seeds per

Bushel in 1000's... 782

3058

1573

1076

Per Cent Germination 100

(60)72

(56)56

(28)48

Number of Germinable

Seeds per Bushel... 782

2202

881

516

Weight of 1000

Kernels in Grams... 34.8

8.9

17.3

25.3

Marquis B is the least vigorous sample tested, yet it contains three times as many germinable seeds per acre as the best one. This was not considered worth while cutting, and is certainly unfit for seed.

Marquis W. is a very poor one for seed, yet some of the plumpest kernels produce fairly strong plants.

Frosted Marquis A. Not "frosted" but badly frozen. The photograph flatters the seed. At twice the ordinary rate it might give a full stand, but it would likely rot in the ground if the spring were backward.

SOME OBSERVATIONS ON THESE TESTS

A proportion of the rusted and frosted kernels varying with the seriousness of the injury will grow, but the percentage germination though relatively high in the rusted grain is not a safe guide to its value for seed.

The reasons for this are twofold:

1st. It is not fair to the normally developed grain, because it gives no indication of the vigor of the germination or subsequent growth and in a backward season this is of fundamental importance.

2nd. It is not fair to the injured grain because the latter contains far more seeds per measured bushel than the uninjured. Every sample of rusted seed shown here, with the exception of the badly frozen sample, contains more germinable seeds per bushel than the sample of University Grown No. 1 Hard. In fact the least valuable rusted sample reported upon (Marquis B) which germinated only 72 per cent, contains nearly three times as many germinable seeds per 60 pounds as the plumpest sample of No. 1 Hard which germinated 100 per cent. *But if it contained ten times as many germinable seeds there would be no justification for using it for seed because of its low vigor and the danger of the vitality being destroyed by untoward conditions either before or after coming up.*

The weight of the germinable seeds seems to be the safest guide to the vigor of growth. In other words the value of clean, rusted grain for seed can best be determined by a germination test at home which will show not only the percentage germination but the vigor of growth as well. The weight per bushel, the size and plumpness of the berry, and its relative freedom from injury indicate quality in seed grain but the weight of single kernels is generally the safest guide to the vigor of growth of rusted wheat.

If we were sure there would be warm weather, plenty of moisture and no killing frosts nor soil drifting between the 15th of April and the middle of June, much of this rusted seed might be used with considerable hope of success, but this "if" is beyond the expectation of most reasonable men. The facts are:—

1. That some of this injured seed will grow.
 2. That it may not be killed if ideal conditions after planting obtain, and
 3. The lower grades are likely either to fail to germinate or to die if untoward conditions such as a cold, backward spring, late frosts, and high winds prevail.
- Plants from plump, heavy seed will recover after all or any of

these conditions. The thinner and lighter the seed, the less the chance of success. The man who would lessen his chances of failure, the one who would not gamble with his crop—and in 1917 it will be a valuable stake—should plan now to test his own seed and if necessary to get from some source a supply of vigorous, germinable seed for the coming year.

Much of the best seed is moving out of the country. It may be too late next March to get a good supply. The experience of the past and the need of the present both demand quick action.

The Provincial Seed Testing Laboratory at Regina or The Dominion Seed Testing Laboratory at Calgary should be utilized to the fullest possible extent. At either of these places seeds will be tested for percentage germination free of charge.

The services of the Dominion Seed Grain Commission should be made use of by individuals or municipalities in areas where better seed is desired. Mr. A. E. Wilson of Indian Head, is the Chairman of that committee. His present address is Regina.

DOES RUSTED SEED WHEAT CARRY THE DISEASE ?

Most investigators believe that rusted seed is valuable in proportion to the amount that will grow and the vigor of the growth. These men are of the opinion that the seed does not carry the disease. But among European investigators there are some exceptions to this contention. Two among them report having found the mycelium of the disease in the seed. If this were generally true, rusted grain should not be used for seed. But other investigators and most practical men do not believe the seed is a carrier of the disease.

THREE KINDS OF SEED

There are three different kinds of clean seed this year:

1. The kind that will not grow.
2. The kind that will grow but will produce only feeble plants, and
3. The kind that will grow and produce vigorous plants.

The first is obviously unfit for seed. The germination test will tell whether it will grow or not.

The second is unfit for seed in proportion to its thinness and lack of vigor. The more lean it is and the lighter it is per bushel, the greater the risk in using it.

The third is the only kind that should be used, for the reason that it is the only kind that carries with it the least risk. Large, plump, sound kernels are the only insurance we have against backward spring conditions and killing frosts after the plants are up.

