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1951

NATIONAL OAT NEWSLETTER

Vol. II

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February 1, 1952

Sponsored by the National Oat Conference

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I. THE NATIONAL OAT CONFERENCE

A Statement on the National Oat Conference by the Chairman for 1951, T. R. Stanton

The first regular meeting of the National Oat Conference was held in connection with the meeting of the American Society of Agronomy at Cincinnati, Ohio, Nov. 2, 1950. A second meeting has not been held under the present chairman owing to the prevailing opinion that a meeting of the National Oat Conference was not warranted every year. However, the men named below have continued to function for 1951 as members of the National Oat Conference committee.

R. M. Caldwell, LaFayette, Ind.
F. A. Coffman, Beltsville, Md.
N. F. Jensen, Ithaca, N. Y.
H. C. Murphy, Ames, Iowa
K. S. Quisenberry, Beltsville, Md.
D. A. Reid, Lexington, Ky.
D. W. Robertson, Ft. Collins, Colo.
H. L. Shands, Madison, Wis.
T. R. Stanton, Beltsville, Md.

In accordance with action taken at the Cincinnati meeting I. M. Atkins was named in August 1951 on the National Committee to serve as a second member with D. A. Reid for the Southern Region. At the Northeastern Small Grain Regional Conference held at Cornell University, Ithaca, N. Y. on November 20 and 21, 1951 and reported more fully elsewhere in this number of the Newsletter, N. F. Jensen was renamed to serve on the National Committee for a period of four years and L. H. Taylor, Orono, Maine, to serve as a member of the Committee for a period of two years.

As yet, a second member from the Western Region has not been named to the National Oat Conference Committee. This should be done at an early date.

As National Chairman for 1951, I want to take this opportunity to give credit to Dr. Jensen for rendering able and outstanding service to the National Oat Conference in getting out the National Oat Newsletters for 1950 (Vol. 1) and 1951 (Vol. 2). I also want to thank the Quaker Oats Company, Chicago, Ill., for providing funds to the amount of \$250.00 for defraying the cost of the 1951 National Oat Newsletter. This is truly a token of the fine spirit of cooperation that exists between this company and the oat breeders of the United States.

On retiring from active duty in oat investigations in the Division of Cereal Crops and Diseases, I am taking this opportunity to state that through the years I have greatly enjoyed my association with all those who have been interested in the rather broad field of

oat improvement. The wonderful cooperation of agronomists, pathologists, physiologists, geneticists, cytogeneticists and other workers in the Colleges of Agriculture, State Agricultural Experiment Stations, other research institutions, and commercial Seed Breeding Companies has made possible the outstanding accomplishments in oat improvement during the past 40 years. In closing I also shall cherish through the years the pleasant associations with my immediate superiors, coordinates, cooperators, helpers and friends. Life's true values are fixed only through achievement.

* * * * *

The National Oat Conference Committee
Feb. 1, 1951 to Feb. 1, 1952

No meetings have been held by the National Oat Conference Committee as a whole since the last report on Feb. 1, 1951, but the organization has been active during the year,

In the spring of 1951, as a result of a mail ballot, T. R. Stanton was duly elected president of the National Oat Conference Committee to succeed H. L. Shands.

Several regional meetings were held during the year. At these meetings members were elected to the National Committee from the different regions, in conformity with the membership arrangements adopted by the National Committee in their meeting held at Cincinnati, Ohio, November 2, 1950.

A meeting of Southern Agronomists held in August, 1951 at State College, Penna., at the time of the meetings of the American Society of Agronomy, elected D. A. Reid, Lexington, Ky. and I. M. Atkins, Denton, Texas, to serve as committee members from the Southern Region.

In November, 1951 in a meeting of Northeastern Agronomists held at Cornell University, Ithaca, N. Y., Neal F. Jensen, Ithaca, N. Y. and Lincoln H. Taylor, Orono, Me., were elected to serve as committee members from the Northeastern Region.

In a meeting of the North Central Oat Technical Committee held Jan. 19, 1952 at the Palmer House Hotel in Chicago, H. L. Shands, Madison, Wis., H. C. Murphy, Ames, Iowa, and J. M. Poehlman, Columbia, Mo., were elected as committee members to represent the North Central Region.

As yet the Western Region has not held a meeting to elect their second representative and D. W. Robertson, Ft. Collins, Colo. is the only committee member from that region at this time,

As now constituted (Feb. 1, 1952) the membership of the National Oat Conference Committee is as follows:

<u>Region</u>	<u>Members</u>
Northeast	Neal F. Jensen Lincoln H. Taylor
North Central	J. M. Poehlman H. C. Murphy H. L. Shands
South	I. M. Atkins D. A. Reid
West	D. W. Robertson <u>1/</u>
Beltsville, Md.	K. S. Quisenberry T. R. Stanton (President) F. A. Coffman (Secretary)

1/ One member to be elected.

During the year Vol. 1, 1950 of the National Oat Newsletter was published at the expense of the Cornell University, Ithaca, N. Y. Neal F. Jensen of Cornell acted as editor. This is an excellent, informative, interesting, and attractive publication.

Publication of Vol. II of the National Oat Newsletter has been made possible by a grant from the Quaker Oat Company of Chicago, Ill. This grant will cover the cost of the publication. Neal F. Jensen of Cornell University again has agreed to act as editor.

Signed: Franklin A. Coffman, Secretary

* * * * *

Report of the Meeting of the North Central
Region Oat Technical Committee
Reported by K. J. Frey

The Oat Improvement Technical Committee for the North Central Region held its first meeting on January 19, 1952 in the Palmer House Hotel, Chicago, Illinois. Nineteen persons were in attendance representing eleven of the North Central States, the U.S.D.A., and the Quaker Oats Company. Drs. H. L. Shands, H. C. Murphy, and J. M. Poehlman were elected to serve in a dual capacity as the executive board and the representatives of this group to the National Oat Conference. Dr. Shands was also elected chairman of this group.

It was announced that three new oat varieties, Mo. O-205 from Missouri, C. I. 5869 from Iowa, and LaSalle from Illinois, are being released to farmers in the North Central States. There was a great deal of discussion about increasing and releasing varieties before they have been tested adequately. Consensus of the group is in favor of a longer testing period for new varieties before they are released. The Technical Committee voted to reestablish a uniform smut nursery for oats. Mr. Coffman is charged with this duty.

The next tentative meeting date of the Oat Technical Committee for the North Central Region is in January, 1954.

* * * * *

Report of the Northeastern Small Grains Regional Conference Reported by N. F. Jensen

A Small Grains Conference for the Northeastern states was held November 20-21, 1951 at Cornell University, Ithaca, N. Y. This Conference followed immediately after the annual Cornell Seed School with a joint session on Tuesday morning devoted to the small grains. Approximately 25 persons attended from the northeastern area and Beltsville.

Mr. Coffman and Dr. Lowther presented talks at the oat meeting Tuesday afternoon, (S. R. Aldrich, Chmn.), following which a panel discussed topics of interest in oat improvement. N. F. Jensen and L. H. Taylor were elected as representatives to the National Oat Conference Committee from the Northeastern region for 4 years and 2 years, respectively, beginning with January 1, 1952. No formal organization of the Northeastern group was concluded but it was agreed that future meetings on small grains would be desirable and N. F. Jensen was asked to contact those concerned at the proper time regarding time and place for the next meeting (probably in 1954).

II CONTRIBUTIONS - SPECIAL ARTICLES

George J. Wilds, Jr. Noted Southern Oat Breeder Dies By T. R. Stanton

George James Wilds, Jr., born at Longtown, S. C., Sept. 19, 1889, was stricken while attending the Clemson College-South Carolina University football game at Columbia, S. C., on Oct. 25, 1951 and died the next day in a Columbia hospital. He had been in ill health for two years, but for several months prior to his untimely and rather sudden passing his condition had greatly improved.

He received his A. B. degree from the University of South Carolina in 1913; the A. M. degree from Cornell University in 1917; the honorary degree of D. Sc. from Clemson College in 1937; and the honorary degree of L.L.D. from the University of South Carolina in 1946. In 1932, Dr. Wilds was awarded a testimonial for distinguished service to the agricultural development of South Carolina by Clemson College; in 1947 he was presented a Medallion of honor by the Association of Southern Agricultural Workers for outstanding service to Southern agriculture; in 1947 he also was proclaimed as "The Man of the Year" in South Carolina agriculture by the Progressive Farmer, a leading Southern farm journal; and in 1948 he was given the South Carolina American Legion Distinguished Service Award.

Dr. Wilds was a member of the American Association for the Advancement of Science, the American Society of Agronomy, The American Phytopathological Society, The Association of Southern Agricultural Workers, the South Carolina Academy of Science, and the Darlington County Agricultural Society of which he served as president for two years. He was a member of the Sigma Xi and Phi Beta Kappa honor fraternities and the Omicron Delta Kappa social fraternity. He was a Rotarian, a Mason and a Presbyterian Elder.

Dr. Wilds is survived by his widow, Mrs. Ruth Lawton Wilds, a son, Jimmy Wilds and his step mother, Mrs. George J. Wilds, Sr.

Dr. Wilds became an employee of the Coker's Pedigreed Seed Company in 1908 with whom he later served as Assistant Plant Breeder, Plant Breeder, and Director of Plant Breeding. He succeeded the late David R. Coker as president of the Company in 1939. He also was treasurer and managing director of the Company at the time of his death.

However, this story is concerned primarily with regard to Dr. Wilds as an oat breeder, although he was equally distinguished as a cotton breeder, originating several varieties that are widely grown throughout the Cotton Belt. These have contributed millions of dollars to the agricultural economy of the South. He also was a wheat breeder and did some improvement work with barley, corn, soybeans and other crops.

As an oat breeder he was one of the most intelligent, efficient, and enthusiastic workers the writer has known. Dr. Wilds early turned to hybridization to produce new strains and varieties, especially to develop smut- and crown rust-resistant winter oats for the South. The following story will give the reader some indication of his intense interest and enthusiasm regarding the possibilities of plant breeding.

In the fall of 1921, after serving the Coker Company several years, he decided to return to Cornell University and take up studies leading toward the Ph. D. degree. While on his way to Ithaca, N. Y.

to arrange for his graduate work he stopped over in Washington, D. C. and visited the writer in the Division of Cereal Crops and Diseases, U. S. Department of Agriculture to discuss oat breeding, varieties and potential thesis problems. In the course of our discussion the writer incidently mentioned Navarro, then a new and distinct morphological type of red oats with high resistance to the oat smuts that had been collected a few years previously in Texas. At the time it was believed that this oat probably would offer an ideal parent for breeding smut-resistant red oats. It also was suggested by the writer that crosses on Navarro might offer excellent genetic material for a Ph. D. thesis.

Young Wilds at once became so enthusiastic regarding the potentialities for breeding smut-resistant oats that his plans for graduate work at Cornell were abandoned; in fact, after being presented with a package of Navarro oats he returned to Hartsville and started to breed smut-resistant red oats, and later rust-resistant red oats with a zeal and enthusiasm that never abated until the day of his death.

His principal oat productions include the original smut-resistant Fulgrain, a new type of red oats that resulted from a cross between Norton 20-93 (Big Boy) and Navarro. Later by crossing Fulgrain on Victoria oats he evolved the now well-known smut- and crown rust-resistant Fulgrain strains, and a new varietal type with the same disease reactions; namely Victorgrain, of which several strains have been distributed. Of these, Victorgrain 48-93 (C. I. 5355) first placed on the market in the fall of 1950 gives every indication of being one of the best varieties ever distributed by the Coker Company. He also selected the Stanton oat from mass seed of the Lee-Victoria hybrid, made by the writer.

The early-maturing, stiff-strawed, disease-resistant red oat strains of the Fulgrain and Victorgrain types have been widely distributed in the South and thus have been among the leading red-oat types grown for a decade. The Stanton type oat has been less popular owing primarily to high susceptibility to Victoria blight and late maturity.

Space forbids further discussion of other oat varieties developed by Dr. Wilds and associates by crossing on Bond. It should be stated here, however, that the wide-spread occurrence of the destructive Victoria blight in Victoria-related oats, and the appearance of new races of crown rust such as races 45 and 57 on Bond-derived varieties were a great source of worry to Dr. Wilds during the last few years of his life.

Dr. Wilds was a believer in testing very large plant populations of the crosses being exploited. Hence, the growing of 40,000 to 50,000 nursery rows of oats annually was not uncommon at Hartsville. His method of testing strains of oats for resistance to smut is of

special interest. The hulls were removed from the groats by running the seed through a small thresher and then floating the hulls off in water. The dry smut spores were applied to the seed, which usually was sown in 15-foot rows at about normal rates of seeding. As a rule, heavy infections with a consequent efficient evaluation of the relative smut resistance of the various breeding strains and check varieties were obtained.

In conclusion, a word should be said regarding Dr. Wilds, the man. He was of Scotch ancestry and possessed many of the fine attributes of that hardy clan. He was truly the friend of man; his inspired civic leadership, genial personality, wide sympathy, broad outlook, great executive ability and outstanding achievement in the field of agriculture made him one of the best known and most beloved men of the South.

* * * * *

A Pioneer Oat Agronomist Passes Away By W. H. Chapman

J. D. Warner, Vice Director in Charge of the North Florida Experiment Station, passed away on November 17, 1951 at the age of 52 years. A brief statement concerning his achievements in oat breeding should be of interest to those who will receive the Newsletter.

Mr. Warner was transferred from the Main Station to Quincy in August 1933 and conducted field crop investigations until he was placed in charge of the Station in 1939. During his tenure of service as Agronomist he organized and supervised the oat breeding project as well as early work on the establishment and maintenance of improved pastures.

During the early years crown rust was the limiting factor in the production of oats in the Gulf Coast region. However, Mr. Warner felt that through a scientific breeding program these diseases could be overcome and the farmers of Northwest Florida could grow oats profitably. His enthusiasm for oat breeding was at its highest at the time the red oat selections from Victoria crosses were in early tests. These crosses gave rise to Quincy Red, Quincy Gray, and Florilee. As a result of the release of these varieties, oat acreage increased rapidly and the importance of this crop as a source of grain and winter grazing to meet the needs of increased livestock production was realized. The sudden and severe outbreak of Victoria blight and crown rust in 1948 did not lessen his belief that a sound breeding program would furnish new and more disease resistant varieties.

Although Mr. Warner was best known for his contributions to Southern Agriculture through his early work with field crops and pastures, he will be remembered as a man who could render a practical

application of research findings to the farmers' need. By adhering to the principles of hard work, sound judgment, and close observation he acquired a vast knowledge of agricultural findings which were paramount in the betterment of Southern Agriculture. Under his direction the North Florida Experiment Station became one of the outstanding units of the Florida Agricultural System.

The qualities he exemplified will influence the policies of the Southern farmer for many years and those who were closely associated with him will always remember his wise and friendly counsel.

(The following paragraphs regarding Mr. J. D. Warner's work as an oat breeder have been appended to Mr. Chapman's statement by T. R. Stanton):

During the period Mr. Warner was engaged in actual oat breeding at the North Florida Experiment Station, Quincy, he showed marked ability and judgment in selecting and testing disease-resistant breeding lines and other oats, several of which gave rise to the then promising new varieties, Quincy Red, Quincy Gray and Florilee, mentioned by Mr. Chapman as Mr. Warner's principal productions.

He was one of a small group of Southern agronomists who believed that if varieties could be introduced or developed with protective resistance to crown rust, oat production could be made fairly successful in the lower South where severe epidemics of the oat rusts, especially crown rust, occur nearly every year. This belief became a reality by the distribution and excellent performance on North Florida farms of the new varieties developed by Mr. Warner, at least until their usefulness was greatly impaired by Victoria blight.

It was the writer's good fortune to occasionally visit Mr. Warner officially at Quincy during the period he was rather intensively engaged in oat breeding. He used modern nursery designs and subjected his data to statistical analysis. As previously indicated he was able to make much progress in breeding for resistance to the then prevalent races of crown rust as heavy natural epidemics of this disease occurred nearly every year, and consequently a very rapid elimination of the susceptible lines was possible. At that time the Victoria type of crown rust resistance afforded a protection to oats not hitherto available in the Gulf Coast area and its discovery marked the beginning of a new era in oat breeding. Hence, it was definitely demonstrated beyond doubt that crown rust infection was truly the decisive limiting factor in oat production in this area. Bond derivatives distributed later gave protection against Victoria blight, but in turn succumbed to races 45, 57 and similar races of crown rust. These again in turn were followed by Camellia and Southland, varieties with some resistance to the new crown rust races.

If oat breeding in the South is continued in the hands of men with the ideals, abilities, and enthusiasms of Mr. Warner, Dr. Wilds and others the writer believes that new varieties will be de-

veloped and distributed to meet each and every threat of new diseases, or new races of old diseases that may arise.

Mr. Warner was a native of South Carolina and a graduate of Clemson College. He was a man of high ideals, excellent personality and greatly admired by his coworkers and friends. He was truly a friend of man and a benefactor to Southern agriculture.

* * * * *

What to Expect in Oat Breeding Within the Next Few Years?

By T. R. Stanton

Several oat breeders have suggested that I prepare a statement for the 1951 National Oat Newsletter on the above topic. Barring the event of the occurrence of an unexpected destructive new disease such as was true of Victoria blight, oat breeding will continue along the lines followed in recent years; that is in the development of satisfactory resistance to the newer and more threatening races of both crown and stem rust.

In my judgment the problem of breeding new strains of both spring and winter oats resistant to races 45, 57 and similar races of crown rust is well on the way toward solution. Numerous resistant and promising agronomic lines are being tested at many stations and some already are being increased. Santa Fe, Landhafer, and Trispermia, introduced varieties, have furnished satisfactory germ plasm for resistance to the newer races of crown rust.

Furthermore, it now appears that efforts will be concentrated on the maintenance of the very desirable agronomic characters, such as the stiff straw, high-test weights, etc., found in Bond and its derivatives in the new strains resistant to crown rust race 45, etc. Before Clinton became widely distributed and one of the most extensively grown varieties in the United States, the prediction was made that this variety because of its greatly superior standing ability would become exceedingly popular among farmers, even if the average yield was not as high as that of some other disease-resistant varieties. This forecast has been more than fulfilled. Hence, the great importance of a stiff straw must not be overlooked in future breeding work.

With regard to breeding for resistance to races 6, 7, and 8 of stem rust there is some doubt as to whether these races offer nearly as serious a threat to the oat crop as does crown rust races 45, 57 and similar races.

Satisfactory resistance to the races of stem rust has been found in Canuck and other related Hajira-Joanette strains developed by oat breeders in Canada. Already numerous breeding strains have

become available for testing that carry this so-called Canadian resistance. As a result, it is believed that new varieties will be forthcoming within the next few years with a combination of resistance to all the economically important races of both crown and stem rust.

The development of strains with a satisfactory combination of resistance to races 6, 7, and 8 of stem rust and to the economically important races of crown rust may not be achieved immediately. However, new oats with desirable plant and grain characters having this combination of rust resistance should ultimately become available.

The only fly in the ointment is the probability of the occurrence of still newer or previously unknown virulent races of the oat rusts. Nevertheless, this writer believes that a period in which the occurrence of new races will subside at least to some extent may be at hand.

Virtually all the oat varieties now grown in the United States carry smut-resistant germ plasm. A few new races have appeared but these have not been especially troublesome. In the spring oat regions smutted panicles are difficult to find in most oat fields. The scarcity of natural infection is indicated by the fact that breeders are now producing their own spores for experimental work on their respective stations. In the South, however, where a considerable acreage of oats of the old Red Rustproof variety is still grown some smut-infected panicles may be found in most fields. This infection has never been especially heavy because it has been known for years that this type of oats has resistance to many races of the oat smuts, especially those attacking northern common or white oats. Varieties of fall-sown oats carrying Victoria and Bond germ plasm have been for the most part rather uniformly resistant to the oat smuts.

Regarding other diseases some work has been done on the mosaics (viruses) of winter oats that have appeared in the Carolinas, Georgia, and Alabama. Fortunately it has been demonstrated that numerous resistant varieties are available and until such time when mosaics may become more prevalent in widely distributed fields of fall-sown oats the problem cannot be rated otherwise than as a minor one.

The so-called "red leaf" troubles are still with us and the development of corrective measures is pertinent. It now appears that most of the reddening of the leaves of oats, especially in cold, late seasons is due to excessive soil moisture, lack of nitrogen, or other major plant nutrients, or perhaps to trace or minor element deficiencies. It is admitted that yellowing in some varieties is genetic, especially chlorophyll deficiencies, etc.

Evidently certain varieties are more quickly affected by these soil and malnutritional factors than are others. These varieties should be determined and discarded. It is now apparent that a combination of various deleterious factors results in malnutrition and arrested growth of the oat plant. As a consequence, more intensive basic research to determine the causes of "red leaf" should be undertaken, looking toward the development of methods of control.

Breeding for improved agronomic characters of course should go hand in hand with breeding for disease resistance. No matter how completely disease-resistant a new variety may be, if unproductive, low in grain quality, and weak-strawed, it will be of little agronomic value. In the Old World, especially in northern Europe where diseases are of very minor importance, improvement of these major desirable agronomic characteristics is still the prime objective of oat breeding.

Finally the bringing together of disease-resistant germ plasm from widely divergent and exotic sources started on a larger scale a few years ago should be continued. Likewise as much of this material as possible should be tested and definitely catalogued for any specific disease resistance or desirable agronomic characteristics for future reference and use.

Since there is no such thing as a perfect oat variety, and probably never will be, there are still great opportunities for the improvement of oats through the breeding of better varieties. More emphasis also should be given to the development of varieties, especially winter oat varieties, with superior grazing characteristics. Likewise hardier varieties for fall seeding are needed, especially for the more northern parts of the winter oat belt of the South. Breeding for greater winter resistance is a long time project that must be continued from one generation of breeders to another if tangible results are to be obtained.

* * * * *

Some Observations on Oats in 1951 By Franklin A. Coffman

During the crop year of 1951 the writer visited State Experiment Stations in Maryland, Florida, Georgia, North Carolina, New Jersey, Ohio, Iowa, Wisconsin, North Dakota, Montana, Idaho, Wyoming, Kansas and Ithaca, N. Y. was visited in November. The following crop conditions were observed:

1. The winter of 1950-51 was so rigorous that winter killing of oats was severe in most areas of the South. In Georgia this was especially true although a reduction in stands was noted in Florida,

North Carolina, Virginia, Maryland, and New Jersey.

2. Owing to late spring snows, excessive rains and floods in the spring, especially in the southern part of the Corn Belt Region, the oat acreage was below normal and the crop was backward. In the more northern areas seeding of oats was completed more nearly on time.

3. Infection by crown rust, (presumably races 45 and 57 and similar races) was noted in many places but centers of infection were rather local in nature and injury was comparatively slight.

4. Stem rust was not a problem in 1951. Infection was slight as cool weather retarded production of rust spores and the excessive rains apparently washed the spores to the ground about as fast as they were produced. The result was fortunate in that local centers of infection remained local.

5. As a result of cool moist weather throughout the season the late seeded oats were not subjected to the climatic conditions usually experienced in July and August; hot, dry weather. This cool weather permitted the oats to develop normally and excellent yields of good quality grain resulted almost everywhere.

6. At the time the writer crossed the Corn Belt Region (early July) little "red leaf" was noticed and H. victoriae only in the few susceptible entries in uniform nurseries. Oats at that time had grown unusually tall and considerable lodging was noted especially in the lower areas of many fields. In general, however, the crop, although late, appeared in good condition.

7. Data now summarized indicate the top-yielding oats in uniform nurseries conducted to the east of the Rocky Mountains in 1951 were as follows:

(1) Spring Sown Nurseries

<u>Yield</u> <u>Rank</u>	<u>Variety or</u> <u>C. I. No. 1/</u>	<u>Yield</u> <u>Bu.</u>	<u>Test</u> <u>Lb.</u>	<u>Lodging</u> <u>%</u>
Midseason Nursery (16 stations) ^{2/}				
1	Ajax	79.3	33.1	33.0
2	4267	78.4	31.2	33.6
3	5941	77.6	33.1	35.7
4	Craig	76.6	32.8	31.5
5	5441	76.4	35.2	27.5
Early Maturing Nursery (18 stations)				
1	4988	78.0	34.7	31.6
2	5859	77.8	32.8	34.5
3	5951	77.1	32.7	25.8
4	5648	75.9	34.7	29.6
5	Andrew	75.2	33.5	36.5

(Continued on next page)

Spring Sown Red Oat Nursery (9 Eastern stations)

1	5323	68.3	33.2	13.3
2	5697	68.3	29.5	19.6
3	5864	67.5	32.0	23.0
4	4988	66.6	33.1	18.5
5	5320 & 4674	66.3	33.2 & 30.6	15.5 & 47.4

Spring Sown Red Oat Nursery (5 Western stations)

1	4674	69.2	30.6	47.4
2	4673	67.2	31.3	42.2
3	4988	62.8	33.1	18.5
4	5697	61.8	29.5	19.6
5	4672	60.0	30.7	38.5

(2) Fall Sown Nurseries

<u>Yield Rank</u>	<u>Variety or C. I. No. 1/</u>	<u>Yield Bu.</u>	<u>Test Lbs.</u>	<u>Lodging Pct.</u>	<u>Survival Pct.</u>	<u>Forage Pct. 3/</u>
Special Winter Hardy Nursery (12 stations) 2/						
1	4829	56.0	32.9	27.6	63.4	99.5
2	Fulwin	55.7	34.2	24.4	63.3	102.0
3	5106	53.3	33.7	4.2	64.1	103.8
4	Wintok	50.4	35.2	18.2	69.2	97.5
5	Forkedeer	49.2	35.6	13.8	58.7	101.8
Uniform Fall Sown Nursery (9 Northern stations)						
1	Arlington	76.6	34.5	12.9	74.9	121.8
2	Atlantic	73.6	34.3	35.2	80.8	122.6
3	5874	73.4	34.0	44.1	83.8	118.4
4	Mustang	70.5	33.9	17.8	76.7	116.6
5	Coy	70.1	34.3	16.9	80.8	121.7
Uniform Fall Sown Nursery (8 Southern stations)						
1	Victorgrain	67.7	34.1	8.2	70.7	113.9
2	DeSoto	66.1	33.5	32.6	72.1	111.1
3	Atlantic	66.0	34.3	35.2	80.8	122.6
4	Letoria	61.9	32.8	9.7	74.8	113.3
5	Mustang	60.7	33.9	17.8	76.7	116.6
Florida-Gulf Coast Nursery 4/ (8 stations)						
1	Appler (Check)	69.8	29.0	28.4	61.7	100.0
2	5492	51.1	31.5	5.0	49.4	90.2
3	5569	46.9	24.0	54.9	62.4	122.7
4	5918	46.5	29.3	26.4	41.1	80.2
5	5925	41.7	32.0	39.4	61.8	109.6

1/ Key to the Parents and Source of Strains Designated Only by C. I. NumbersSpring Sown Oats

C. I. No. 4267=Anthony x Morota, USDA-Oreg-Iowa; C. I. 5941=Clinton x (Boone-Cartier) Ind.; C. I. Nos. 5441 and 5648=Sister strains

Clinton x Marion, USDA-Ida.-Iowa; C. I. Nos. 4988 and 5323= Sister strains now both are designated Mo. 0-205, Mo.; C. I. Nos. 5859 and 5851=backcrosses Santa Fe x Clinton, Iowa-USDA; C. I. 5697=Andrew x Landhafer, USDA-Ida.; C. I. 5864=Clinton x Landhafer, Iowa-USDA; C. I. 5320=Fulton x Clinton, USDA-Ida.-Kans.; and C. I. Nos. 4672, 4673 and 4674=Sister strains (Anthony x Bond) x (Richland x Fulghum), Kans.

Fall Sown Oats

C. I. Nos. 4829 and 5106=Selections from the bulked progeny of winter oat hybrids, Okla.; C. I. No. 5874=FULWIN x (D69-Bond), Tex.-USDA-Iowa; C. I. Nos. 5492 and 5925=Atlantic x (Clinton² x Santa Fe), USDA-Ida.; C. I. No. 5569=Carolina Red x (Clinton² x Santa Fe), USDA-Ida.; C. I. No. 5918=Mindo x Landhafer, Fla.-Iowa-USDA.

- 2/ Number of stations shown indicates the greatest number reporting on the experiment. Except for yield data usually fewer stations reported than these numbers indicate.
- 3/ Based on check=100 percent: in special nursery Lee was used as check whereas Applier was used as check in the other two nurseries.
- 4/ A preliminary nursery grown for first time in 1951.

8. For the benefit of those desiring to make oat crosses in 1952, the data apparently indicate the following:

(1) Spring Oats

(A) That among spring oats the varieties Andrew, Ajax, Mo. 0-205 (C. I. 4988) and the weak strawed entries C. I. Nos. 4672, 4673 and 4674 remain the highest yielding of the older strains whereas among newer entries the sister strains, C. I. Nos. 5441 and 5648 and certain Santa Fe x Clinton backcrosses have high yield potential. Andrew's average yield for the 171 tests conducted over the past ten years exceeds 70 bushels per acre.

(B) In test weight older varieties such as Bonda, Clinton, Shelby and Andrew are about as good as the newer entries although Mo. 0-205 and Clinton x Marion C. I. Nos. 5441, 5648 rank high in this respect. Most of the Landhafer and Santa Fe derivatives do not have exceptionally heavy grain.

(C) For straw strength Clinton and its derivatives apparently remain the best source of straw strength among spring oats grown east of the Rockies whereas Overland and its derivatives lead in western irrigated areas. A few Clinton-Overland backcrosses have really exceptional straw.

(D) For earliness Andrew, Cherokee and Fulton continue the most promising source among high yielding spring sown oats, whereas Craig, Huron and C. I. No. 4267 might be mentioned as high yielding oats having midseason maturity.

(2) Winter Oats

(A) Among oats for Fall seeding, Arlington is outstanding in yield capacity. Others that should be mentioned on the basis of 1951 data are Victorgrain, Atlantic, Appller, Fulwin and C. I. Nos. 5106 and 4829.

(B) The most hardy winter oat available remains Wintok although, because of its very weak straw other sources of hardiness that should be mentioned include Fulwin, Tennex, Mustang, LeConte and C. I. Nos. 5368, 5369 and 5364.

(C) In 1951 test weights of most fall sown oats were good although Forkeddeer, Wintok, Arlington, Atlantic, Victorgrain and in the Gulf area C. I. 5492 appeared a little the best.

(D) As to standing ability, data received from only a few stations in each case indicate that C. I. No. 5106, Victorgrain, Letoria and C. I. 5492 were outstanding in this respect in 1951.

(E) Observations on forage value apparently indicate that among the higher yielding entries the sister strains, Atlantic, Arlington, and Coy, and C. I. Nos. 5874 and 5569 appeared most productive.

(F) Among fall sown oats tested Delair remains the earliest entry but the comparatively early, hardy, stiff strawed oat C. I. No. 5106 and Victorgrain would appear worthy of consideration as early parents.

III CONTRIBUTIONS FROM CANADA

Dominion Laboratory of Cereal Breeding, Winnipeg, Canada
By J. N. Welsh

Oats were little affected by rust in Western Canada in 1951. Of the races identified, 7 and 8 of stem rust and 34, 45 and 57 of crown rust were prevalent according to Dr. T. Johnson and Mr. B. Peturson pathologists in charge of race identification at the Winnipeg Laboratory. It should be mentioned that the plant breeding work is carried on with the co-operation of the plant pathologists at Winnipeg.

In the hybrid nursery at Winnipeg, where the artificially induced epidemic included all races of stem rust and crown rust, excellent infections of both diseases were obtained. In addition, a number of F4 and later generation lines, as well as a number of standard varieties and foreign introductions, were artificially inoculated with a mixture of races of both smuts. A heavy natural infection of halo blight was also present.

A number of F4 lines were selected from the cross Santa Fe x RL. 1942 that were resistant to all four diseases in the field. RL. 1942 is resistant to smut and to all races of stem rust. As a further check on their resistance the most promising of these lines are to be tested in the greenhouse for their reaction to the different races of stem rust and crown rust. F3 populations of Landhafer and Trispermia crossed with higher yielding stem rust and smut resistant varieties were also grown in the rust nursery. The best of the above lines, from the standpoint of disease resistance, will be used in crosses with the higher yielding standard varieties.

As it will be some time before varieties possessing the Santa Fe, Landhafer or Trispermia resistance to crown rust will be available for distribution in Canada other sources of resistance to this disease will have to be relied upon for the present. Studies at Winnipeg have shown that it is possible to select from crosses of Victoria parentage, lines that are resistant to Victoria blight and to approximately half of the races of crown rust that have been identified in Canada. Resistance to races 1, 4, 5 and 57 for example is linked with susceptibility to Victoria blight, whereas the resistance to races 2, 3, 34 and 45, among others, is independent of the reaction to that disease.

Several superior yielding lines were selected from Garry that are resistant to Victoria blight and to the race 45 group of races. Lines with similar resistance were selected from a cross between RL. 1574 and Roxton. In the disease nursery such lines usually carry from 15 to 30 percent crown rust infection in comparison to 75 to 85 percent for varieties with the Bond type resistance. These lines are also resistant to all races of stem rust, with the majority of them being resistant to smut.

It is possible that one of the Garry selections will replace the original variety in commerce and that one of the lines (RL. 2123) from the RL. 1574 x Roxton cross will be distributed as a new variety. Both of them are in the late maturing class.

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Cereal Division, Central Experimental Farm, Ottawa, Canada
By R. A. Derick & F. J. Zillinsky

Oat variety recommendations in Eastern Canada in 1951 were, in general, unchanged. The varieties Beaver, Erban and Ajax were the most popular among growers in Ontario, New Brunswick and Nova Scotia. In Quebec, the varieties Banner and Cartier and to a lesser extent Vanguard and Ajax, were more extensively grown. The new variety Abegweit has spread very rapidly in Prince Edward Island and in 1951 was the most popular variety grown. Indications are that a new strain of this variety, seed of which will be used for foundation stock, will outyield other varieties in the Maritimes and in parts of Quebec and Ontario. Considerable quantities of Beaver and more recently some Abegweit have been exported to the United States from Ontario. Some excellent reports on the new variety Lanark were received from growers in eastern Ontario in 1951. The indications are that this variety may be particularly useful as a combine oat.

There was a noticeable change in the prevalence of diseases from the previous season in Eastern Canada. The rusts were not a serious factor except in a few local areas. Races 8, 10 and 11 of stem rust were the most prevalent in 1951. This is a substantial increase of races 10 and 11 and a decrease in races 2 and 7. A similar change in the prevalence of crown rust races was noted. Last year's most common races 34, 45 and 57 were to a large extent replaced by races 2 and 3. The "red leaf" condition in oats which was responsible for so much concern throughout Eastern Canada in 1950 failed to show up in any appreciable amounts in 1951. A marked increase in the severity of Septoria avenae, the organism causing a leaf blotch and culm rot in oats was apparent. This disease was responsible for much premature lodging, reduced yields and lower grades in eastern Ontario. More information on genetic stocks with good resistance to this disease is needed before a definite breeding program for culm rot resistance can be lined up.

The severe lodging conditions which prevailed during the past growing season emphasizes the need for greater lodging resistance in our oat hybrids. Crosses such as 4274 (Ardri x Clinton) and 4369 (Ardri x Beacon) x Laurel which were made specifically for this purpose, were on the whole unable to withstand the severe lodging conditions at Ottawa in 1951. It is of interest to note, however, that some selections from a hulless cross 3932 (Beacon x Laurel) stood up extremely well. The same selections outyielded our best hulless varieties by as much as 20 percent over a 3 year period of testing. Because this cross lacks smut resistance it will be suitable only as a genetic stock.

Among the hybrids made specifically for crown rust resistance, those having Santa Fe, Landhafer, Klein and Mutica Ukraine are the most promising from the standpoint of rust resistance.

However, these hybrids are all agronomically unsatisfactory and are now being used as parental material. Hybrids more promising agronomically but having slightly less crown rust resistance are now being tested at several stations in Eastern Canada. Selections from one of these crosses 4367 (Beaver x Garry) x Clinton are being more widely distributed for observation and testing. A special effort is being made, using Eagle as a backcross parent, to develop lodging resistant varieties adapted to areas in central Alberta and the Lower Fraser Valley of British Columbia.

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Macdonald College (McGill University), P. Quebec, Canada
By Emile Lods

The oat project at Macdonald College (McGill University) has as one of its main objectives the developing of varieties otherwise acceptable which produce grain with a low percentage of hull. This objective has been reasonably well attained. The Cartier, the first released, is still well liked in those areas where an early maturing variety having no resistance to rust is useful. The Mabel, also early, is superior to the Cartier in yielding ability, resistance to crown rust, and produces a grain slightly but not materially lower in hull content. However, it is one of those varieties which in the plots at the experimental stations and in supplementary tests demonstrated apparent superiority, but which for some reason has not been popular. The third variety released is the Roxton. This is the most productive of the oat varieties recommended in Quebec. The grain has a hull content of 22 to 23.5 per cent under conditions where grain of Ajax and Banner has 28.5 to 30 per cent hull. Though long, the straw is stronger than that of most varieties. Where a late maturing variety (Banner and Victory maturity) is not objectionable, the Roxton is really useful. This variety has resistance to most of the forms of stem and crown rust commonly found in Quebec. Some stem rust is found in very late crops in some seasons.

At present the project is conducted to combine disease resistance in early, medium and late varieties with the type of vigor and yielding ability found in the older varieties known to be readily adapted in eastern Canada.

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IV CONTRIBUTIONS FROM USDA AND STATES

ARKANSAS

By H. R. Rosen (Fayetteville).

The fall and winter of 1950-51 afforded excellent opportunity for testing some 1924 selections and varieties for winter hardiness. Likewise, an excellent test was obtained for crown rust resistance, mainly race 45 and its related races, particularly for those selections that were sown early in September.

With abundant rainfall during the summer of 1950, volunteer oats came up thickly and were heavily rusted with crown rust throughout most of the State. With a few rains falling in the first two-thirds of September, crown rust spread with great abundance, apparently from nearby volunteer plants, and created one of the worst fall epidemics that has been observed in the past 30 years or more. Hardly any variety or selection that was sown before the middle of September escaped infection, although there was considerable variation in the amount of rust, depending largely upon the degree of resistance or escaping qualities possessed by the different numbers.

By the end of October, such susceptible varieties as Lee, Taggart, Fulwin, Tennex, and Forkeddeer showed fully 80% of the leaf area infected. Even Red Rustproof strains were so badly rusted that relatively large commercial fields of these strains presented a sickly yellow appearance at a distance, with hardly any green noticeable. As has been noted in the Arkansas oat disease report of 1949-50, in the Plant Disease Reporter, there are now races or biotypes of race 45, as well as the new race 101, to which the Red Rustproofs do not show the rust-escaping qualities which they show to race 1 or to any of the older races of crown rust. Since Red Rustproofs constitute a considerable part of the southern oat acreage, it is obvious that we in the South are facing a problem of increasing menace as these newer races increase in prevalence.

Following a rather severe 1950-51 winter, all varieties and selections that were heavily rusted in the previous fall, suffered close to 100% winter killing, irrespective of the inherent hardiness of any one variety.

One variety which came through and topped all yields in the main varietal test at the University Farm, Fayetteville, was a Bond derivative of the following parentage: Tenn. 1922 x (Bond-Iogold). It has been released very recently and named Arkwin (C.I. 5850). While it showed some rust in the fall, the amount was considerably

less than on other Bond derivatives. However, since the fall epidemic consisted almost wholly of race 45 biotypes, with only a sprinkling of race 101, there is no good evidence that it will escape infections to the latter, and artificial inoculations in the greenhouse as well as hypodermic injections outdoors seemingly demonstrate that it is fully susceptible.

It may well be that since Arkwin possesses some degree of resistance and escaping qualities to races 45, it will act as a differential incubator for the new race 101, especially if it were grown in any large contiguous acreage. Due notice is hereby given to all oat researchers to take full cognizance of this possibility. The only ones who may have a legitimate interest in this oat are the neighboring eastern Oklahoma, southern Missouri, and possibly the hilly areas in Tennessee. Since this is a winter oat requiring considerable cold weather to do its best, with a winter hardiness approaching that of Fulwin, Tennex, and Forkeddeer, it is probably not adapted to the warmer parts of the South. Likewise, it is obviously of little value as a spring oat. Even in Arkansas, we are as far as possible attempting to limit its distribution to those localities where oats are grown mainly for winter pasture and where other varieties have not done well.

It is not considered as a substitute for Traveler, Victor-grain, or DeSoto, except where there is need for sowing early to insure good fall and winter growth and where *Helminthosporium* blight may be a hazard.

Turning to the winter hardiness test uncomplicated by crown rust infection because of late seeding, there were included 1490 numbers from the Bureau of Plant Introduction. These represented many old varieties of U. S. origin, as well as comparatively new introductions from various parts of the world, including Turkey, Holland, France, India, Alaska, Austria, and Yugoslavia.

Out of the 1490 numbers, there were only 44 with 50% or more survival. Of this 44, only 8 were foreign. There were 13 numbers which showed a survival of 90% or better, and of these only two were foreign (France). These two are Z-45-Cignee G4-R.48 (P.I. 174520), and Pregriver-R.48 (P.I. 174531), and these should be further studied as a source of new germ plasm for winter hardiness, although there were no good indications that they were any hardier than a number of oats of American origin. So far as these 1490 numbers are concerned, representing perhaps less than half of the world collection, it appears that we in America have more and probably better winter hardy oats than can be found in any other country.

It should be noted that the minimum temperature to which these oats were subjected was - 8° F., which came when there was 2.6 inches of sleet and snow.

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CALIFORNIA

By C. A. Suneson & C. W. Schaller (Davis).

Below average yields of oats were common throughout California in 1951. These resulted in part from "a new virus disease of cereals, transmissible by aphids" reported by Oswald and Houston in Plant Disease Reporter 35, November 15, 1951. This virus disease attacks Red Rustproof types much more severely than Fulghum. The name "yellow-dwarf" characterizes the disease on barley, but on oats reddening of leaves and dwarfing are basic.

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COLORADO

By T. E. Haus (Ft. Collins).

Acreage of oats harvested in Colorado has remained static for the past 10 years at about 200,000 acres. Approximately one-half the annual acreage is produced under irrigated conditions and one-half under non-irrigated conditions.

The principal varieties grown under dryland conditions are Brunker and Fulton. Colorado 37 continues to be the most popular variety grown under irrigation. There is a demand for a variety which will stand for combine harvesting. Both Clinton and Vicland are being used for this purpose, mostly as a companion crop in alfalfa seeding. None of the rust-resistant varieties so far developed has consistently outyielded Colorado 37 in variety tests.

Smut is the most serious disease observed in the state. Occasionally rust is found but it is only a minor problem.

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CONNECTICUT

By B. A. Brown (Storrs).

For several years, Clinton oats has been used as a "guinea pig" crop at the Storrs Experiment Station to measure minor element deficiencies in some common Connecticut soils. When such soils are heavily limed (above pH 7.0), without additional manganese, symptoms of manganese deficiency and reduced growth occurred on five of ten soils so far included in the project. On two soils, heavy liming decreased growth even when manganese was applied to the cultures.

On one soil (Windsor sand), oats showed a significant response to copper, a highly significant response to zinc with manganese, and a significant interaction of zinc plus manganese on copper.

On another moderately limed soil (Charlton fine sandy loam), oats responded significantly to each of the three minor elements: manganese, copper and zinc.

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FLORIDA

By D. D. Morey & R. W. Earhart (Gainesville).

We wish to take this opportunity to invite interested plant breeders and pathologists to the Southern Small Grain Conference. These meetings will be held in Gainesville and Quincy, Florida March 26, 27, and 28, 1952. The technical committee for regional project S-13 will meet at the same time. We believe that small grain plantings will be at the optimum stage to show differences in diseases, maturity and other characters at that time. The program committee for the Southern region will soon have a detailed program for these meetings.

During 1951 major emphasis was placed on testing oat varieties and selections to culm rot (Helminthosporium sp.). Some 1888 lines of oats were tested in replicated greenhouse trials. About one-third of the lines tested were on a wide regional basis, while the other two-thirds were from crosses adapted primarily to the Southern Coastal Plain area. Only 0.6 per cent of all plants tested were found to be highly resistant to culm rot, 25 per cent were resistant, 41 per cent were susceptible and slightly over 33 per cent were highly susceptible to culm rot. These tests involved several common varieties of oats, and lines from about eighty different hybrid combinations from Florida and the U. S. Department of Agriculture.

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By W. H. Chapman (Quincy).

In May 1951, a questionnaire was mailed to all growers purchasing Southland oat seed from the Florida Experiment Station. Answers were received representing 42% of the approximately 10,000 bushels distributed. A large majority of these growers rated this variety superior for both grain and grazing. A summary of the questionnaires shows that the 2500 acres represented, produced yields as high as 85 bushels per acre with an average yield of 44 bushels per acre. The variety together with better than average cultural practices probably accounts for this high yield. It was interesting to note how closely the growers followed the Station recommendations printed on back of the Foundation tag.

Because of its past performance a large majority of the oat acreage in Florida is planted in Southland. Such a condition renders the oat crop extremely vulnerable to a single disease and for this reason new selections are being tested and increased for possible distribution. A selection from the cross of Florida 167 x Landhafer is being considered for possible release in 1952. This selection is 3 weeks earlier than Southland, highly resistant to crown rust and Victoria blight, and has produced good yields in preliminary trials. Even though the kernel quality is poor, a variety which is unrelated to Southland and has added earliness and crown rust resistance would tend to stabilize oat production in Florida.

Severe cold weather last season caused erratic winter killing in the nursery and indicated a need for more winter hardy material in the breeding program. The extreme cold winter together with a heavy artificially created epidemic of crown rust furnished excellent opportunities for selection in a large F₂ population.

In 1951 a large number of crosses were made to broaden the germ plasm base for crown rust resistance and combine these factors with resistance to prevalent races of stem rust, Victoria blight, and culm rot. By growing a summer crop at Aberdeen a large block of very promising F₂ material is growing this season.

Large numbers of oats and wheat from the world collections were planted in cooperation with the U.S.D.A. in a search for new sources of disease resistance.

Experiments involving rates and dates of seeding, length of grazing and its effect on forage and grain yields, and effect of nitrogen on forage and grain production were started during the season. More extensive work on how to obtain maximum production of grain and forage from the new disease resistant varieties is needed.

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GEORGIA

By A. R. Brown (Athens).

The Southeast had a very poor year due to a cold winter. The Uniform Fall Sown Oat Nursery was not replanted in the Spring of 1951 so I have no data on that particular nursery. The Georgia Uniform Nursery was replanted at Athens on February 28, 1951 and here are a few yield results:

<u>Variety</u>	<u>Bu/A (Av. of 4 reps.)</u>
Arlington	28.8
Atlantic	32.6
Victorgrain	34.8
Fulgrain 1950 BRS	36.3
Southland	37.5

A drought in May hurt the yield of all varieties but was especially detrimental to the late-heading Red Rustproof types as their average yield was about 17 bushels per acre. Maybe Southland and Fulgrain can be successfully planted in the Spring if winter-killed?

This past Fall (1951) was ideal for the growth of oats. We did have a hard freeze on December 16, 1951, with the temperature dropping to 11° F. and several of the stands of the more tender varieties of the Uniform Fall Sown Nursery were reduced. Some of the winter survival readings follow:

<u>Variety or Selection</u>	<u>% of winter survival (av. of 3 reps.)</u>
Appler	95
Arlington	98
Atlantic	100
Mustang	93
Arkwin	100
Fulwin x (D69-Bond) Tex Sel 120-46-20	100
C.I. 65-74	77
C.I. 53-71	82
Southland	62
Fla. 167 x Landhafer: Sel 2213	78
Delair	90
Ga H 842	100
Nortex 0112	93
Trispermia x (Clinton 2-S.Fe): Sel 2819-1	87
" " " " " -3	77
Appler x Trelle Dwarf Sel 24893	88

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By U. R. Gore & H. B. Harris (Experiment).

After the fall sown oat nursery froze out, spring plantings were made, excellent yields obtained. The generally cool spring kept rust and mildew to a minimum.

and

A three-row belt type nursery seeder, mounted on a Farmall Cub tractor designed to plant rod row plots, was built. Very uniform stands were secured with this planter the past season. Details of construction and list of materials will be furnished upon request.

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By U. R. Gore, W. H. Freeman, S. A. Parham (Tifton).

Differential winterkilling of oats occurred this past season at Tifton. Several new hybrid lines were nearly as hardy as Atlantic and further selection is being continued in these. The Red Rustproof lines of oats - Rustproof 14 and Hastings 100 Bushel, were less hardy than Terruf and Nortex strains. Breeding work to develop oats adapted to the Coastal Plain for grazing and grain was started in 1950. The oat nursery was expanded in the fall of 1951. Replicated block plantings (1/40 acre) of the main commercial varieties of oats and wheat are grown. These are valuable demonstrations for farmers and students. Grain yields are taken on these blocks.

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IDAHO

By Harland Stevens (Aberdeen).

The yields of oats grown on irrigated land of southern Idaho in 1951 were near normal. This was true of most of the Pacific Northwest and Inter-Mountain Regions. Below normal precipitation during the growing season resulted in below average oat yields in some of the dryland areas. No diseases of consequence were observed or reported.

The varieties, Cody and Overland, were released to growers of the Pacific Northwest one and five years ago, respectively. These 2 varieties have good grain quality, strong short straw, and yield nearly equal to the tall midseason varieties commonly grown here. Both Cody and Overland are selections from the cross (Victoria x Richland) x Bannock, have a high degree of smut resistance and some rust resistance, but are susceptible to Helminthosporium victoriae.

The first selections, tested in the West, from crosses involving either Victoria or Bond as one parent suggested area adaptation. Until recently only one selection from Bond crosses produced a satisfactory yield west of the Continental Divide. Shelby has produced average yields equal to Victory and other oats of this area. Oat selections from crosses involving Andrew and/or Clinton have produced very high yields in the past 2 years.

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ILLINOIS

By J. W. Pendleton, W. M. Bever, O. T. Bonnett (Urbana).

The 1951 estimated average yield from 3.4 million acres of spring oats was 42 bushels per acre. This was 1 bushel above the 10-year period 1940-1949. According to surveys by the Illinois Cooperative Crop Reporting Service, 78 percent of the oat acreage was seeded with either Clinton or Clinton selections.

The loss from crown rust was almost entirely confined to the northern half of the state. The over-all state yield loss as estimated by Mr. G. H. Boewe, State Natural History Survey, was 4 percent. This estimated loss was 6 percent less than the 1950 estimate. Only a trace of stem rust was observed.

Blast was more prevalent throughout the state than in several seasons. Septoria, Helminthosporium leaf spot and anthracnose were observed but were of little consequence.

The small acreage of winter oats in extreme southern Illinois was almost completely winterkilled in 1951. Thus far the present winter crop has survived and is in excellent condition.

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INDIANA

Purdue University, Agricultural Experiment Station^{1/}

Highlights of the Breeding Program

Two of the main points of emphasis in the Purdue oats breeding program continue to be the incorporation of stiffer straw and resistance to crown rust into commercial oat varieties. This past season both the most severe crown rust epidemic and the most

^{1/} Department of Agronomy, Department of Botany and Plant Pathology and U.S. Department of Agriculture cooperating in oat improvement at Purdue. Personnel contributing include K. E. Beeson, P. L. Crane, G. H. Cutler, R. R. Mulvey, J. E. Newman, F. L. Patterson and G. P. Walker of the Department of Agronomy and R. M. Caldwell, L. E. Compton and J. F. Schafer of the Department of Botany and Plant Pathology.

severe lodging test within the memory of any of the present staff were obtained in the breeding nursery. Straw of Clinton and Clinton derivatives continued to look superior to anything else in the nursery. This year selection was begun also in crosses between stiff strawed Clinton derivatives and lines selected for their particularly large straw.

Lines of Landhafer x (Clinton 59)⁴ were superior for both straw and crown rust resistance and appeared so uniform that a number of them were bulked and sent to Arizona for a winter increase. Lines of Clinton x Boone, Cartier carrying moderate crown rust resistance from Victoria ranged from 5% R to 65% I to S in crown rust reaction but continued to yield near the top of the nursery in spite of this severe crown rust epidemic. These lines which previously appeared equal to Clinton for straw were found to be slightly poorer under the extreme lodging test. Two of these lines were entered in the Uniform Midseason Nursery for 1951. Lines of Clinton² x Arkansas 674 which are superior for both stiff straw and crown rust resistance were yield tested for the first year, and several lines were determined to be superior in yield as well. Two of these lines are entered in the Uniform Rust Nursery for 1952. These lines are about equal to Landhafer derivatives in field resistance to crown rust but show an intermediate seedling reaction to certain biotypes of race 45.

All of the material in the breeding nursery was inoculated with Indiana collections of smut. Good differential infections were obtained and only smut resistant lines were continued.

Bulk hybrids in the F₄ generation of the following material are available in small quantity⁴ to anyone who wishes seed of them:

- 4912 = Clinton², Ark 674 x D69, Bond, Hajira, Joannette, Victoria
- 4916 = Landhafer x (Clinton 59)⁴
- 4917 = Clinton³ x Ark 674
- 4919 = Clinton², Ark 674 x Clinton, Cartier
- 4920 = Benton⁴ x Ark 674
- 4921 = Landhafer, (Clinton 59)² x Clinton, Cartier
- 4922 = Landhafer, (Clinton 59)² x D69, Bond, Cartier
- 4923 = Clinton², Ark 674 x D69, Bond Cartier

Disease and Insect Notes

"Leaf reddening" of oats was prevalent again in 1951 but the "gray spot" condition found following it in recent years was not observed this year. Crown rust came in only very sparsely and too late to cause appreciable damage. Damage from stem rust was also negligible.

There was a rapid buildup of aphids early in the season but very few were observed later.

Testing

The 1951 spring oat season was wet and relatively mild for Indiana. The state average yield was slightly above the previous 10-year average. C.I. 5940 and C.I. 5941, selections out of Clinton x Boone, Cartier developed at this station, gave the best performance where they were tested at three widely separated locations. Among the named varieties, Mo. O-205 produced the highest average yield in the six tests conducted over the state largely due to its superior performance in the southern half. Branch, Ajax and Benton were among the highest yielding in the northern part. Those making the poorest showing over the state as a whole were Columbia, Craig and C.I. 5298.

Oat variety demonstrations were conducted by extension agronomists, county agents and their farmer cooperators at 49 locations. Mo. O-205 was entered mostly in counties in the southern half of the state and produced the highest average yield in this area. Branch was entered only in northern counties where it produced the highest average yield; Ajax ranked second in this area. Varieties making a poor showing included Exeter, Nemaha and Larain.

Winter oats were severely winter damaged in Indiana.

Certification

The Seed Certification Service inspected 12,878 acres of oats, 92.8 percent of which was of Clinton 59. Other varieties were Benton and, for inter-state certification, Mohawk, Nemaha, and Shelby. About 15 percent of the seed is below minimum germination to qualify for certification. Test weights of samples averaged better than those of seed produced in 1950.

Looking Ahead

Mo. O-205 was increased in 1951 and has been recommended to the Experiment Station Release Committee for release to certified growers in southern Indiana for 1952.

A new winter oat, Clinton x Forkeddeer, 4011-4-92, entered in the Uniform Special Winter Oat Experiment for 1951-52, is also being increased for possible release.

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IOWA

By R. E. Atkins (Ames).

The 1951 oat crop was the smallest produced in Iowa since the Helminthosporium damaged crop of 1947. Planting dates in most sections of the state were at least two weeks later than normal, with delays being greatest in the northern and northwestern cash grain areas. Yield losses from disease were not severe, but climatic conditions did not favor optimum growth throughout most of the growing season. An estimated 182,886,000 bushels of grain was produced on 5,542,000 acres for an average yield of only 33.0 bushels. The average yield and production estimates are somewhat lower than for the past ten year period and considerably less than those of the bumper crops of the past three years.

Serious damage from crown rust infection was localized and generally occurred in fields that bordered or were in the vicinity of buckthorn hedges. Stem rust infection was negligible throughout the state.

Yield trials with 18 named oat varieties were planted at 11 locations in Iowa in 1951. As in 1950, midseason to late maturing varieties outyielded the earlier types in nearly all tests. Averages for the four year period 1948-51 rank Ajax first in yield, followed by Mo. O-205 and Shelby.

The performance of the newly released varieties Mo. O-205 and Branch in 1951 and for the period 1948-51 has been very good. The yield of Mo. O-205 (C.I. 4988) at the four southern testing stations has been particularly noteworthy. Averages for the 1950-51 seasons place Mo. O-205 first in yield at all four stations. It appears that this variety may be particularly well adapted to southern Iowa and possibly well into the central sections of the state.

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By H. C. Murphy, Ames (Iowa-U.S.D.A.).

Reaction of Oat Varieties to Crown Rust in the 1951 Uniform Rust Nurseries

A cooperative uniform oat rust nursery consisting of 12 perpetuable varieties and 18 new varieties and selections was grown at 40 locations in 1951. Sufficient infection developed to allow crown rust readings in 26 of the nurseries. These 26 nurseries were distributed among the four regions of the United States as follows: none in western, one in northeastern, nine in southern, and ten in north central. Heavy crown rust infection was recorded at Baton

Rouge and Crowley, La.; Lafayette, Indiana; and Manhattan, Kansas, while moderately heavy infection was recorded at St. Paul, Minn.; Ithaca, N. Y.; Fayetteville, Ark.; and Quincy, Fla.

The ten varieties and selections showing the highest resistance to crown rust at all locations were Landhafer, Santa Fe, Trispermia, Santa Fe x Clinton (C. I. 5400), Santa Fe x Clinton³ (C. I. 5869), Victoria, Cedar, Ukraine, [(Vict. x Haj.-Ban.) x (Fulg. x Vict.)] (C. I. 5371), and D69-Bond x Fultex (C. I. 5370), with average infection coefficients of 1.0, 2.4, 3.1, 3.6, 3.7, 3.8, 6.2, 7.3, 7.9 and 9.7 percent, respectively. Moderately resistant varieties were Mustang, Red Rustproof, Branch, Craig, Mo. 0-205, Atlantic, D69-Bond x Fultex (C. I. 5388) and Ajax with average infection coefficients of 10.0, 12.2, 16.1, 16.8, 17.3, 17.6, 18.0 and 18.9 percent, respectively. Rainbow, Cherokee, Bond, Columbia x Marion (C. I. 4986), [(Bond-Iogold) x Vict. x Haj.-Ban.] (C. I. 5907), Canuck, Minrus, Shelby and Bond-Rainbow x Hajira-Joanette (C. I. 5906) were moderately susceptible with average infection coefficients of 23.8, 25.7, 26.7, 27.2, 27.8, 29.3, 29.8, 33.4 and 36.0 percent, respectively. Clinton and Markton were outstanding for high susceptibility with average infection coefficients of 41.7 and 45.2 percent, respectively.

Prevalence and Distribution of Physiologic Races of Crown Rust in 1951

More than 300 collections of crown rust, well distributed throughout the oat growing regions of the United States, were obtained in 1950. A total of 190 isolates from these collections have been identified to date by Mr. Marr D. Simons. Eight physiologic races (Nos. 1, 6, 45, 55, 57, 88, 95 and 101) were differentiated using the old set of 13 standard differential varieties, while 21 races could be differentiated using a new revised set of 10 differential varieties. Race 45 was the most prevalent, making up 75.3 percent of the 190 isolates. Races 101 and 57 were the next most prevalent making up 13.7 and 6.8 percent, respectively, of all isolates. The races to which Bond and most of its derivatives were susceptible made up 99.0 percent of the isolates identified to date.

Revision of Oat Varieties Used for Identifying Physiologic Races of Crown Rust

Numberous investigators have expressed the opinion that the 13 standard differential oat varieties used in the United States and most other countries since 1930 for identifying 101 physiologic races of crown rust were not entirely satisfactory as differentials because (1) they did not give a clear cut reaction to certain races and (2) they did not represent the principle sources of resistance to crown

rust now being utilized in most oat breeding programs in the United States and Canada. The number of oat varieties which could be used to differentiate races of crown rust is very large - more than 100. Therefore, the maximum number of races which could be identified by using the maximum number of differential varieties is likewise very large - probably over 1,000. Since any selected set of differential varieties obviously identifies only groups of similar races or strains there would appear to be no particular advantage in using a set of differentials which enables one to identify the maximum number of races.

Messrs. B. Peturson, H. A. Rodenhiser, H. R. Rosen, T. R. Stanton, Matt Moore, Marr D. Simons, and the writer have agreed to adopt a new revised set of ten standard differential oat varieties for identifying physiologic races of crown rust starting with the 1951 collections. Four of these varieties were used in the old set of 13 standard differentials, and six represent new varieties not previously used as standard differentials in North America. A list of the old standard differential varieties and the new revised standard differential varieties is given below:

Old Standard Differentials			Revised Standard Differentials		
Variety		C.I.	Variety		C.I.
No.	Name	No.	No.	Name	No.
1	Ruakura	2025	101	Anthony	2143
2	Green Russian	2890	102	Victoria	2401
3	Hawkeye	2464	103	Appler	1815
4	Anthony	2143	104	Bond	2733
5	Sunrise	982	105	Landhafer	3522
6	Victoria	2401	106	Santa Fe	4519
7	Green Mountain	1892	107	Ukraine	3259
8	White Tartar	551	108	Trispermia	4009
9	Appler	1815	109	Bondvic	5401
10	Sterisel	2981	110	Saia	4639
11	Belar	2760			
12	Bond	2733			
13	Glabrota	2630			

It is proposed that all races identified with the new revised set of differential varieties will be numbered starting at 201. Since some investigators, particularly in foreign countries, doubtless will continue to use the old set of differential varieties for identifying races for an indefinite period, it seemed advisable to leave numbers 102 to 200, inclusive, for any additional races which may be identified with the old set of differentials. It is hoped that not more than 99 additional races will be identified with the old differentials.

Races identified with the new differentials should be of more interest and value to plant breeders and plant pathologists than those identified with the old ones, since almost all current breeding programs are utilizing the varieties Victoria, Bond, Landhafer, Santa Fe, Ukraine, Trispermia, Bondvic and Saia as their sources of resistance to crown rust. It is expected that a number of Santa Fe and Landhafer derivatives will be distributed to farmers for growing in the United States within the next few years.

Although Landhafer and Santa Fe are not known to be susceptible to any races of crown rust present in the United States or Canada, it seemed advisable to include them as possible differentials, since they are known to be susceptible to certain races already present in South America. The other varieties in the revised set of differentials already have exhibited a differential reaction to certain races and biotypes present in North America.

Reaction of Oat Varieties and Selections to Septoria Black Stem and Powdery Mildew

Septoria black stem (Leptosphaeria avenaria Weber) was first observed in epiphytotic proportions in Iowa in 1946. The disease has been present each year since then, being most severe during relatively cool wet seasons. Maximum estimated losses in yield for the state have not exceeded one percent. Septoria black stem has two distinct phases in the field. It is first evident in causing dark, necrotic leaf spotting of the lower leaves of plants early in the season. The black stem phase appears sometime after heading and becomes more severe as the plants near maturity. This secondary phase is characterized by the blackening of the upper plant internodes. As a result of these culm lesions certain varieties and selections have shown extreme lodging at the points of infection.

Mr. D. D. Poole found that Leptosphaeria avenaria produced a powerful toxin that was specific on *Avena* species and appeared to be responsible for the dark discoloration of infected culms and of the substrate on which the fungus was grown. Resistance to the disease was only relative with no clear-cut immunity being observed. Leaf spot and black stem readings showed a positive correlation of 0.632. Clinton, Branch, Mo. 0-200, Shelby, and Mo. 0-205 were the most resistant to the leaf spotting phase of the disease among 18 named varieties grown at ten locations in 1951, while Marion, Andrew, Cherokee, Mindo and Benton were the most susceptible. In the same nursery at eight locations Branch, Shelby, Ajax, Beaver and Clinton were the most resistant to the black stem phase while Andrew, Marion, Benton, Bonham and Colo were most susceptible. Experimental selections exhibiting high relative resistance to the black stem phase were Anthony-Bond x Boone (C. I. 5401), Santa Fe x Clinton³ (C. I. 5869),

Bonda x Santa Fe (C. I. 5721), Clinton x Boone-Cartier (C. I. 5941) and Andrew x Landhafer (C. I. 5707). (The masters degree thesis of Mr. D. D. Poole is on file at the Iowa State College Library and gives more detailed information on the reaction of oat varieties to black stem.)

Powdery mildew of oats (Erysiphe graminis (D. C.) var. avenae) has not been one of the major diseases of oats in the United States. Although it is frequently present in the more humid areas the writer had not observed the disease in Iowa during the past 25 years, either in the field or greenhouse, until it appeared in the greenhouse at Ames in the fall of 1950. Mr. D. D. Poole observed that Mo. O-205 (C. I. 4988) was the only variety resistant to powdery mildew among 18 named varieties he was testing for reaction to Septoria.

Mr. Ralph E. Finkner determined the seedling reaction of 4,289 oat varieties and selections to powdery mildew. Using host reaction classes 0 to 4, he found none of the varieties and selections gave an immune or 0 type reaction, two gave a 1 type, and four gave a 2 type. Fifty-nine of the entries were classified as at least moderately resistant while the remaining 4,230 entries were classified as moderately or highly susceptible. The varieties Landhafer and Missouri Sel. No. 04015 were the most resistant varieties tested, giving a 1 type reaction. The four varieties giving a 2 type reaction were Red Rustproof x Victoria-Richland (C. I. 4386), White Mildew Resistant (C. I. 4898), Missouri O-205 (C. I. 4988) and Neosho x Landhafer (C. I. 5663). It is interesting to note that Missouri O-205 (C. I. 5323) was moderately susceptible. (The masters degree thesis of Mr. R. E. Finkner is on file at the Iowa State College Library and gives more detailed information on the reaction of oat varieties to powdery mildew.)

New Selections Being Increased for Probable Naming and Distribution

Seed of Santa Fe x Clinton³ (C. I. 5869), Sac x Hajira-Joanette (C. I. 5927) and Clinton x Marion (C. I. 5647) was increased in Arizona and Idaho during the past year by the Iowa Committee for Agricultural Development. A somewhat smaller increase of Clinton x Marion (C. I. 5440) was made at Ames, Iowa. Seed of these four selections was offered to experiment stations in the North Central Region for further increase in 1952. All available seed of C. I. 5869 (except for experimental testing in rod rows) has been allocated. Seed of C. I. Nos. 5927, 5647 and 5440 is available for testing and increase by experiment stations. The disease reaction, performance and characteristics of these selections will be supplied upon request.

Approximately 1600 bushels of Cherokee (C. I. 5444), more uniform for height and maturity than the original Cherokee (C. I. 3846), has been distributed to Iowa growers for 1952 seeding. Breeders seed of Clinton, Benton, Cherokee, Nemaha, Shelby and Marion will be increased at Ames in 1952. Limited amounts of foundation seed of these varieties should be available for 1953.

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KANSAS

By W. M. Ross & A. F. Swanson (Fort Hays)

The Oat Situation in Western Kansas in 1951

Oats were planted at the Hays Station on March 17 but did not emerge until April 7 because of an early period of low temperature. Although the early part of the growing season was more or less normal with respect to moisture conditions, high rainfall in May and June somewhat reduced the expected 1951 yields. However, above average yields were obtained ranging from 54 to 81 bushels per acre.

The standard, red oat varieties, Fulton and Kanota, again demonstrated their high yielding ability in this area with both averaging 75.4 bushels. They were surpassed only by Missouri selection, C. I. 4988, one of the lines composing Mo. O-205, which yielded 81.2 bushels. The other Missouri line, C. I. 5323, yielded almost equally well and appeared identical to C. I. 4988.

Diseases were not serious in 1951 though "red leaf" appeared in the last half of May. Damage was not apparent later in the season. Helminthosporium victoriae was severe in Osage and is becoming more important in this part of the state as a limiting factor in oat production.

Though the breeding program at this station is not extensive, a promising group of F5 and F6 material is at hand, some of which may possibly have the earliness, standability, and disease resistance desired. Earliness is of vital importance in this section of the country so that hot weather may be escaped. With this the seriousness of rust infections are often simultaneously reduced. Victoria blight must now be more seriously considered while "red leaf" and other so called minor diseases may become more prevalent,

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KENTUCKY

By D. A. Reid (Lexington).

As a part of screening process of the world oats collection for new sources of germ plasm, the first 1200 entries were fall sown at Lexington for winter survival data. An additional 300 of the more recent introductions were also planted. Of the total, only 79 had any surviving plants, and only 23 survived 50% or more. These were replanted in the fall of 1951 for further tests, together with an additional 300 strains not tested at Lexington before.

The winter of 1950-51 was one of the most severe in recent years as far as winterkilling in oats is concerned. Excellent differential killing was obtained in the breeding nursery. However, it was evident that some of the varieties which survived 100% were damaged with resulting low yields.

As a result of tests over the past 6 years, Atlantic oats has been added to the list of recommended oat varieties for fall seeding in Kentucky. Atlantic has been equal to or higher than Fulwin and Forkeddeer in Kentucky tests, and is of course much superior in straw strength and crown rust resistance.

For spring seeding, Andrew appears to be one of the best varieties for Kentucky, and was added to the recommended list in 1951, together with Mindo and Mo. O-200.

A small acreage of Andrew was certified in Kentucky this year, and this is the first time in several years that any spring variety except Columbia has been certified.

Helminthosporium victoriae was moderately severe at Lexington on Osage, Neosho and Tama. This is the first time since 1947 that this disease has been of importance in Kentucky. It has not yet been identified on fall sown oats in this state.

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LOUISIANA

By John Gray (Baton Rouge)

Oats have made excellent growth this winter and look most promising at present. The plots at Baton Rouge have shown such an abundant growth with a mild January that lodging has resulted in some instances. Of course farmers have taken advantage of this condition by profitable grazing. Oats making succulent growth in abundance have been seriously injured here by late freezes in the

past. Although there were exceptionally low temperatures early in 1951, little winter injury was recorded at this station when seeding was done in late November and excessive growth had not been made when the freezing weather was encountered.

Very satisfactory yields were obtained from varieties and strains adapted to this area in 1951. The Southland was outstanding in its resistance to lodging under severe weather conditions. Re-selections made here of Alber proved promising in this respect also. While the Camellia - which was developed at this station - produced quite satisfactory yields, it lodged badly with a height of 65 inches. Selections from hybrid material including Landhafer furnished by Mr. F. A. Coffman appear quite promising for this area.

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By J. G. Atkins (Baton Rouge).

Oat Diseases in Louisiana

Nursery plantings at three branch stations are examined each year in addition to the Crops and Soils Department plots at Baton Rouge. The "consistent" epiphytotics of crown rust and *Helminthosporium* (*H. victoriae*) referred to in the first Newsletter as providing excellent opportunities for determining the resistance of new or untested strains in field plantings failed to develop in 1951. Although crown rust eventually developed to the extent that the more susceptible varieties were given high rust ratings before maturity at Baton Rouge, the disease was late in becoming epiphytotic and conditions were certainly not ideal for evaluating the crown rust resistance of new selections or varieties. The same situation prevailed with *Helminthosporium* or Victoria blight. At two stations in north Louisiana crown rust readings were not made due to light and erratic infection. Stem rust was essentially absent in 1951. Anthracnose and *H. avenae* were quite prevalent.

Studies have been continued on various pathological problems and "disease" conditions. The local leaf spots caused by *H. victoriae* on susceptible varieties under field conditions in Louisiana were illustrated in *Phytopathology* (Phytopath. 41: 300-301. 1951).

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MAINE

By L. H. Taylor (Orono).

The cold, wet 1951 growing season was not as favorable for oats as that of 1950. Although yield per acre were somewhat below 1950, oat acreage was up to 130,000 acres and oat production in Maine

was the highest it has been for many years. The most widely grown oat varieties continue to be Ajax and various selections of Clinton.

None of the oat diseases were of importance in Maine in 1951. No crown rust or stem rust was found in farmer's fields. The Uniform Oat Rust Nursery was grown for the first time in several years but the only readings obtained were of stem rust on some of the late varieties and winter types. Traces of smut and Helminthosporium avenae were found in the test plots but these diseases were not serious on any of the oat strains.

The oat yield testing program was expanded considerably in 1951. The New England Uniform Oat Nursery was grown at two locations, the Uniform Midseason Oat Nursery at one location and three other yield trials were grown that included varieties and selections not present in the Uniform Nurseries. In certain of the 1951 tests, Exeter, Craig and Branch were outstanding in yield performance. Of the varieties now recommended for growing in Maine, Ajax had the highest yield.

An oat breeding program was initiated in Maine in 1951. This was possible through the generosity of Dr. H. C. Murphy and a number of other oat workers in the northern states and Canada who shared some of their breeding material with us. The writer thanks these men and the U.S.D.A. workers who have been most cooperative in assisting the Maine oat program.

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MICHIGAN

By K. J. Frey (East Lansing).

The growing season in Michigan was late in 1951, but rain was plentiful and the season was cool so oats were a good crop. Planting of oats did not start until May 1 and the harvest was also delayed about two weeks.

1. Yield tests - In the rod row tests located at five places in the lower peninsula the four highest yielding strains of oats were C.I. 5441, Craig, C.I. 5650, and Huron with average yields of 79.8, 79.1, 78.3, and 76.7 bushels per acre, respectively. For comparison Clinton and Eaton yielded 71.6 and 67.9 bushels per acre, respectively.

In the field plot tests six varieties were included in 1951. Clinton proved to be superior to other varieties.

2. Disease notes - According to data collected in 1951 from 40 oat varieties the plants affected by "Red Leaf" disease had four times as many blasting of kernels as did normal plants. The percent

of blasting was 6.0 and 22.5 for the normal and "red leaf" plants, respectively. The weight per-hundred-kernels was approximately equal for both types of plants. It would appear that most of the 12.5 percent reduction in yield caused by red leaf was due to the excessive kernel blasting.

The first 1200 entries in the oat world collection were grown in 1951 and notes were taken with respect to their Septoria or "black stem" reaction. About 25 strains were saved for further testing.

3. Chemical Composition - C.I. 5298, C.I. 3656, Bonda, and Kent varieties of oats have the highest percentages of protein and of various amino acids among the varieties tested.

It has been found that the alcohol soluble protein in oats constitutes about 18 percent of the total protein regardless of the level of total protein in the oats. It has been found by other workers that the avenin (alcohol soluble portion) fraction is responsible for oat protein being poor in quality.

In 14 oat varieties the protein percentage was 25 percent higher in 1949 than in 1947. However, the four amino acids, lysine, leucine, methionine, and tryptophan increased 47, 47, 43 and 12 percent, respectively. This shows that the proportions of various amino acids in the protein was changed when the total protein content increased.

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MINNESOTA

By H. K. Hayes & Guy L. Jones (St. Paul).

Current Information Regarding Oat Improvement Studies at Minnesota

The oat improvement work at Minnesota is under the joint direction of Dr. H. K. Hayes in Agronomy & Plant Genetics and Mr. M. B. Moore in Plant Pathology. Dr. Francis Koo, research fellow in Agronomy & Plant Genetics, devotes half time to the project. Two assistants, Guy L. Jones in Agronomy & Plant Genetics, and S. Goto in Plant Pathology, also devote approximately half time to this project. The work of Mr. Jones is financed through funds made available by the Quaker Oats Company.

Three separate rust epidemic nurseries were grown in 1951 for special disease studies. One of these nurseries was inoculated with stem rust races 7 and 8, another with race 7 and the other with

race 8. An epidemic of crown rust was created in each of the nurseries using races 45, 57 and other prevalent races. All material in these nurseries was inoculated with prevalent collections of smut. Varieties and selections now under study in yield trials and hybrid material were grown in these nurseries. Excellent notes were obtained on plant diseases, although a very destructive wind and rain storm on July 20 caused severe lodging which made selection for agronomic characters most difficult.

The field work is supplemented by studies in the greenhouse on individual races of stem and crown rust. At the present time individual plants carrying the Canadian plus Richland or White Russian type of stem rust resistance are being tested at high temperatures (85° F.), with supplemental light, to race 7 or 8 as determined by the parentage. Plants carrying both factors for resistance do not break down at high temperature, whereas plants carrying only the Canadian type of resistance show a susceptible type of reaction at high temperatures. Some difficulties in maintaining the proper temperatures and light conditions were experienced at first, but these have been overcome, and results are now correlating very closely with previous studies.

Several selections from crosses between Landhafer and selections carrying both the Canadian and White Russian type of stem rust resistance showed some promise in yield trials in 1951. They were highly resistant to stem and crown rust. Although their yield was somewhat less than that of Andrew and Clinton, they are well worth continuing because of their resistance to stem and crown rust and to smut.

A considerable number of selections from Santa Fe or Landhafer, with hybrids carrying Canadian resistance to stem rust plus White Russian or Rainbow resistance with the Bond type of crown rust resistance, will be in preliminary yield trials in 1952.

The most promising material at the present time consists of F₃ selections from crosses between the varieties Andrew and Clinton with selections of Landhafer x the Canadian plus Richland or White Russian type of stem rust resistance. Selections resistant in the field in 1951 to stem rust races 7 and 8, crown rust and smut are being grown in F₄ and F₅ generations in the greenhouse in 1951-52. In this manner the breeding program is being speeded up so that some of these lines may enter the yield test at an earlier date.

A backcross program is also under way to combine the agronomic qualities and smut resistance of the varieties Andrew and Bonda with selections carrying Landhafer or Santa Fe type of crown rust resistance and Canadian plus Richland or White Russian type of stem rust resistance. The first two backcrosses are being made in the

greenhouse during the winter of 1951-52.

The summer was cool and wet; therefore very little rust developed except where artificial epidemics were created. Few disease notes were taken at the branch stations during 1951.

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MISSISSIPPI

By D. H. Bowman (Stoneville).

The 1951-52 small grain nursery looks very good at the end of January. Thus far, cold temperatures have not been as severe as in the 1950-51 season. Temperatures as low as 20° F. occurred in November and December, but the temperature changes were not usually abrupt. However, November and December were generally cold, and late October seeded oats made little growth until the first of January. The ends of the leaves of most common oat varieties were killed. More hardy varieties like Mustang were not damaged, whereas less hardy varieties such as Southland had from one-half to three-fourths of the top growth killed. Several of the new selections in the Uniform Nursery do not appear to possess any great degree of hardiness. Of possible interest is the selection Fla. 167 x Landhafer, CI 6581, which was moderately damaged by cold. A selection made at Stoneville in 1949 from the same cross had only the tips of the leaves damaged by cold and would seem to have average or better cold resistance. Trispermia x (Clinton 2 - Santa Fe): sel. 2819-1, CI 6580, was severely damaged by the cold, while the sister selection, No. 2819-3, CI 6582, was only slightly damaged.

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MISSOURI

By J. M. Poehlman (Columbia).

The Mo. O-205 Variety

The release of Mo. O-205, a new variety of oats from the cross Columbia x Victoria-Richland was reported in the 1950 Oats News Letter.

Twenty-one Missouri Certified Seed growers participated in the increase of this variety in 1951 and approximately 12,000 bushels of seed was produced. This amount is smaller than was hoped for, but 1951 was an extremely poor oat season in Missouri and the state yield average was very low. All of this seed was sold by December 1,

and practically all of it will be increased under certification in 1952 by Missouri seed growers.

In addition to the above increase, 50 bushels were distributed to each the Illinois and Indiana Agricultural Experiment Stations and 12 bushels to the Wisconsin Agricultural Experiment Station for increase in 1951. The Nebraska Agricultural Experiment Station obtained 100 bushels from the 1951 crop for increase in 1952.

Two strains C.I. 4988 and C.I. 5323 were distributed to Missouri seed growers, without mixing under the name Mo. O-205. These are sister selections, made in the F8 generation and are indistinguishable in the field. The average yield of these two strains in 19 tests in Missouri over a four year period has been 55.6 and 55.1 bushels respectively, as compared to 52.3 bushels for Andrew, 51.2 bushels for Mo. O-200, and 45.3 bushels for Clinton. In the uniform nurseries C.I. 4988 has shown a greater superiority over C.I. 5323, indicating that it may be better adapted over a wide area. A purification of C.I. 4988 is being made, which will probably be designated as the "foundation seed" for the O-205 variety as soon as it is increased sufficiently. All of the seed obtained by the Illinois, Indiana, Wisconsin and Nebraska stations has been the C.I. 4988 strain.

The high yield and wide adaptation of the O-205 variety in the Southern Spring oat area has been established by the excellent yield record of C.I. 4988 in the Uniform Oat Nurseries. Grain of O-205 has excelled in test-weight and the variety is particularly resistant to lodging caused by wind and rain storms as a result of its well developed root system. It is resistant to smut, Victoria blight, crown rust (including race 45) and races 2 and 7 of stem rust.

Columbia x Marion Selection

A selection from the cross Columbia x Marion, C.I. 4986, has also been increased, since it has different sources of smut, crown rust and stem rust resistance than Mo. O-205. There are no plans for its distribution at present, but a small increase will be maintained, which could be rapidly expanded if new races of rust or other disease should arise that damaged the O-205 variety. While yields of C.I. 4986 are almost equal to those of O-205 in Missouri, it apparently does not have as wide an adaptation as yields in the uniform nursery are generally lower than for the Columbia x Victoria-Richland strains.

Studies on Inheritance of Earliness

Studies on the inheritance of earliness have been made by Mr. Wm. P. Sappenfield as a Doctorate thesis problem. Using two early varieties, Mo. 0-200 and Andrew; two intermediate varieties, Clinton and Shelby; and two late varieties, Ajax and Victory, all possible crosses were made. Results indicate earliness to be partially dominate with the varieties differing by at least two to four genes. True breeding F3 lines as early as the early parent could be obtained from every cross and in most crosses lines were recovered that were earlier than the earliest parent.

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NEBRASKA

By L. P. Reitz (Lincoln).

Varieties Recommended for Irrigated Land

Oat variety trials under irrigation were begun five years ago at the North Platte and Scottsbluff substations and in Outstate Tests in nearby counties in western Nebraska. Approximately 25 varieties have been under observation each year. The accumulated data give Overland and Ajax the most support for the far west and Andrew the advantage for central and southwestern areas. Blight susceptible varieties have been unsatisfactory at North Platte but are among the most productive toward the Wyoming line. The Bond hybrids have given only fair yields in the far west but look progressively better eastward in the state.

Nebraska has about 900,000 acres under irrigation. Although only a small portion of this is sown to oats, interest in this crop by irrigation farmers has increased sharply in recent years.

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By V. A. Johnson (Lincoln).

The Use of Mosquito bars for protection of Oats in the Field

The small grains nurseries at Lincoln, Nebraska, have been subject to severe damage between heading and maturity by birds from the surrounding wooded residential areas. This problem has been especially serious in the rust nursery where many rust-resistant plants in hybrid populations have been lost through the feeding of large numbers of sparrows and other birds.

Surplus box-style army mosquito bars were used successfully in 1951 to protect early generation oat hybrids in the rust nursery. The mosquito bars which are 6-1/2 feet long, 2-3/4 feet wide, and 4 feet high were suspended over the oats at heading time and allowed to remain until harvest. They were held firmly in position by fastening their corners to steel fence posts driven into the ground in the proper positions, as shown in the accompanying snapshot. Tagged crown rust resistant oat plants were thereby protected from destruction by birds until they could be harvested. A number of promising rust-resistant lines in 3-foot rows were similarly protected in the rust nursery. Although the mosquito netting reduced the light by approximately 35 per cent flowering and ripening of the oats within the enclosures progressed normally.

The estimated material and labor cost per unit of cover was less than \$1.00. This does not include the steel posts which were borrowed from another department. The mosquito bars are sturdily made and appear to be strong enough to withstand repeated use as protective devices in the experimental nurseries. The success with which they were employed last year at Lincoln suggests their general usefulness for protecting limited areas of oats and other small grains against the various environmental hazards frequently encountered between heading and maturity.

(Ed. note: We are unable to reproduce the photograph which accompanied this article but interested readers may write directly to the author for a print.)

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NEW HAMPSHIRE

By Leroy J. Higgins (Durham).

Since the release of the first Oat Newsletter, the 1951 results of the uniform variety trials have been summarized. These trials were carried out in three widely separated areas in the State: At Durham in the southeastern coastal area, at Claremont in the west central part of the Connecticut River, and at Lancaster in Northern New Hampshire.

The comparative yield data follows:

	Forage in Tons/Acre			Grain in Bu./Acre		
	1949	1950	1951	1949	1950	1951
Durham	3.01	3.13	2.94	65.4	76.1	74.8
Claremont	2.53	3.76	1.84	53.0	65.5	47.0
Lancaster	3.15	4.13	2.17	59.7	84.1	58.2

The 1951 low yields at Claremont and Lancaster were primarily due to planting very late after May 15. Many of the newer varieties in 1951 again yielded much higher than Clinton, Ajax and Mohawk, which are the leading state varieties. New Hampshire farmers are not only interested in good grain yields but, also, in high forage returns since oats are grown extensively for pasturage and annual hay.

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NEW YORK

By N. F. Jensen, A. A. Johnson, G. C. Kent, L. J. Tyler & R. B. Musgrave (Ithaca).

Record Oat Crop

The figures on 1951 oat production in New York (from December 1951 New York State Crop Report) indicate that 36,240,000 bushels were harvested from 755,000 acres. The average of 48 bushels to the acre is a record for New York being 5 bushels above the previous high of 43 set in 1950.

Mohawk, Clinton and Advance Principal Varieties

Principal varieties grown in New York are Mohawk, Clinton, Advance, (these 3 account for an estimated 85% of the total acreage) Ajax, Goldwin, Lenroc and Victory.

Craig, New Oat Variety Released

Craig, C.I. 5332, is a new midseason oat variety developed at the Cornell Agricultural Experiment Station in cooperation with the U.S.D.A. from a cross between Ithacan and Victoria. It is named after the late William T. Craig, Experimentalist in the Department of Plant Breeding at Cornell University. Twenty acres of Foundation Seed were grown in 1951 by the New York Foundation Seed Stocks Co-operative, Inc.

Craig is a high-yielding, uniform, short, midseason-maturing oat resistant to smut and Helminthosporium blight and partially resistant to race 45 of crown rust. A summary of all the results obtained in nurseries during the three-year period 1949-1951 (Includes 84 different yield trials) with Craig and other leading varieties is shown in the following table:

	Average yield b.p.a.	Gain or loss of Craig is b.p.a.	Test weight %	Test weight lbs/bu.	Height (inches)	Lodging %
Craig	64.8	----	---	31.7	33.4	31.8
Ajax	72.1	-7.3	-11	31.8	39.2	40.5
Advance	58.8	+6.0	+10	34.0	40.5	40.6
Mohawk(or Clinton)	58.7	+6.1	+10	33.6	34.2	20.5

Craig is an extremely uniform and attractive oat in the field. Although only an inch below Mohawk in height, it appears shorter than this because of a very deep head layer. Its straw, however, is not as stiff as that of Mohawk and Clinton.

Craig has shown good field resistance to race 45 of crown rust to which Mohawk is susceptible. In special late-sown rust nurseries Craig has averaged 10% infection compared with 54% for Mohawk.

New Mohawk Seed Stock in Use

All Mohawk grown in 1952 for certification in New York must trace to a new stock of Breeder's Seed developed at the Cornell University Agricultural Experiment Station and released to the New York Foundation Seed Stocks Cooperative, Inc. for initial growing of Foundation Seed in 1950 and Registered Seed in 1951. This procedure is in line with the recommendations of the oat conference held in Milwaukee in 1949 and there will be no change in the name Mohawk. The new stocks are remarkably uniform and notable for the absence of the occasional tall, later-maturing plants which were typical of the first release of the variety.

Winter Oats

For several years there has been a steady northward movement of winter oat production in the Eastern United States, the present line being somewhere near southern Pennsylvania. If reasonable progress is made in the discovery and development of greater winter-hardiness, winter oats may be tried in New York as an experimental crop a decade or more from now in much the same way that winter barley was tried a decade ago. Results from small observational plantings at Ithaca the past 3 years with Cornell Selection 1375 (C.I. 5364) are as follows:

<u>Year</u>	<u>Kind of Test</u>	<u>Yield b.p.a.</u>	<u>Remarks</u>
1949	20 rod rows	58.8	
1950	49 rod rows	Not taken	Excellent survival; grain lost by shattering.
1950	1 drill plot 4'x88'	47.8	50% winter survival
1951	Six 36-ft. rows	54.8	

C.I. 5364, selected by H. H. Love and W. T. Craig, is one of 3 plants from the 1944-45 U.S.D.A. winter-hardiness nursery which survived the winter at Ithaca. Its identity is unknown because of the almost complete killing of the nursery accompanied by heaving of all stakes. It appears to have little to recommend it other than its excellent winter-hardiness.

A very small exploratory project on winter oat breeding is underway at Cornell. Two years ago, crosses were made between C.I. 5364 and several spring types. The second-generation progenies of these first crosses were sown in the field in the fall of 1951.

New York Regional Test Results

The average results from 11 oat entries grown at 11 locations in the State are as follows:

<u>Variety</u>	<u>Yield</u> <u>b.p.a.</u>	<u>Test</u> <u>weight</u> <u>lbs/bu.</u>	<u>Height</u> <u>(inches)</u>	<u>Date</u> <u>headed</u> <u>June</u>	<u>Lodging</u> <u>2 tests</u> <u>%</u>	<u>Crown Rust</u> <u>4 tests</u> <u>%</u>
Ajax	85.6	34.1	43.4	28.0	67	42
Goldwin	85.4	31.9	43.0	30.0	80	63
618al-4-6 ¹ / ₂	84.9	33.0	44.0	28.5	4	18
Branch	77.8	36.0	44.4	29.0	87	11
556al-9-6 ¹ / ₂	77.1	33.1	42.3	28.5	44	13
611al-12 ¹ / ₂	72.5	33.2	44.4	28.5	55	17
Craig	71.7	32.5	37.7	28.5	0	16
Clinton 59	64.7	34.9	36.6	23.5	2	74
Advance	64.0	36.3	42.1	23.0	72	57
La Salle	63.7	32.5	35.4	20.0	7	75
Mohawk	62.4	34.7	36.3	24.5	0	75

¹/₂ Pedigree series 618 is Goldwin x C.I. 4192 (Victoria x Rainbow); 556 is Goldwin x Boone; 611 is Goldwin x Clinton.

In interpreting these yields it should be borne in mind that while they represent inherent differences in yielding ability among the varieties, they do not necessarily measure the response of these varieties under actual farm production. Much of the high oat production in New York the past 2 years is due to the use of the stiff-strawed varieties Mohawk and Clinton which stand and produce high yields of grain at high-fertility levels. The capacity for higher yield found in the weaker-strawed varieties such as Ajax and Goldwin would not be realized under these conditions because of loss through lodging.

Breeding Stocks Available on Request

Two promising midseason oats are available to oat breeders for use as parents in their breeding programs:

N.Y. Garry Sel. 5: Exceptionally stiff straw, excellent quality, moderate resistance to Race 45, presumed to have the parent Garry stem rust resistance, yield potential unknown. (This seed stock shows low germination and should not be used for yield tests.)

N.Y. 611B-176-9: From Goldwin x Clinton, high yield, tall but with excellent straw, has shown very good crown rust resistance in New York.

Oat Rust in New York

1951 was not a particularly severe rust year in New York. Stem rust was present in only trace amounts except near barberries. Crown rust was also spotty but more general than stem rust. Crown rust caused an estimated 3% damage over the state, being as high as 60% near buckthorn hedges. The crown rust was most severe in central New York while stem rust was most severe in northern counties of the state.

Of particular interest are the races present in the state. In the case of stem rust, the majority of the collections (identified by Dr. E. C. Stakman, Univ. of Minn.) were race 7, some 8 and 12, a few of 2. One collection of race 13 was obtained from a field, probably Clinton, and one aecial collection proved to be race 5.

No racial determinations of crown rust have been made. However, it is interesting that Santa Fe and Landhafer showed 3 to 5 percent rust of a highly resistant type on 25 to 50 percent of the plants. In the test showing the more severe reaction, buckthorn were close by.

Speckled Blotch - Black Stem Complex of Oats

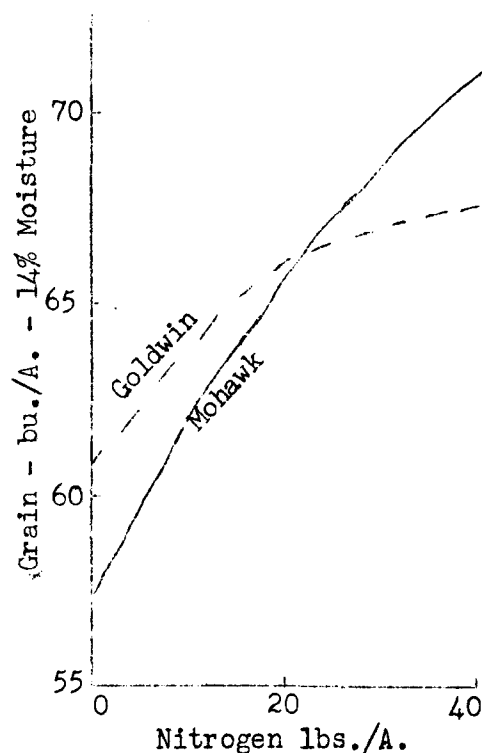
The name "black stem" was proposed by D. D. Poole and H. C. Murphy (Abs. Phytopath. 43: 18. 1952) for a disease of oats which was first named "speckled blotch" by G. F. Weber in 1922 (Phytopath. 12: 449). The "black stem" symptom is conspicuous on the upper leaf sheath and internodal tissues. Attention to this symptomatic response of oats which suggested the name "black stem" appears to have originated with the observations and work of Frances Meehan and H. C. Murphy (Abs. Phytopath. 39: 15. 1949). "Speckled blotch" and "black stem" are caused by Leptosphaeria avenaria G. F. Weber; this organism possesses an imperfect stage, Septoria avenae

Frank, which usually forms in the leaf and stem lesions. On the basis of leaf specimens deposited in the herbarium of the Department of Plant Pathology at Cornell University, it appears that "speckled blotch" of oats has been known to occur in New York State for at least 11 or 12 years. In recent years the "black stem" phase of the disease seems to have become prominent on some varieties of oats. Observations made in New York oat fields, in the summer of 1951, showed that "black stem" is widely distributed and that the new Craig oat variety is relatively susceptible.

Nitrogen Fertilization of Oat Varieties

Sixteen trials over the past four years have shown that Mohawk oats can respond more to higher rates of nitrogen fertilizer than can the Goldwin and Lenroc varieties. Because of the hand harvesting methods used, the differences shown in the graph to the right exclude the importance of the lodging factor which was serious at the 40 lb. level for Goldwin and Lenroc.

Last year Ajax, Craig and Advance were added to the test and the upper rate of N raised to 60 lbs./A. The data tabulated below indicate that there may be an even greater spread in the nitrogen response by varieties than exhibited by the first three. The combine was used to harvest this test so the influence of lodging is partially represented by yield. However, the whole test was harvested when the Mohawk variety ripened to 15% moisture. This means that, had the Goldwin variety which had 22.3% moisture at harvest, remained in the field until dry, its lodging would have been more severe and the percentage of the lodged grain recovered by the combine would have been much less. Other moisture contents were Advance 15.1, Ajax 16.1, Craig 19.7.



Responses of Oat Varieties to Nitrogen Fertilization on
Mardin Silt Loam

1951 - Yield and Lodging

	Pounds Nitrogen per Acre					
	20		40		60	
	Yield Bu. 14%	% Lodged	Yield Bu. 14%	% Lodged	Yield Bu. 14%	% Lodged
Goldwin	104.2	3	112.8	8	97.8	30
Mohawk	92.3	0	100.8	0	107.2	1
Ajax	95.7	0	108.4	6	109.8	18
Advance	83.1	18	86.9	37	86.9	35
Craig	91.2	0	96.1	3	93.4	8

These trials and other studies have led to fertilizer recommendations for oat varieties grouped according to straw stiffness and nitrogen response for various situations in New York. Recommendations obtainable from the Agronomy Department, range from 0 nitrogen up to 35 lbs. per acre on the lower-fertility soils. Fertilization of oats with nitrogen at the higher levels is already an accepted practice on many New York farms.

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NORTH CAROLINA

By G. K. Middleton, T. T. Hebert & W. P. Byrd (Raleigh).

Oat Production Doubles

As an average for the 5-year period just before World War II, 1936-40, North Carolina farmers grew approximately 242,000 acres of oats which produced only 21.1 bushels per acre. Ten years later, 1936-50, the average yield was 30.3 bushels on 378,000 acres. This gave an average production of over 11 million bushels during the latter period as compared with 5 million for the former, according to the Crop Reporting Service, North Carolina Department of Agriculture and the U. S. Department of Agriculture. In 1951 the record was still better - 37 bushels per acre on 402,000 acres. This was the State's highest per acre yield. The use of improved varieties and recommended cultural practices, together with an excellent season resulted in a good crop.

Arlington Oats Continue Popular

The certification of Arlington oats increased from 600 bushels in 1949 to 183,000 in 1951. This is sufficient seed for one-fourth the State's acreage. Since a good portion of the crop has been planted with uncertified seed it is estimated that approximately one-half the 1951-52 crop will be of this variety. This 3-year expansion is thought to be the most rapid ever experienced for a small grain variety in this State.

The yielding ability of Arlington is attested by the fact that it had an average per acre production of 100.5 bushels in 15 tests over the 3-year period 1949-1951. This is in comparison with 92.5 bushels for Atlantic, 77.2 for Fulgrain (strain) and 75.8 for Victorgrain (strain). These data are taken from the 1951 report of the Official Variety Tests in North Carolina. This report should be published in February 1952.

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By J. G. Moseman, U.S.D.A. (Raleigh).

Winter Weather and Mosaic Take Their Toll in the Oat World Collection

2274 entries from the Oats World Collection and 300 new introductions were planted in mosaic infested soil at the Statesville Branch Experiment Station in the fall of 1950. On February 6 when winter survival notes were taken, about 60% of the entries had winter killed. In late March and early April when readings on the reaction to mosaic were made, about 20% of the varieties which had survived the winter had succumbed to mosaic. Although some entries were not completely killed they were so severely damaged that they did not head.

It was observed that some varieties which had been developed and grown in the spring oat belt survived the winter. One group from New Hampshire was outstanding for their ability to survive winter weather. Many of the less hardy winter types were completely killed.

The mosaic infection in the nursery was uniformly severe. The standard susceptible check variety, Letoria, was severely infected. The main varieties now being grown in the southeast were found to be resistant or highly resistant. Some other winter oat varieties, such as Mustang, which have never been outstanding in the southeast, were very susceptible.

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NORTH DAKOTA

By T. J. Conlon (Dickinson).

An "Old Timer" Still in the Picture

Diseases of oats are cause for much concern over much of the United States. Crown rust, stem rust, Helminthosporium Victoriae, mildew and mosaic as well as others known and unknown pose a constant threat, and at times, the battle of the plant breeder vs. mother nature more closely resembles a full scale war.

With this in mind it is interesting to note that there are areas where oat diseases cause very little trouble. Western North Dakota is one of these areas so favored. We offer as evidence to support this statement the fact that Gopher oats, a variety released in 1922 by Minnesota - nearly 30 years ago - is still the highest yielding early oat variety in the Dickinson Experiment Station trials and is perhaps the variety most widely grown by farmers in the Southwestern area of North Dakota. Other varieties of oats finding considerable use in this area include Ajax and Marion early oats and Marida, a midseason variety that was released by Idaho several years ago,

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By V. Sturlaugson (Langdon).

1951 Oat Variety Plot Data

<u>Variety</u>	<u>Date</u> <u>Ripe.</u>	<u>Height</u> <u>Inches</u>	<u>Rust percent</u>		<u>Lodging</u> <u>Percent.</u>	<u>Test</u> <u>Wt.</u>	<u>B./A.</u> <u>1951</u>	<u>5-yr.</u> <u>Average</u>
			<u>Crown</u>	<u>Stem.</u>				
Zephyr	8-19	38	Tr.-5	10-35	15	37.5	120.6	-----
Garry	8-18	35	Tr.	0	5	36.5	118.1	103.9
Exeter	8-21	36	75	Tr.-5	30	36.0	116.6	109.9
Rainbow	8-18	35	25	0	20	36.5	116.3	109.9
Fortune	8-19	37	50	Tr.-5	20	37.5	112.5	-----
Shelby	8-18	35	15	5	10	38.5	107.2	-----
Beaver	8-18	35	10-15	Tr.-5	10	38.5	105.6	94.8
Ajax	8-16	35	25-30	0	40	37.5	105.3	102.0
R.L. 2123	8-21	36	Tr.-5	0	10	37.0	101.6	-----
Clinton	8-14	33	Tr.-5	Tr.	0	37.0	91.3	86.4

Above oat varieties grown on summerfallow-no fertilizer applied.

Medium early maturing Rainbow, late maturing Exeter and early maturing Ajax, are all recommended as good varieties for this area. The Canadian Garry has also maintained a favorable yield record at Langdon, N. Dak. Fortune, another Canadian variety looks promising here. The early maturing Clinton is definitely not recommended due to its low yield record in comparison to the others listed above.

Oat research is conducted on a "rod-row" nursery scale here and then a certain number of the well established standard varieties, along with certain promising new varieties and selections are tested in the triplicated 1/60 acre variety plots. The Rainbow, which is a North Dakota production, a selection from the old Green Russian variety, is the most popular oat in this area. The Canadian varieties Exeter and Ajax are also grown quite extensively in the area.

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OKLAHOMA

By A. M. Schlehuber, T. H. Johnston, R. M. Oswalt & B. R. Jackson
(Stillwater).

Variety X Date-of-Seeding Test

It is well-known that best results can be obtained by seeding winter type oats in the early fall in the winter oat belt and generally it has been believed that best results could be obtained by seeding spring type oats in the spring in this same area. In Oklahoma, the optimum time for seeding spring oats is about February 15 to March 15. Weather records show that during this time there is considerable inclement weather making it difficult and often impossible to seed during this time.

In 1948 a variety x oat date-of-seeding experiment was started to attempt to answer questions about certain winter- and spring-type varieties with respect to optimum seeding dates.

Six varieties ranging in winterhardiness and type of growth were selected, as follows:

<u>Variety</u>	<u>Winterhardiness</u>	<u>Habit of Growth</u>
1. Wintok	Very hardy	Prostrate
2. Tennex	Hardy	Prostrate
3. Stanton Strain 1	Semi-hardy	Semi-spreading
4. Traveler	Semi-hardy	Irregular, mostly semi-spreading
5. Kanota	Intermediate	Semi-spreading to erect
6. Neosho	Spring	Erect.

The first date of seeding was either late December or early January and later seedings followed every two to three weeks, depending on the weather and seedbed conditions.

Data from four years of testing indicate that higher and more reliable yields can be obtained by seeding some of the winter, rather than spring varieties up to and including March 1 at Stillwater. Yields from the mid-March seedings for two of the normally fall-sown varieties, Tennex and Stanton Strain 1, were nearly as good as those obtained from the two spring varieties, Neosho and Kanota. From the late-March plantings, Neosho outyielded Kanota by 8.5 bushels.

It appears, then, that the seeding of certain winter-type oats in late winter and/or early spring is more certain and produces as good or better yields than normal spring type oats from spring seeding. It has the further advantage of allowing two more months, i.e. roughly January and February, in which winter oats can be seeded. Actually, then, winter oats can be seeded in the period September 10 to October 10 and/or from January 1 to March 1.

Winter Hardiness

As noted in the 1950 National Oat Newsletter, 300 foreign oat introductions were seeded in the fall of 1950 at Stillwater for special winter hardiness and disease reaction tests. These strains were received from D. J. Ward of the Division of Cereal Crops and Diseases, Beltsville, Maryland. Of 11 Wintok check rows, eight survived 100%; whereas, only one foreign strain, Z45 Cignee G4-R.48 P. I. 174520, survived 100%. Twenty strains survived between 11 and 99%, 36 from a trace to 10% and 243 were completely winterkilled. One strain Souveraine - R.48 P. I. 174530, even though it survived only 17%, was harvested for further testing because of its good straw, good field appearance, and resistant reaction to crown rust.

New Strains

C. I. 5106, a mass selection made at the Woodward, Oklahoma Experiment Station, is being increased for possible release in the future. Its special features include earliness (from both fall and spring seeding), good winter-hardiness (only slightly less than Wintok), high grazing value, fair to good yield and test weight, better straw than Wintok, and resistance to Victoria blight. It is susceptible to the rusts and smuts. It has been tested in the Special Uniform Winter Oat Experiment and in the Uniform Winter Hardiness Nursery for the past several years.

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By H. C. Young, Jr. & D. F. Wadsworth (Stillwater).

What appeared to be the old "red leaf" disease of oats took on somewhat different manifestations this year at Stillwater. About the time of early boot stage, leaves of Cherokee, Nemaha, Bond X Rainbow (C.I. 4186) and Clinton X Landhafer (C.I. 5864) began to turn red; then, instead of rapidly becoming grey in color, the leaves turned through various shades to rather bright orange, fading out to yellow and then dying. Yields of these four strains were considerably reduced by harvest time. Judging from the kodachrome slides presented by J. W. Oswald and B. R. Houston at the annual meeting of the American Phytopathological Society (See Plant Disease Reporter Vol. 35, No. 11, Nov. 15, 1951), the symptoms observed here on oats very closely resemble the symptoms Oswald and Houston obtained by inoculating oats with the barley yellow-dwarf virus. Certainly there was sufficient similarity to warrant further observation and study along this line.

Several spring type oats which have been resistant to Victoria blight in greenhouse tests have also been quite resistant to crown rust in the field. Among these are several selections of Andrew X Landhafer, and Clinton X Santa Fe (C.I. 5718). Unfortunately, most of these also have been low in yield in the nurseries at Stillwater.

One of the Victoria blight resistant winter oats, a selection from C.I. 4382 X Bonda, has been resistant to crown rust in field tests. However, Victoria blight has never proved damaging on fall sown oats in Oklahoma, so that resistance to crown rust is more important here.

Neither crown nor stem rust was sufficiently severe at Stillwater in 1951 to give a critical evaluation of resistance.

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OREGON

By W. H. Foote (Corvallis).

Oats in Oregon

Oat acreage in Oregon was down from 344,000 acres in 1950 to 289,000 acres in 1951 with a corresponding reduction of 1,213,000 bushels. Yields of oats, both winter and spring, likewise were down in the western and southern parts of the state as a result of a very unusual dry spring and early summer.

Overland, C. I. 4181, has been introduced into the Klamath Basin and is being grown on a considerable acreage by the Tulana and Midland Farms.

Cody, C. I. 3916, has continued its outstanding performance particularly on the irrigated trials in the Snake river valley. Cody will probably be recommended and released from here as soon as seed is available.

Mr. Charles R. Rohde recently joined the staff of the Oregon Agricultural Experiment Station. He will be in charge of the small grain breeding and varietal testing at the Pendleton Branch Experiment Station, Pendleton.

The writer has available a small amount of seed of a Avena sativa orientalis (side oat) selection that will be available for anyone wishing to grow some for class room purposes. This oat was selected by a grower and increased by him. It is a very characteristic side oat.

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TENNESSEE

By N. I. Hancock (Knoxville).

The Agricultural Engineering Department has added a labor-saving equipment for planting plots of small grains. An old Van Brundt 5-row drill planter is stripped down and made to fit in front end of Allis Chalmers G tractor. With hydraulic lift and small air compressor built on tractor, two men planted in a single day 40 different varieties in 4 replicates, or 160 drill plots. Pictures showing this mechanism will be sent anyone upon request. Note: These Van Brundt planters are no longer manufactured and must be obtained from farmers who have bought them in the past.

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TEXAS

By I. M. Atkins (Denton).

Oat Improvement Work in Texas in 1951

Small grain production in Texas in 1951 was the smallest since 1935 owing to low temperatures, severe fall and winter drought and these combined with attacks by greenbugs and crown root aphids. The deficiency in precipitation has continued to the present so that

prospects for 1952 are discouraging. Diseases were not factors in yield in 1951 but the widespread occurrence of race 7 of stem rust has reduced the value of much breeding material. Fortunately we have a considerable number of advanced strains carrying the Hajira-Joanette resistance to stem rust and some of these may be released soon.

Several new crosses were made to meet the problems presented by the changes in the disease picture and the F₁ plants grown at Aberdeen during the summer of 1951. Resistant progenies from these crosses will be advanced to the testing stages as fast as possible.

Tolerance to the abrupt changes in temperature encountered under Texas conditions continues to be a major problem. The adaptability of Mustang to these hazards was well exemplified at Iowa Park in 1951 where Mustang produced 44.1 bushels per acre compared with 3.0 for New Nortex. A sister strain of Mustang, C. I. 5871 is red seeded and even more promising than Mustang for these conditions. The acceptance of Mustang by farmers has been good, although only rather limited increase of the variety was possible because of the unfavorable season.

An adaptation of the multicell fertilizer and seed distributor described in the Agronomy Journal 43: 511-512, Oct. 1951 was successfully used on an Allis Chalmers G tractor for planting experimental grain this season. This small tractor and 4 row planting unit is much better adapted to nursery planting than the larger unit and packs the soil less.

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UTAH

By R. W. Woodward (Logan).

Although no oat hybridization work is being done at the Utah Station we have been abundantly supplied with superior, high yielding, disease resistant varieties during the past 20 years. The oat acreage is about equal to that of spring wheat with continuing increases in yield per acre making oats a better competitor than was reported in 1936 when grain crops were compared.

This past year Utah joined in a cooperative release of Cody which has given even better yields than Overland. Uton is now losing ground to the newer varieties with shorter stiffer straw and increased resistance to disease.

There is some question as to how well Cody will be accepted due to its slightly yellow lemma since the farmers have been

so partial to white oats.

This station does wish to compliment the oat breeders responsible for our well adapted high yielding varieties. It has permitted more work to be done here on other problems which can't be done so well on a regional basis.

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VIRGINIA

By T. M. Starling, Ed Shulcum & C. W. Roane (Blacksburg).

Oat Varieties Recommended for Planting in 1952

The Agronomy Department held its annual staff meeting early in January at which time varietal recommendations for 1952 were made. Recommendations for oat varieties were based on results of rod-row tests conducted at 10 locations throughout Virginia. A variety must be yield tested for a minimum of two years and must have met certain minimum standards in performance before it is eligible for recommendation.

Andrew and Clinton were recommended for planting in the spring of 1952 in the Piedmont section and the area west of the Blue Ridge. Benton was dropped from the recommended list. Spring oats are not recommended for the eastern section of the state.

The varieties recommended for fall seeding in the area west of the Blue Ridge were Forkeddeer, Lee, and Atlantic, and Arlington for the low elevations of Lee and Scott counties. Arlington, Atlantic, Lee, Forkeddeer, and Letoria were recommended for the Piedmont area. Letoria will not be recommended after 1952. This is in keeping with the practice of giving one year's notice before dropping a variety from the recommended list. Arlington, Atlantic, Lee, Letoria, and Stanton were recommended for Eastern Virginia. Letoria and Stanton will be dropped from the list after 1952.

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WASHINGTON

By F. C. Elliot (Pullman).

Two new spring oat varieties, Cody (C.I. 3916) and Shasta (C.I. 3976), continue to look outstanding in eastern Washington. In Pullman rod-row nurseries over the past five-year period Cody and Shasta have averaged 108 and 118 bushels per acre, respectively,

while Markton yielded 101 bushels. Cody has also been outstanding under irrigation at Prosser, where its short straw and high yields make it particularly attractive.

High yields of oats locally are not an indication of commercial production, however, since no important market is as yet available. Favorable local growing conditions, including absence of foliar and soil-borne diseases generally, might be exploited to regional and national advantage in future seed increased of varieties for other areas.

An oat breeding program is not justifiable here at present although promising new selections from breeders would be welcomed for testing.

* * * * *

WISCONSIN

By H. L. Shands (Madison).

Oat yields on Wisconsin farms in 1951 averaged 49.5 bushels per acre or 1.5 less than the all-time high of 1945. The season was late in starting and finishing. Rainfall was sufficient and temperatures were lower than average except for May. Harvesting was hampered by adverse moisture, and storage trouble developed. Some grain spoiled in the bin and viability was lowered as evidenced by reduced germination per cent.

Diseases probably caused less damage in 1951 than in 1950. Crown rust was observed in most sections of the state, but in no case did the writer think that yield was reduced in 1951. Stem rust was less than in 1950. The leaf-spotting phase of "dark stem" was more evident than in recent years. Darkened stems seemed to occur more frequently than in other years. Very little "Red leaf" was seen.

The new Branch variety from the cross Forward x (Forward x Victoria-Richland) was released in 12 - 36 bushel lots to 275 seed producers who planted about 3300 acres. A total of 150,000 bushels of certified seed is available for sowing in 1952.

In preliminary observations selections from the crosses Garry x Hawkeye-Victoria and Beacon x Hawkeye-Victoria suggested moderate promise.

Selections from C.I. 4763, C.I. 4766 and C.I. 4795 continue to show adult plant resistance to crown rust. Selections from C.I. 4763 were free from smut in 3 replications following inoculation.

C.I. 4766 and C.I. 4795 selections were smut susceptible. C.I. 4795 probably resists stem rust. These selections are late in heading and maturity.

Seed of most of the C.I. oat collection and about 250 new introductions was provided by Mr. David Ward of Cereal Introductions. A four-foot row of each selection or introduction was sown and later subjected to artificially created epiphytotics of crown and stem rust of mostly races 45 and 8 respectively. The following notes were taken for most of this nursery: heading date, crown rust pustule size and coverage, stem rust coverage, and height of mature plants. Many selections will be observed again in 1952 for agronomic and disease reactions. Other than varieties commonly known to plant breeders, those listed below gave promise because of their apparent adult plant rust resistance. P.I. 174544 is momentarily one of the most promising of the group.

C.I. 1712	C.I. 3032	C.I. 3038	C.I. 5167	P.I. 174544
C.I. 1928	C.I. 3033	C.I. 3039		P.I. 174545
C.I. 3030	C.I. 3034	C.I. 3040	P.I. 174538	P.I. 177795
C.I. 3031	C.I. 3037	C.I. 5083	P.I. 174539	P.I. 183600

Since there is an urgent need of using new breeding stocks as early as possible in oat improvement programs it seemed unwise to withhold this information. Therefore the above list of the more promising selections is made available until such time of a more nearly complete publication. The seed supply is small, but a limited amount will be sent upon request. The writer has been greatly aided by Dr. D. C. Arny, Steve Lund, Charles M. Brown and Robert Forsberg.

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V. EDITORIAL COMMENT

By N. F. Jensen (Ithaca).

The Oat Newsletter is what its readers make it by contributing what they consider worthwhile. We welcome the articles from Canada and hope that there will be more next year. All in all, the 1951 issue is larger than the 1950 Newsletter with 51 separate articles contributed by 77 persons. The Newsletter will be mailed to a list of 147 persons in the United States and Canada. The editor wishes to thank all those who sent in articles, for the careful preparation of their news items, and especially to express appreciation to the Quaker Oats Company through Mr. Dallas Western for "picking up the check."

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VI. ERRATA

In the 1950 National Oat Newsletter (Vol. I), page 39, under "Early Generation Material Available", interchange the words "Male" and "Female".

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