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Ithaca, New York

1962

OAT NEWSLETTER

Vol. XIII

April 1, 1963

Sponsored by the National Oat Conference

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Edited and multilithed in the Department of Plant Breeding, Cornell University, Ithaca, New York. Costs of preparation financed by the Quaker Oats Company, Chicago, Illinois.

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Neal F. Jensen, Editor

ANNOUNCEMENTS

Overseas contributions - Foreign contributors are urged to anticipate the annual preparation of future newsletters and to submit articles or notes to the editor at any time of the year without waiting for the call for material.

Back issues - Back issues of the 1960 and 1961 Newsletters, plus a few copies of certain earlier editions, are available on request.

Literature section - A volunteer or volunteers are needed to do an annual compilation of literature on oats. At present a haphazard, incomplete job is being done. Any volunteers?

Plant breeding series - "Procedures used in the oat breeding project at Cornell University" in this issue could be the first in a series written by different oat breeders. Is there a volunteer for the 1963 Newsletter?

Variety descriptions - The editor has reason to believe that the Newsletter is occasionally used as a reference to furnish details of information about recently released varieties. Frequently, this information is of a fragmentary nature. Would oat breeders be willing to improve the New Variety section, beginning with the 1963 Newsletter, by submitting a separate, more complete description of each new variety which could be printed in this section?

Newsletter dimensions - Our bookshelf shows that the 12 volumes of the Oat Newsletter vary in size. Binding and trimming of the Newsletter is "farmed out" and we had not thought to check this point. Perhaps this just proves that we are truly an informal publication with a certified amateur status.

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I. CONFERENCE AND REGIONAL NOTES

*** Secretary's Report - National Oat Conference ***

The one meeting of the Executive Committee of the National Oat Conference held in 1962 was reported in the 1961 Oat Newsletter (March 1, 1962, Vol. XII, pp. 1-2).

Several regional meetings of oat workers were held at Gainesville, Florida, January 23-25, 1962 at which some changes in regional representatives to the National Committee were made.

Late in 1961 and early in 1962 an election was held by mail ballot and John E. Grafius was elected Chairman to succeed W. H. Chapman. It is expected that Dr. Grafius will serve until after the next National Oat Conference, the date for which has not been determined.

As of January, 1963 the personnel of the Executive Committee of the National Oat Conference is as follows:

Northeastern Region	Steve Lund, N. F. Jensen
North Central Region	C. M. Brown, John E. Grafius (Chairman of National Conference) and Dale A. Ray
Western Region	Harland Stevens and Calvin Konzak
Southern Region	W. P. Byrd and Chas. F. Murphy
Cereal Branch representative	L. A. Tatum
Oat Section representative	H. C. Murphy
Editor of Oat Newsletter	Neal F. Jensen
Secretary	Franklin A. Coffman (Retired)

During the year Vol. 12 of the Oat Newsletter was received. This publication is assembled and edited by Neal F. Jensen and the processing is done at Cornell University. The preparation of the publication is doubtless time consuming. The cost of this publication has for years been borne by the Quaker Oats Company of Chicago of which Dallas E. Western is a director. The oat scientists of America are much indebted and very grateful to these men and these institutions for those copies of the Oat Newsletter they receive each year.

The secretary of the National Oat Conference Committee, because of his retirement from the U.S.D.A., will, with this report, end his tenure of service as secretary. At this time he wishes to express his sincere thanks to the different chairmen under whom he has served during the organization of the conference and in the years since; to the many members, past and present, of the National Conference Committee and to all oat workers for their helpful assistance and interest. To have served as secretary for almost 15 years has been a most gratifying experience and the writer leaves the assignment confident that the National Oat Conference will become an increasingly potent and helpful influence in matters relating to oats in America.

Franklin A. Coffman
Secretary to Committee (Retired)

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*** Thomas Ray Stanton ***
(1885 - 1962)

Thomas Ray Stanton, who retired in 1951 as Senior Agronomist in Charge of Oat Investigations of the U.S.D.A., died in his sleep at his home in Hyattsville, Maryland, November 14, 1962. Dr. Stanton, for several years following retirement from the government, was very active in oat work but in more recent years had been in poor health.

Dr. Stanton was born September 23, 1885 near Grantsville, Maryland, son of William T. and Anna (Durst) Stanton. He was reared on the family farm and attended the public schools in the Grantsville area. On October 23, 1913 he married Pearl Marguerite Gude, and their only child a son, Dr. William Alexander Stanton has for many years been connected with the E. I. DuPont Company.

Stanton attended the University of Maryland graduating with the B.S.A. degree in 1910 and later in 1921 received his M.S. degree from the same institution. In 1945 Iowa State University conferred on him the honorary degree of Doctor of Agriculture in recognition of his outstanding contributions to American agriculture. The American Society of Agronomy elected him a Fellow of the Society in 1943.

Dr. Stanton served one year, 1910-11, as assistant in agronomy at the Maryland Experiment Station. Late in 1911 he joined the U. S. Department of Agriculture and from 1911 to 1915 served as scientific assistant and later assistant agronomist in charge of the cereal experiments on the U.S.D.A., B.P.I., Arlington Experiment Farm in Virginia across the Potomac from Washington. He became agronomist in oat investigations in 1915 and was placed in charge of oat investigations in 1922. In 1928 he was advanced to Senior Agronomist in Charge of Oats which position he held until retirement in 1951. After retirement from federal service he continued to be active making valuable contributions to oat literature as well as serving as a consultant with the Coker's Pedigreed Seed Company of Hartsville, South Carolina.

During his career, Dr. Stanton made numerous contributions of great value both in the field of technical knowledge of oats as well as of economic value to American agriculture. Among his scores of publications his "Oat Identification and Classification" (U.S.D.A. Tech. Bul. 1100) and "Superior Germ Plasm in Oats" (U.S.D.A. Yearbook for 1936) are outstandingly notable in the literature on oats. The many U.S.D.A. farmers bulletins and scientific papers of which he was an author have long been used and widely referred to.

Dr. Stanton believed in the cooperative approach to the solution of agricultural problems. He was responsible for the origin of the first cooperative uniform oat nursery, the oat rust nursery, and pioneered a uniform smut testing and the soil-borne oat mosaic nursery. As Agronomist in Charge, the cooperative oat yield and uniform winter-hardiness oat nurseries were initiated with his approval. For some 30 years he maintained the World Collection of Oats in the U.S.D.A. His carefully kept records and the care he exercised to keep seed supplies pure and correctly labeled proved of inestimable value to oat

scientists of this and other countries.

In the economic field contributions made by himself and his co-workers proved of tremendous value at a critical time for American agriculture. In 1930 he pollinated the crown rust resistant South American oat Victoria with pollen from the then important Corn Belt variety Richland and obtained a single crossed seed. In the next decade, in cooperation with others in U.S.D.A. and State Experiment Stations, the crown rust, stem rust and smut resistant varieties Boone, Tama, Vicland, Vikota, Cedar and Control as well as many strains used in further crosses were selected. Crosses of Victoria by co-workers were made in 1930 which resulted in crown rust resistant oats for the South and numerous varieties became available for farm production in both the north and south in the early 1940's.

The timeliness of the release of these varieties was almost without parallel in the history of American agriculture. These were the years of World War II and within a span of some 5 years, 1941-1945, the expansion of Victoria extended to some 80 percent of the oat acreage of the country. It was estimated that the total value of the increased yields resulting from growing these varieties exceeded a half billion dollars in the war years. Whereas the six varieties listed have about disappeared from American farms due to their susceptibility to Victoria blight, strains of Stanton's original cross were much used by hybridists and additional varieties resulted which are still being grown.

Apparently, Stanton's second most notable contribution to oats, from the economic standpoint, came as the result of his crossing Winter Turf with Aurora in 1916. Few oat crosses that later resulted in varieties had been made in the United States previous to 1916 and this was the first cross of note between fall sown varieties. In Lee, derived from the above cross, the desired characters of the parents were combined to an exceptional degree and an entirely new winter oat type resulted. Lee has remained of economic importance for over 30 years and is a progenitor variety of most of the winter oats that have been and still are grown in the cooler areas, Piedmont and elsewhere, of the South. In the last quarter century at least half of the winter oat varieties grown in this country trace to Lee or Lee derivatives.

Although Dr. Stanton made many additional contributions both in the economic and the scientific fields, the above were so outstanding that American agriculture, oat scientists, crop teachers and extension workers will remain much indebted to him for many decades to come.

by F. A. Coffman

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*** History of National Oat Conference ***

Franklin A. Coffman

In 1963 the National Oat Conference is in its fifteenth year. Its organization had been preceeded by some years by similar conferences in other cereal crops.

The origin of the Conference resulted to a large extent because of the difficulty in arranging for adequate sectional meetings exclusively on oats at Annual Meetings of the American Society of Agronomy. Attempts had been made as early as in 1946 at the Annual Meetings at Omaha, Nebraska to hold conference-type meetings for the oat workers. Such a meeting, held at night at Omaha, was attended by some 80 interested oat workers. It continued until very late in the evening. In the next three years interest developed rapidly for organizing a special conference for oats, along the same general lines as those previously formed for wheat, barley and corn.

Most prominent in stimulating this interest and bringing it to fruition was Dr. H. L. Shands of the University of Wisconsin who, on consulting with Dr. K. S. Quisenberry then in charge of the Cereal Branch of Crops Research, U.S.D.A. brought the matter to a focus before a sectional meeting being devoted to oats at the Annual Meetings of the American Society of Agronomy held at Milwaukee, Wisconsin, Oct. 24, 1949.

After some discussion at that meeting the oat workers in attendance, on motion by Dr. Quisenberry, elected Dr. Shands to act as temporary chairman and directed him to appoint a committee of 5 to consult with Dr. Quisenberry and Dr. Shands for the purpose of exploring the idea of organizing a National Oat Conference. They were instructed to make known to the oat workers the result of their deliberations not later than the next annual meeting of the Agronomy Society. Those appointed on this temporary committee were:

R. M. Caldwell	H. C. Murphy	D. W. Robertson
F. A. Coffman	D. A. Reid	

This group held a meeting almost immediately following their appointment and discussed the matter of an oat conference at some length. F. A. Coffman was designated by those present to record the decisions of the committee.

These were set forth by K. S. Quisenberry, "Report of the Oat Conference" Milwaukee, Wisconsin on October 24, 1949.

Your committee, authorized to explore the possibilities of forming a national oat conference has met, and following some discussion of various phases of the question is now ready to report their views as follows:

1. That a National Oat Conference Committee should be organized, such committee to encourage regional as well as national conferences for the discussion of the improvement of the oat crop and to serve in a supervisory capacity in matters regarding national conferences.

2. That this conference committee should consist of representatives of the different oat growing regions of the country and of the Division of Cereal Crops and Diseases of the U. S. Department of Agriculture.

3. That in addition to the seven undersigned members, authority be given for the appointment of a representative from the Northeastern States, and possibly one additional committee member, making a total of nine in all.

4. That the officers of this committee should be chosen by the committee members and that these officers should consist of a chairman to serve for one year, and a permanent secretary.

These recommendations were presented to the oat workers. They were voted on and unanimously accepted by the some 50-60 oat workers in attendance. In pursuance of the recommendations made by the temporary committee, Dr. Shands appointed T. R. Stanton and N. F. Jensen to serve as additional members of the committee. It was decided by the committee, as then constituted, that K. S. Quisenberry should be asked to supervise and conduct an election among the committee members to choose a Conference Chairman and Secretary. These elections were held during the next few weeks by mail ballot and H. L. Shands was elected Chairman and F. A. Coffman, Secretary. Following the election the committee proceeded under Dr. Shands' leadership with organizational matters, and in Vol. 1 Oat Newsletter (1950) a "Message" by K. S. Quisenberry to the National Oat Conference, a "Statement" by the Chairman, H. L. Shands and "Notes" by the Secretary, F. A. Coffman to oat workers appear outlining the plans for the future of the National Oat Conference as accepted by the oat workers attending an oat sectional meeting of the American Society of Agronomy held at Cincinnati on November 2, 1950.

It had been decided, by vote, that the Executive Committee should include 2 members from each of the South, Northeast and Western regions; 3 from the North Central region and 2 or 3 from the Cereal Division of the U.S.D.A. The Committee as of December, 1950 included the following:

R. M. Caldwell
F. A. Coffman (Secretary)
N. F. Jensen
H. C. Murphy
T. R. Stanton
K. S. Quisenberry
D. A. Reid
D. W. Robertson
H. L. Shands (Chairman)

In the spring of 1951 an election was held by mail ballot and as a result T. R. Stanton was elected to succeed H. L. Shands as Chairman of the National Oat Conference.

No meetings of the Conference were held in 1951 but during the year members were elected to fill the position on the committee from all regions except that no second member was elected from the Western states.

In 1952 the National Oat Conference held a one-day meeting at the Netherlands-Plaza Hotel in Cincinnati, Ohio with T. R. Stanton serving as chairman. Probably 100 attended the conference and Neal F. Jensen was elected by the Executive Committee to serve as chairman for 1953. At that conference a committee was appointed by the incoming chairman to consider the question of an Oat Monograph. Members of that committee were J. M. Poehlman, K. J. Frey, H. L. Shands and T. R. Stanton.

In 1953 no meetings of the Conference were held but several sectional meetings were conducted and several changes in the National Committee were reported.

On November 11, 1954, at Hotel Lowry, St. Paul, Minnesota, a lengthy night conference meeting of oat workers was held with some 100 in attendance. Called to order at 7:30 P.M. by the Chairman, N. F. Jensen, the meeting lasted until 12:25 A.M. November 12. Numerous matters were discussed at some length and with considerable vigor. That was the last attempt of the National Oat Conference to hold a conference in connection with the Annual Meetings of the American Society of Agronomy and it was voted at that meeting for the Conference to hold its meetings separately thereafter. During the meeting the Executive Committee announced that it had elected K. J. Frey to succeed N. F. Jensen as Chairman of the Oat Conference.

In 1955 no meetings of the Conference were held but two committees, appointed by the Chairman, K. J. Frey, were active and reported. The Oat Monograph Committee including W. H. Chapman, F. A. Coffman, (Chairman), K. J. Frey, H. L. Shands, N. F. Jensen and H. C. Murphy met at Ames, Iowa, November 9, 1955, drew up an outline for the Oat Monograph and selected authors for the several chapters. F. A. Coffman was elected to be editor of the Monograph.

The second committee appointed was for presenting plans for the future conduct of the affairs of the national Oat Conference. This included N. F. Jensen (Chairman), M. D. Simons, A. M. Schlehuber and F. A. Coffman. A statement as to their deliberations appears in Oat Newslwetter, Vol. VI, pp. 1-2. They outlined (1) the future organization of the Conference, (2) the future membership of the Executive Committee, (3) the tenure of office of the Chairman, (4) the approximate frequency of the Oat Conference Meetings, and (5) gave official recognition to the Oat Newsletter which would thereafter be sponsored by and be the official publication of the Conference.

In 1956 and 1957 no meetings of the National Oat Conference were held, but a mail ballot was circulated to oat workers by the Chairman to determine their wishes as to the time of and plans for the next Conference meeting. It was decided that the Conference would meet at Lafayette, Indiana in January, 1958. In December, 1957 ballots were mailed and an election held to select the next Conference Chairman. As a result, W. H. Chapman of Quincy, Florida was elected.

In 1958 the first conference specifically limited to oats was held by the National Oat Conference at the Memorial Union, Purdue University, Lafayette, Indiana from January 29 to 31. About 100 attended the Conference which was welcomed to the Purdue campus by Dr. J. R. Shay, Head of the Botany and Plant

Pathology Department. The program and the minutes of those meetings are included in Oat Newsletter, Vol. VIII. The Chairman, K. J. Frey, reported two matters voted on by those oat workers (30-40) present and in attendance at the business meeting of the Conference: (1) that hereafter oat yields would be reported in pounds per acre and (2) the newly elected, incoming Chairman, W. H. Chapman was to appoint a committee to adopt standard genetic symbols for oats.

Members of that committee appointed by the new chairman were:

M. D. Simons (Chairman)
F. L. Patterson
W. M. Myers
N. F. Jensen
E. G. Heyne

The first National Oat Conference banquet was held January 30, with some 80 in attendance. The Chairman, K. J. Frey, after he had traced briefly the history of the Conference, introduced the ladies, the officials of the Agronomy and Pathology Departments of Purdue University present, and the officers of the National Oat Conference. He also introduced Dr. R. M. Caldwell who in turn introduced Earl L. Butts, Dean of the School of Agriculture of Purdue University, who gave the address of the evening.

As seen from Oat Newsletter Volumes IX, X and XI, no meetings of the Oat Conference were held in 1959, 1960 or 1961. However, several matters of importance to the Conference occurred during those 3 years. A comprehensive report of the committee on genetic symbols for oats was prepared by the committee members listed above. This report appears in Oat Newsletter, Vol. X published March 1, 1960.

Also, the chairman of the Oat Monograph committee, Franklin A. Coffman, reported in Oat Newsletter, Vol. XII published March 1, 1962, that the Oat Monograph which had been sponsored by the Oat Conference had finally appeared in print in July, 1961. He stated the book included 15 chapters, 138 illustrations and 650 pages. It was pointed out that about 5 1/2 years had elapsed from the time the book was first outlined by the Monograph Committee at Ames, Iowa in 1955 until the final proofs had been sent to the Agronomy Society Editor.

Those contributing to chapters were:

O. T. Bonnett
Ralph M. Caldwell
W. H. Chapman
R. G. Dahms
K. J. Frey
W. R. Graham
Neal F. Jensen
Franklin A. Coffman
A. A. Johnson
H. C. Murphy
Joseph G. O'Mara
H. L. Shands
M. D. Simons
T. R. Stanton
Dallas E. Western

Although no meetings of the National Oat Conference were held for 3 years, the National Oat Conference had been invited to meet on several University campuses. To make a decision in the matter a meeting of the Executive Committee was called by the Chairman, W. H. Chapman, at the time of the Annual Meetings of the American

Society of Agronomy, at Hotel Morrison in Chicago in November, 1960. The members present favored holding the next Conference at Gainesville, Florida late in 1961 or early in 1962. Acting on this decision W. H. Chapman, Conference Chairman, after contacting oat workers and Experiment Station officials, prepared a program for the Conference which was held January 23-25, 1962 on the campus of the University of Florida, Gainesville, Florida.

About 80 attended the Conference at Gainesville. They were welcomed to the University campus by Dr. J. Wayne Reitz, President of the University. More specific details of those attending as well as the minutes of the Conference appear in 1961 Oat Newsletter, Vol. XII published March 1, 1962. Among matters discussed at the Florida Conference was the report of the special committee, which had been appointed by the Chairman, W. H. Chapman, in accordance with the action of the Conference at its meeting in 1955. This committee presented, at Gainesville, a report of its decisions with respect to future policies regarding the Oat Newsletter. The committee included N. F. Jensen (Chairman), K. J. Frey, J. M. Poehlman and T. M. Starling, and the policies proposed by them and accepted by the Conference are specifically outlined in the 1961 Oat Newsletter, Vol. XII published March 1, 1962.

The second National Oat Conference banquet was held the evening of January 24 at the Student Service Center on the campus of Florida University with the Conference Chairman, W. H. Chapman, presiding.

Among those introduced by the Chairman to the group assembled were Doctors G. K. Middleton, John W. Sites, H. H. Willowski, E. L. Grinter and Phil Clayborne, and the Mmes. D. E. Western, J. M. Poehlman, D. A. Ray, R. I. H. McKenzie and Phil Clayborne. Later the Chairman introduced Dr. K. S. Quisenberry, one of the founders of the National Oat Conference, who presented F. A. Coffman, soon to retire, a bound volume of letters from friends and associates throughout this country and Canada. The Chairman, W. H. Chapman, then presented Dr. G. K. Middleton of North Carolina, recently retired, a volume of letters from his many friends and co-woerkers of the United States and elsewhere. He announced that similar volumes of letters had been prepared for Dr. O. T. Bonnett, soon to retire from the University of Illinois, and for Prof. N. I. Hancock to retire in 1962 from the University of Tennessee, but as neither was present he stated the books would be mailed to them.

Mr. Chapman also introduced to those attending the banquet Dr. John E. Grafius of Michigan State University and announced that as a result of an election held by mail among members of the Executive Committee of the National Oat Conference, Dr. Grafius had been elected to become the next Conference Chairman and would be installed the next day.

Dr. E. L. Grinter, Dean of the Graduate School, University of Florida, was presented to the group by the Chairman, W. H. Chapman, and he introduced Mr. Phil Clayborne, connected with the Saturn Project of Cape Canaveral, who gave a very interesting talk, illustrated by slides, on the firing of Saturn Rocket.

After the National Oat Conference, held in Florida, no matters of special interest to the oat workers occurred in 1962.

Since the National Oat Conference was first organized in a preliminary way in 1949, six men have served as Chairman, one as Secretary and one as Editor of the Oat Newsletter. A total of 30 oat workers have been officially connected with the Executive Committee of the National Oat Conference since it was organized some 15 years ago.

Officers of National Oat Conference

1949-1963

Chairmen	State	Year Elected
H. L. Shands	Wisconsin	1949
T. R. Stanton	U.S.D.A.	1951
N. F. Jensen	New York	1952
K. J. Frey	Iowa	1955
W. H. Chapman	Florida	1958
John E. Grafius	Michigan	1962

Dr. Shands was at first the temporary and later the first permanent chairman. K. S. Quisenberry acted in the capacity of chairman in conducting the election of the first Conference Chairman and Conference Secretary.

Members of Executive Committee

1950-1963

North East	State	North Central	State	North West	State
		Ralph Caldwell	Ind.	Fred Elliott	Wash.
C. S. Bryner	Pa.	John E. Grafius	Mich.	C. Konzak	
		K. J. Frey	Iowa	D.W. Robertson	Colo.
Steve Lund	N.J.	E. G. Heyne	Kans.	H. Stevens (USDA)	Ida.
N. F. Jensen	N.Y.	H. C. Murphy (USDA)	Iowa		
Lincoln Taylor	Me.	Fred L. Patterson	Ind.		
		J. M. Poehlman	Mo.		
		Dale A. Ray	Ohio		
		H. L. Shands	Wis.		

Southern	State	U. S. D. A.	Non-Voting Officers
I. M. Atkins (USDA)	Tex.	K. S. Quisenberry	Editor, Oat Newsletter
W. P. Byrd	S.C.	H. A. Rodenhiser	N. F. Jensen - N.Y.
W. H. Chapman	Fla.	L. A. Tatum	
D. D. Morey	Ga.	H. C. Murphy	Secretary, F. A. Coffman
Chas. F. Murphy	N.C.		USDA
D. A. Reid	Ky.		
A. M. Schlehuber	Okla.		
T. M. Starling	Va.		

No history of the National Oat Conference would be complete without stating that starting with Volume II the cost of publication of the Oat Newsletter sponsored by the Conference has been financed by the Quaker Oats Company of

Chicago, Illinois. Arrangements for this financing have been made by Dallas E. Western, Director, Grain Development and Agricultural Relations. Volume I was financed by Cornell University.

In addition, the monograph Oats and Oat Improvement previously mentioned was originally sponsored by the National Oat Conference and later received the sponsorship and support of the American Society of Agronomy.

Franklin A. Coffman, Ex. Secretary

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II. SPECIAL REPORTS

*** The 1962 Oat Crop ***

by H. C. Murphy, USDA

A record high yield and outstanding high-test-weight oat crop was harvested in the United States in 1962 from the smallest average for grain since 1884. The record high average yield of 45.0 bushels per acre obtained in 1962 compares with the second, third, fourth, and fifth highest yields of 44.5, 43.3, 42.2 and 38.3 bushels obtained in 1958, 1960, 1961, and 1955, respectively. There were no widespread epiphytotics of oat diseases, although locally severe epiphytotics of barley yellow dwarf virus, crown rust, and Septoria were reported. Weather conditions were generally favorable, but not exceptionally good, for oats in the heavy grain-producing areas. Dry weather resulted in short straw and reduced yields in portions of the Northeastern and Southeastern Regions. Early freeze damage and drought later in the season caused appreciable reductions in yield in portions of the Southern and South Central Regions.

The U.S. oat acreage, average yield, and total production by decades since 1871 and for the last five years are as follows:

Period	Acreage 1,000's	Yield Bu. per acre	Production 1,000's bu.
1871-80	13,890	29.0	361,664
1881-90	23,741	27.5	649,863
1891-00	29,436	28.1	826,992
1901-10	33,495	28.8	965,037
1911-20	39,315	31.3	1,234,052
1921-30	41,354	30.0	1,218,833
1931-40	36,211	27.8	1,012,349
1941-50	39,667	33.0	1,310,733
1951-60	35,128	37.1	1,222,369
1953-62	32,334	38.9	1,234,050
1958-62	26,844	42.5	1,135,171

The 1962 U.S. oat acreage of 22,934,000 acres was 50 percent of the record high of 45,539,000 acres grown in 1921, and 54 percent of the 42,291,000 acres grown in 1954. The striking reduction in acreage since 1954 seems to have slowed up somewhat between 1961 and 1962. In fact, in a few States, such as Indiana, North Dakota, South Dakota, and Ohio, the 1962 oat acreage held its own or was slightly increased over 1961. What the future holds for oats is uncertain. The record or near record high oat yields obtained during the past few years, along with even stiffer-strawed, higher-test-weight, and more disease-resistant varieties continually becoming available, should help to reverse the downward trend in oat acreage.

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*** Physiologic Races of Oat Stem Rust in the United States in 1962 ***

by D. M. Stewart, R. U. Cotter, Bill J. Roberts
Cooperative Rust Laboratory, University of Minnesota

Among 187 isolates of oat stem rust identified in the Cooperative Rust Laboratory at St. Paul, Minnesota, to December 21, race 6 comprised 66 percent of the isolates; race 7A, 14 percent; race 7, 8 percent; race 2, 7 percent; and other races, 5 percent. As in 1961, race 6 predominated. This race and the closely related race 13 attack varieties with the White Russian and Richland types of stem rust resistance. Some of the commercial varieties susceptible to this race are Andrew, Ajax, Bonda, Cherokee, Clinton, and Mo-0-205. Some cultures of race 6 identified in 1962 appear to have a wider spectrum of virulence on seedlings of some genotypes of oats than cultures of race 6 in previous years. In 1962, most isolates of race 6 produced mixed infections of resistant- and susceptible-type pustules on seedlings of some of the supplemental varieties, e.g. Garry, Burnett, Rodney, and C.I. 4023. Single-pustule separations from the susceptible-type pustules on these varieties usually produced the same mixed infection types. Prior to 1962, race-6 cultures usually produced a resistant homogeneous reaction on these varieties. Studies are now being made to compare the 1962 isolates with those of other years.

Race 7A, the next most prevalent race, was identified in the central part of the country from Texas northward, where it comprised 18 percent of the isolates. This race can attack oat varieties (e.g. Rodney) with the so-called Canadian type of stem rust resistance at both low and high temperatures.

Race 6A was identified 5 times near barberry in New York State. This race can attack virtually all commercial oat varieties that are dependent on the Richland, Canadian, White Russian, and Jostrain types of stem rust resistance. Race 4A, which can attack all varieties that are dependent on the Richland, Canadian, and White Russian resistance, was found in Minnesota. The varieties Burnett, Garry, and Minhafer are attacked by this race.

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*** Procedures Used in the Oat Breeding Project at Cornell University ***

by Neal F. Jensen, Department Plant Breeding
Cornell University, Ithaca, N.Y.

Philosophy and Objectives

An overall objective is to smooth the frequent wide swings in oat production in New York by countering the hazards responsible for the variability in crop response. It is recognized that crown rust and stem rust are two of the principle offenders. A two-stage program to accomplish this objective involves:

1. a planned frequent release of varieties from different breeding backgrounds. It is hoped that farmers, through free choice from the list of available varieties, will thereby establish a random crop pattern of genetic barriers over the state. The fifth and sixth entries in this program of creating the needed genetic barriers are currently under research evaluation and three varieties have already been released.

2. the introduction of multiline varieties to supplement standard varieties in the geographical area.

There is also a recognition of the necessity of meeting the needs of the better farmers (that is, the only ones who can continue to operate at a profit in the competitive, high cost economy). Oats are generally a low-income crop and it is believed that, in addition to general all-purpose varieties, the plant breeder must supply varieties which incorporate features that provide an advantage to a grower under a special set of conditions. These special features may relate to maturity, height, quality, forage yield, disease resistance or the like. Each such special variety may have an apparent limited acreage but if we fail to provide such tailor-made varieties the decline in oat culture undoubtedly will proceed at a more rapid rate and to a lower level.

Crossing Procedures

The Hybrid Hybridizing is concentrated in the greenhouse in the winter and spring because of the greater availability of time. About 25 different parents are used in a typical year's program. To this planting is added many selected F_1s from the previous year's crosses. Three-way crosses, and occasionally, four-way crosses, are favored over simple crosses between two pure-line parents. Simple (two-way) crosses are generally thought of as first stage steps but of course must be made in numbers in order to feed the three-way program. Certain simple crosses are kept in continuous supply. To illustrate, a reserve stock of hybrid seed from the cross of Rodney x Cherokee might be drawn upon yearly to inject grain quality into a three or four-way hybrid. In a typical year between 2-300 different hybrid combinations will be grown.

Early Generation Procedures

The F_1 F_1s from three and four-way crosses are generally field grown in spaced-plant arrangement under a plastic cage for protection against bird damage. Based on plant and pedigree observation, the grain from two or more plants from the same cross may sometimes be combined into one lot.

The F_2 The F_2 seed lots (produced on F_1 plants) are sown in rod rows with a hand push drill, as many rows as are needed to accommodate the seed. A blank row is left between lots. Handling of the plots during the summer depends somewhat on pedigree, appearance, anticipated value and so forth. Some mass rogueing of undesirables may be done or a great deal of care given to certain lots. The lots are grown under a planned epiphytotic of a particular stem rust race (alternating yearly with Race 8 or 7A) with consequent notes and attention. Some lots are discarded before harvest; all others are cut with a power Jari and threshed on the spot with a Vogel Thresher. Harvested seed is discriminately screened on a Clipper Office Cleaner.

The F_3 If available, up to 400 plus grams of seed from each F_3 lot (produced on F_2 rod rows) is measured for planting. A tractor-pulled 9-hold farm drill set at 10 pecks per acre is used. Approximately 10-foot cleanout gaps between plots and two-three foot lateral alleys are allowed.

The F_4 (and sometimes F_5) This is essentially a repeat of the F_3 procedure. The objective is simply to advance the populations two or three generations in an efficient, easily-handled manner preparatory to making head selections in the F_5 or F_6. We are currently standardizing this procedure, noting how much seed gives how much length of plot. The plot should be large enough to display the genetic range of material. Then, in the final early generation year when head selections are removed it should be somewhat larger. The size of the F_3 plot is frequently limited by the amount of seed available from F_2 production; beyond F_3 seed stocks are not limiting. We would like to see F3 and F_4 plots 20-50 feet in length and plots from which heads are to be removed (F_5 or F_6) perhaps 100 feet in length.

All F_3, F_4, and F_5 and/or F_6 plots are grown under stem rust epiphytotic conditions with races 8 and 7A alternating yearly. In addition a rod row sample of each lot is grown under crown rust epiphytotic conditions (naturally-occurring races) at Aurora, N. Y. to observe crown rust reaction. Lots segregating for significant crown rust resistance may be grown at Aurora rather than at Ithaca for selection. In any year entire lots are discarded for sufficient reason. Selection or rogueing activity is as necessary. Notes on all characteristics of interest are taken. Harvest of selected plots is in entirety (usually) with a binder and threshing is done concurrently on the spot with a Vogel Thresher. Seed is rigidly cleaned to provide a prime seed lot for the following year.

The F_5 or F_6: Head Row Selection. The rate of seeding is reduced from 10 pecks per acre to 6-8 pecks and the two outside and one center drills rendered inoperative during sowing. This provides twin three-row plots for selection of heads by walking around the outside of the plot, selecting from the easily reached three rows at a time.

Head Row Nursery. These rows are four or five feet in length and one foot apart. Selections are recorded on field plan prior to maturity and tags made for these rows. Selected rows are harvested with a hand sickle and hung in a curing shed for later threshing.

Yield and Performance Nurseries

Each of the selected head rows from a given year provides enough seed to mechanically sow one three-rod row plot. All of these oats which come into the rod row trials in the same year are thereafter known as a YEAR GROUP, for example, the 1962 head rows will provide seed for the 1963 GROUP. Thereafter, YEAR GROUPS stay together as a unit, always have the same check variety, the same number of years of testing, the same history, etc. This arrangement is basic to what follows. Of course, with the passing of each year a YEAR GROUP becomes smaller as attrition takes place and eventually disappears except for the occasional selected variety or retained parent stock.

The Cornell project utilizes four basic types of performance nurseries. These are:

1. The Holding Nursery
2. The Challenger Nursery
3. The Advanced, or Regional Nursery
4. The Observational or Drill-Plot Nursery

1. The Holding Nursery

This nursery of one replicate contains one three-rod row plot of every oat being grown in the project. Included are old and new varieties, breeding lines, all of the YEAR GROUPS from the oldest (which might be 1952 GROUP of only three entries) to the newest which would be the 1963 GROUP with perhaps 3,000 entries. Entries are subject to elimination at anytime for cause. "Cause" might be the dislike of the plant breeder which permits him to mark 1600 of the 1963 GROUP for non-harvest or it might be the latest summary on the 1958 GROUP (five years of data) which suggests a further discard. This nursery "holds" all material at the pleasure of the plant breeder. A one-row Check variety (Garry) is grown every tenth row; all selections from the same cross are kept together but their order is internally randomized each year within the confines of the cross.

2. The Challenger Nursery

This nursery of three-rod row plots will have 40 entries and six replicates in 1963. Four of the replicates will be grown at Ithaca and two under crown rust presence at Aurora, N. Y. Entries are oats which have caught the attention of the plant breeder. They are "challenging" established varieties and standards for top-rated spots. Entries are drawn out of the Holding Nursery "across-the-board" and may and do include old varieties, the newer varieties and, predominantly, many selections from any YEAR GROUP.

3. The Advanced or Regional Nursery

This nursery consists of single rod row plots grown in randomized block arrangements. In 1963 the nursery will have about 15 entries, 8 replicates and 10 locations. This is primarily a data-gathering process on top-rated varieties and selections.

4. The Observation or Drill-Plot Nursery

This observation nursery is designed to show agronomic characteristics as they would appear under farm conditions. The plot size is 15 feet long x 6 feet wide and is sown with a standard farm drill, thus having 9 grain rows with 8-inch spacing. Many notes but no yields are taken, although selected plots may be harvested for their seed.

Additionally many satellite nurseries are grown. These include many types of cooperative nurseries and special nurseries to accumulate information, for example, on the smut reaction of new lines.

Variety Release

A decision to release a variety usually follows several years of project testing, including two years regional (state) testing and at least one year's inclusion in a regional USDA nursery. The plant breeder prepares and submits a description and performance summary to the College Seed Committee, an advisory group cutting across the lines of several Cornell departments. If approved by the College Seed Committee it is presented to the Board of Directors of the New York State Foundation Seed Stocks Agency, Inc. Upon acceptance by this board, the plant breeder turns over the supply of Breeders Seed and the Manager of the Coop proceeds with the letting of contracts for future seed increases. Seed increase (Foundation and Registered) takes two-three years, culminating in the commercial sale of Certified Seed to the farmer.

The preparation of a lot of Breeders Seed is an exercise in seed handling of the highest order. A two-thirds acre increase of a short oat in 1962 illustrates the procedure. The field was examined from every angle and rogued perhaps 40 times during the season. All machinery for harvest was air cleaned. A binder was used. No bundle was allowed to touch the ground until three rounds had been cut into the field. Bundles were shocked on the field some distance in from the edges. After curing the crop was threshed on the field with a Vogel Thresher. A power line was run to the field and a thoroughly inspected grain cleaner moved to the field where the grain was cleaned, placed in new bags and transported directly to fireproof storage. The objective throughout was to by-pass conventional procedures through which mixtures might be introduced. The seed will now move directly from the bag to the clean drill next spring, in fact, for this one year, seed treatment may be dispensed with in order to eliminate one additional risk of introducing any seed mixture.

Personnel

Professors G. C. Kent and L. J. Tyler for the Department of Plant Pathology, provide professional advice, technical supervision and much helpful cooperation in many phases dealing with pathological matters and are especially involved in the breeding for stem rust, crown rust and loose smut resistance. N. F. Jensen of the Plant Breeding Department is leader of the project. G. H. Willis, Experimentalist, is full-time technical assistant on the project. Two graduate students fill cereal assistantships and there are usually about four Ph.D. and two M.S. candidates working on research in cereals. A department hourly labor force furnishes needed labor crews during the summer season. This is also the entire staff for the overall project which has the responsibility for wheat, winter barley and winter oat breeding.

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*** New Procedure for Registering Oat Varieties ***

by H. C. Murphy, USDA

The Board of Directors of the Crop Science Society of America, on August 22, 1962, adopted several modifications in the voluntary crop variety registration program. Consequently the following procedure will be used for the registration of oat varieties:

1. All oat varieties released by public or private agencies are eligible for registration provided they are proven distinct from other varieties and comparative data indicate worthy performance of the new variety in relation to standard or commonly grown varieties.

2. Oat varieties should be registered as quickly as they qualify, preferably concurrently with or very shortly after release.

3. Both public and private data may be considered in establishing variety eligibility for registration.

4. Published oat variety descriptions should include:
   (1) Characteristics which serve to identify the variety.
   (2) Characters of interest to the plant breeder.
   (3) Information on disease reaction.
   (4) Relative performance in economic traits.
   (5) Areas of intended usage.

5. Oat variety descriptions are published in Crop Science. Variety descriptions may be authored by the originator of the variety, but the oat subcommittee will be responsible for accuracy and adequacy of the description.

J. W. Neely, H. L. Shands, and H. C. Murphy (Chairman) are the current members of the subcommittee of the Committee on Varietal Standardization and Registration responsible for the registration of oat varieties.

In line with the above procedures, it is requested that oat variety descriptions be prepared and submitted to H. C. Murphy along with the applications for the registration. If this arrangement is followed, the registration articles can continue to be published in the numerical order of the registration numbers.

A list of registered oat varieties (Registration Nos. 1-170) was included in the 1960 Oat Newsletter. The following nine additional oat varieties have been registered since 1960:

Variety	Year Reg.	C.I. No.	Reg. No.
Bronco	1961	6571	171
Tonka	1961	7192	172
AB-110	1962	7148	173
Alamo-X	1962	7648	174
Blount	1962	7769	175
Oneida	1962	7458	176
Radar 1	1962	7339	177
Radar 2	1962	7340	178
Nodaway	1962	7272	179

There are many additional important oat varieties that should be registered. Keep in mind that the originator of the variety may author the registration article, and he does not have to be a member of CSSA or ASA. (See the November-December 1962 issue of Crop Science, pages 531-534, for recently published oat registration articles.) Application blanks for registration will be supplied upon request. How about "flooding" us with applications.

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*** An Early Gene from Wild Oats ***

by Coit A. Suneson

From a cross of a monosomic x *A. fatua* (see 1958 Newsletter) a gene has been recovered which induces flowering about 15 days earlier than in any plants in a Composite of the World Collection of oats. It is unique in two other respects -- its partial dominance, and yield superiority over equivalent early types in barley and wheat. Seed from 10 different F_1 from it has been put in Jensen's contributory gene pool. This should insure quick general distribution.

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*** Protein and Digestible Laboratory Nutrients in Oat Hay Irrigated with City Sewage Effluent ***

by A. D. Day, M. G. Vavich, and T. C. Tucker[1]

An experiment was conducted over a two-year period (1957 and 1958) at Cortaro, Arizona, to compare the protein percentage and digestible laboratory nutrient (D.L.N.) percentage in Palestine oat hay irrigated with sewage effluent with the protein and D.L.N. in oats irrigated with well irrigation water and fertilized with different amounts of commercial fertilizer. The soil was a Gila silt loam. The 10-year (1941-1950) mean precipitation for the area during the oat growing season (December through March) was 2.98 inches.

The data for the two-year average protein percentage and D.L.N. percentage in oat hay for the four irrigation and fertilizer treatments are given in Table 1. The protein content of the hay was 6.98% on the control plots and 9.74% on the plots that received sewage effluent. The D.L.N. percentage in the hay was 72.0% and 68.0% on the control plots and the plots that received sewage effluent, respectively. When oat hay was grown with sewage effluent, it contained less protein and D.L.N. than when it was irrigated with well water and fertilized with nitrogen, phosphate, and potash from commercial fertilizers in amounts equivalent to those supplied in sewage effluent.

The response of wheat to sewage effluent when grown for hay was similar to that obtained from oats. However, the average protein and D.L.N. percentages in barley hay grown with sewage effluent were higher than when barley was irrigated with well water and fertilized with nitrogen, phosphate, and potash from commercial fertilizers in amounts equivalent to those supplied in sewage effluent.

Table 1. The average protein percentage and digestible laboratory nutrient (D.L.N.) percentage in hay from Palestine oats grown with different irrigation and fertilizer treatments at Cortaro, Arizona, in 1957 and 1958.

Irrigation and fertilizer treatment	Two-year average percentage	
	Protein	D.L.N.
1. Well water with no additional fertilizer (control)	6.98	72.0
2. Well water with 100 lbs. N, 75 lbs. P_2O_5, and 0 lbs. K_2O	11.00	70.0
3. Well water with 200 lbs. N, 150 lbs. P_2O_5, and 100 lbs. K_2O	12.22	72.0
4. Sewage effluent with no additional fertilizer or water	9.74	68.0

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[1]Agronomist, Agricultural Biochemist, and Soil Scientist, Arizona Agricultural Experiment Station, University of Arizona, Tucson, Arizona, respectively.

*** Observations on Halo Blight in Virginia ***

by C. W. Roane and T. M. Starling

For the past three years, much killing of winter oats has been caused in Eastern Virginia by the halo blight bacterium, Pseudomonas coronofaciens. Oat varieties, which have survived well until early March, have been dying during the month of March. Apparently, this has been happening for many years, and when notes on winter survival are made in late March or early April, certain halo-blight-killed varieties have been written off as having been winter-killed. Actually how much killing can be attributed to the rigors of winter and how much to halo blight is impossible to say, but there does appear to be some relationship between late winter snow cover and killing by bacteria. The sequence of symptoms is described below. (See also, Plant Disease Reporter 44: 696. 1960)

In early March after the last of the snow cover has disappeared, certain oats have been observed to be normal green with little winter killing, stands being nearly 100%. Shortly thereafter, patches of oats begin to yellow and within two weeks turn brown and die. Since little or no spring growth has occurred at this time, winter killing would be an obvious explanation of what has happened. However, the halo blight bacterium can be readily isolated from the crowns of yellowed plants. By mid-April, most of the plant remains have been blown away and only a few fragments marking the original crowns are left.

All infections do not kill the plants. Large patches of yellowed plants have been observed in late March in fields of Arlington oats. Here the plants were severely stunted, the upper leaves had linear, lemon-yellow stripes, and basal leaves were either red or brown. Numerous atypical lesions of halo blight were present. The lesions were atypical in the following respects: They were linear and the centers were necrotic, but they frequently occurred on yellow or red, rather than green leaves. The midrib was frequently invaded and lesions progressed down the leaves to nodes and often into the crowns. A number of green, unaffected tillers were scattered throughout these areas, but from the appearance of these areas, it was expected that they too would die.

In mid-April following nearly two weeks of warm weather, plants in the yellowed areas had shown remarkable recovery. Although the plants were stunted and numerous tillers had died, new tillers had appeared and the scattered green tillers had elongated without further yellowing. These patches were no longer visible from a distance. Numerous typical halo blight lesions were now present, but there were some new atypical lesions present, also. Newly emerged leaves frequently had a small, stringy, dead tip bent off to one side. These tips were one or two inches long and were aptly called rat tails, although they were more like mouse tails. Yellow stripes, which faded into normal green, were observed just below these rat tails. This symptom was very striking for a week or so until the next leaves extended above them. Each succession of leaves had fewer lesions. Only scattered halo blight lesions appeared on the upper leaves.

No laboratory studies have accompanied these observations, but it seems certain that the bacterium causing the crown rot is extremely active at low temperatures and that its activity is triggered by late winter snow cover. As the temperature rises and growing conditions improve, bacterial activity decreases and symptoms abate.

Of the commercial varieties tested in Virginia, Dubois (C.I. 6572), Mid-south (C.I. 6977), and Victorgrain 48-93 (C.I. 7125) are resistant; Earlygrain, Fulgrain (C.I. 5336), and Woodgrain are intermediate; and Arlington (C.I. 4657), Atlantic (C.I. 4599), Bronco (C.I. 6571), Forkedeer (C.I. 3170), Fulwood (C.I. 6584), Lee (C.I. 2042), Moregrain (C.I. 7299), and Suregrain (C.I. 7155) are susceptible.

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*** Increase Your Oat Yields and Make Oats a High Profit Crop ***

by Dallas E. Western, Quaker Oats Company[1]

Yes, oats can be raised in Iowa at a profit in competition with other crops, especially when given equal consideration.

With normal Iowa weather and only average land, one can now produce at least 80 bushels and it is entirely possible to harvest over 100 bushels of oats to the acre. With current prices for both oats and soybeans, the net return from an 80-bushel oat crop will equal the net return from a 28-bushel soybean crop. In addition, we have the added value of the oat straw which is currently worth in excess of $20.00 per ton. Furthermore, by growing oats, we protect our soils from erosion and certainly there are many thousands of acres in Iowa that should never be planted continuously to a row crop.

Weather Only One Factor

The weather is only one factor in getting a big yield of any crop and oats are no exception. In Iowa, it is more important to get oats off to a satisfactory start than any other crop. During the first six weeks after emergence, oats do all of their stooling or tillering and at the same time the size of the panicle, or head, is formed in the base of each tiller. If, during this period, oats have not been planted in a satisfactory seed bed and do not have an abundance of available nutrients, especially nitrogen, then even the best of weather can't possibly form the number and size of heads necessary to make a 100-bushel oat crop.

Oats After Corn

It has long been the general practice in Iowa to plant oats following corn. Today, with hybrid corn and the high populations of plants, there is mighty little available nutrients left for an oat plant to pick up during its early life just when it needs it most. Furthermore, should there be any carry-over of nitrogen, it will most likely be "tied up" in attempting to decompose the heavy tonnage of stalks. This is a very sorry situation since the first thing that oats need in the spring is available nitrogen.

Even though these old practices still exist in the Corn Belt, it is possible to get the crop off to an excellent start and to obtain large yields.

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[1]Taken from a January 1963 release by the Quaker Oats Company for distribution in the Iowa area. This illustrates positive steps which can be taken to improve the oat situation. -Ed.

Nitrogen and Fall Field Preparation Essential

To get oats off to a fast start, and this is absolutely necessary, here are the recommended steps for getting big yields and making oats a profitable crop:

Step No. 1 -- When possible, it is highly desirable to make full preparation of the field for planting in the fall of the year. Our present heavy accumulation of stalks keep fields from drying quickly in the spring. It is a well-known fact that oats should be planted early. In the spring, many farmers get in their fields too soon with heavy tractors and big discs and by so doing not only pack the soil, but also slice it into big, wet hunks -- thus making for a very poor seed bed.

If the discing work is done in the fall, one will find the next spring that it has prevented erosion and also that the soil is loose and mellow, the same as if it were fall plowed.

Step No. 2 -- Most farmers today have a stalk chopper and use it before plowing for corn or soybeans. This is recommended before oats, too -- and should be the very first operation.

Step No. 3 -- Unless growers have a fertilizer attachment on their grain drill, the fertilizer should be applied before discing regardless of whether the field preparation is being done in the fall or the spring. Fertilizer is a must. On the average, 40 pounds of nitrogen (120 pounds ammonium nitrate) per acre is recommended. Unless soil tests show otherwise, use 20 pounds of phosphate (100 pounds of 0-20-0) per acre.

Step No. 4 -- The field is now ready to be disced. If the stalks have been chopped, once over with a tandem disc is usually enough. If the stalks have not been chopped, a double discing will be necessary.

Step No. 5 -- The field is now ready for planting regardless of whether the work was done in the fall or spring. Oats should, by all means, be planted with a grain drill. If a grain drill with a fertilizer attachment is used, the fertilizer can be economically applied at the same time as seeding the oats. Seed the oats at the rate of at least three bushels per acre. If an old-fashioned end-gate seeder is used, plant at the rate of at least three and one-half bushels per acre.

Step No. 6 -- If oats are planted with a grain drill, the field needs to be only dragged once with a harrow. Sometimes it is only necessary to drag the field once after the end-gate seeder, but usually twice is better.

Oats Need No Further Attention After Planting

When oats in Iowa are well fertilized with nitrogen, they usually get off to such a fast start and tiller so well that weeds never become a problem. Therefore oats, unlike all other crops grown in Iowa, need no further costly attention until harvest time. It costs at least $8.00 an acre less to produce oats than it does a crop where plowing, cultivation, and protective chemicals are necessary.

Selection and Preparation of Seed

Today, farmers plant expensive seed corn and beans all of which have been treated so why do less for oats? Seed oats should not only be cleaned and treated, but tested for germination the same as any other seed grains.

Desirable Varieties for Iowa -- There are many excellent disease-resistant oat varieties adapted to Iowa, most of which will stand heavy fertilization. Some of these are:

Goodfield	Goldfield	Tonka	Recommended north of U.S. 30
Clintland 60	Putnam 61	Minhafer	Jewell
Newton	Goldcrest	Bonkee	Dodge
Burnett	Nodoway		

Yields Can Be Doubled

If farmers will follow these recommended steps, particularly the fall preparation of fields and a fertilization program, they can in most cases get yields which are double or even triple those which are now being obtained. We can now grow oats as a profit crop rather than as a "little old nurse crop" not only on rolling fields subject to erosion, but on our better land as well. On the average, any field that has been prepared and fertilized to produce 100 bushels of corn will, under proper care, produce 125 bushels of oats and at least a ton of straw.

Costs Are Less

The cost of the fertilizer for the oats will be in the neighborhood of one-fourth that of corn. The field operation costs will be at least $8.00 per acre less than corn. Then, too, oats don't need to be shelled and dried before delivery to the market place. The planting and harvesting of oats does not interfere with other farm operations.

Remember, where oats are given proper consideration, they will compete profit-wise with other crops grown in Iowa.

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*** Guidelines for Distinguishing Crop Variety Names in Manuscripts ***

by H. C. Murphy

Inconsistencies have been noted on the part of authors, reviewers, and editors as to the method of distinguishing variety names in manuscripts. The International Code of Nomenclature for Cultivated Plants, 1961, states (Art. 17):

> "A variety name, when immediately following or preceding a botanical or common name, must be distinguished clearly from the latter, either by placing the abbreviation cv. before the variety name, or, for example, by enclosing within single quotation marks."

Clearly the intent is to differentiate variety names from botanical (Latin) or common (sometimes called kind) names. In Art. 10 of the Code, authors are cautioned to avoid confusion between the terms "variety" and "varieties" (a botanical category between species and forma) by suitable differentiation. Botanical varieties are distinguished in manuscripts by preceding the name (Latin) with the abbreviation var. Therefore, it is incorrect to use this abbreviation for cultivated varieties: e.g., Avena sativa L. var. Clinton (cv. Clinton would be correct).

The manner of differentiation is not specified; only double quotation marks are forbidden. Use of cv. (an abbreviation of cultivar which, in turn, is an abbreviation of cultivated variety) and of single quotation marks is cited as examples. Other means, such as all small capital letters (double underlining), would be permissible. In papers written for professional journals, the materials worked with might appear as Avena sativa L. 'Garland' and 'Garry,' Horedeum vulgare L. 'Kindred' and 'Trebi,' etc., or listed as Garland and Garry oats and Kindred and Trebi barley.

The frequency of distinguishing variety names is specified by the Code as necessary only when the variety name immediately follows or precedes the botanical or common name. Some type of distinction of variety names should be used at the first mention. In further reference to the varieties mentioned, except where confusion with botanical names seems probable, no distinction need be made in the majority of manuscripts. Distinction at only the first mention in a manuscript is in accord with the practice generally followed in giving the authority for a botanical name only where it is first listed. Such practice is in compliance with the intent of the Code for crop variety names.

Editorial practices in journals vary greatly. Policies of specific periodicals should not be confused with requirements of the Code.

It is recommended that oat workers conform to provisions of the Code at first mention of a variety (cultivar) name and wherever else confusion with botanical names seems probable. Specific editorial practices should be left to the discretion of journal editors after the papers have been accepted for publication.

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*** A Suggestion for Breeding Heat Tolerant Spring Oats ***

by E. J. Kinbacher and N. F. Jensen

Eight varieties of winter oats (Nysel, Mallard Sel., Wintok, Norline, Dubois, Pentagon, LeConte and Winter Turf) were subjected to 112° for 8 hours at 50, 75, and 100% relative humidity. Nysel and Norline were significantly the most heat resistant varieties at the 3 relative humidities employed. These varieties were resistant to true heat injury (saturated atmosphere) as well as combination of heat and drought injury. Nysel and Norline apparently have an effective transpiration system as well as inherent heat resistance. If used in

a spring oat breeding program, as heat resistance parents, Nysel and Norline should add factors for heat resistance to the progeny. They would also broaden the genetic base of spring oat varieties.

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*** World Collection of Oats ***

by J. C. Craddock, USDA
Beltsville, Maryland

During 1962 the World Collection of Oats received 329 additional sources of germ plasm. Plant introduction (PI) numbers were assigned to 82 entries received from foreign countries. Domestic plant breeders submitted 147 entries for Cereal Investigation (CI) numbers. Seed stocks of the new additions will be made available for distribution as soon as possible.

A report entitled "Abbreviation of Oat Varietal Names" (CR-85-62) has been completed and a copy is being distributed to all oat investigators. If you have not received your copy, kindly inform me.

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*** A New Cereal Leaf Beetle in United States ***

by R. G. Dahms, Chief, Grain and Forage Insects, ARS

A leaf feeding beetle (Oulema melanopa), new to this country, caused serious damage to oats in Berrien County, Mighigan, in 1962 and is known to occur also in Cass County, Michigan, and St. Joseph and LaPorte Counties, Indiana.

This insect has done serious damage in Europe for many years. Both adults and larvae attacks leaves of all cereals and many grasses. Its favorite cultivated hosts appear to be oats, barley, wheat and corn.

The insect is known to have been in Michigan since 1959 but was not identified as a newly established pest until July 1962. Although the known area of infestation is about 30 miles square, it is likely that the infested area has not been definitely delineated. Adults can live several weeks without food. They could thus be transported by vehicles and farm machinery or on farm products such as hay or grain. They are also strong fliers.

Plant Quarantine Officials in Michigan and Indiana have placed in effect State Quarantines to prevent dissemination of the beetle from known infested areas.

Michigan Agricultural Experiment Station has initiated research on the biology and control of the insect, and the Entomology Research Division of the Agricultural Research Service will cooperate in these studies. Also, through its Laboratory at Paris, France, the Entomology Research Division has initiated a search for parasites of the insect in Europe.

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*** Puerto Rico Oat Rust Nurseries, 1962-63 ***

by H. C. Murphy and Marie Prechtl, USDA

The locations, number of entries, and races of rust for each of the Puerto Rico oat rust nurseries being grown in 1962-63 are as follows:

Location	Race	No. of entries	Rust
Isabela	264	3,719	Crown
Ponce	290	3,552	Crown
Mayaguez	6A&13A	1,398	Stem
Lajas	6A biotypes	411	Stem

Virulent race 264 and the "290 group" of races of crown rust continue to represent a serious threat to the U.S. oat crop. Race 6 has become the most prevalent race of crown rust. Subrace 6A and related 13A represent serious threats because of the susceptibility of the ABCD genotypes. Even more dangerous are new, relatively rare, but extremely virulent biotypes of 6A recently collected in the barberry areas of eastern Canada and northeastern United States. Plans for the "biotypes of 6A" nursery at Lajas were formulated late in the season. It includes a limited number of entries offering some promise of at least field resistance. Any resistance found in either the 6A-13A or the 6A-biotypes nursery should be extremely valuable.

M. D. Simons supplied the inoculum of crown rust races 264 and 290 for inoculating the 1962-63 Puerto Rico nurseries. B. J. Roberts and G. J. Green supplied the inoculum of stem rust subraces 6A and 13A and biotypes of 6A for the 1962-63 nurseries at Mayaguez and Lajas. Supplying adequate, viable and pure inoculum is vital to the success of the Puerto Rico oat rust nursery program.

Facilities for testing parental and early generation lines of oats with dangerous races of rust have been made available by the Federal Experiment Station, Crops Research Division, ARS, USDA, Mayaguez, Puerto Rico, and by Agricultural Experiment Substations of the University of Puerto Rico at Isabela, Lajas, and Fortuna, near Ponce. Donald V. McVey, pathologist, and Felix A. Jimenez, agricultural aid, Federal Experiment Station, Mayaguez, are responsible for the Puerto Rico phases of the program. The over-all wheat and oat rust testing program in Puerto Rico is coordinated by Louis P. Reitz, Crops Research Division, Beltsville, Maryland. The oat nurseries are coordinated by H. C. Murphy. All seed is assembled and data summarized and distributed by Marie Prechtl and J. C. Craddock at Beltsville.

The number of United States and Canadian cooperators submitting entries, states or provinces participating, and rows of oats grown in each nursery, for the past six seasons, has been as follows:

	1957-58	1958-9	1959-60	1960-61	1961-62	1962-63
Cooperators participating	17	18	25	24	21	17
States and provinces represented	13	12	16	15	18	14
Approximate number of rows						
Crown rust race 216	--	600	--	--	--	--
Crown rust race 264	4,800	4,800	5,700	5,002	4,774	3,719
Crown rust race 290	--	1,200	5,000	--	--	3,552
Crown rust race 294	--	--	--	4,899	--	--
Crown rust race 321	--	--	--	--	2,964	--
Stem rust race 6A	--	--	--	--	2,238	--
Stem rust race 13A	--	540	1,900	547	--	--
Stem rust races 6A, 13A	--	--	--	--	--	1,398
Stem rust biotypes of 6A	--	--	--	--	--	411
Total	4,800	7,140	12,600	10,448	9,976	9,080

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*** Oat Smut ***

by C. S. Holton, Pathologist
Regional Cereal Disease Research Laboratory
Pullman, Washington

The development of a standard group of homozygous pathogenic races ranging from the narrowest to the widest ranges in pathogenicity patterns is now the basic objective of the race study. Among the various standard races and genetic lines used in this study, collection 588 had the narrowest range of pathogenicity and the synthetic line A-6a (227-1 x 2) had the widest range. Homozygosity for pathogenicity apparently has been established in several of the races of U. avenae while displays of erratic pathogenic patterns from one year to the next are characteristic of certain other races and genetic lines.

Two varieties out of 15 were smut-free in a test against 6 key races of Ustilago avenae and 4 others were highly resistant to these races. Differential reactions were displayed by 9 varieties, the interactions between host and pathogen in some cases reflecting the host pedigree.

Further evidence was obtained that postulated genotypes based on pathogenic patterns expressed in the F_2 are not always substantiated by F_3 performance of pedigreed lines of loose smut. This suggests the interaction of minor or complementary virulence genes in the display of specific pathogenic patterns in Ustilago avenae.

A second successful step seems to have been made in bringing all known virulence genes of U. avenae together in one genetic line. The Camas virulence of A-7 appears to have been added to A-6a, bringing the total range of virulence in the latter line to 7 of the tester varieties.

For the second year dominance of virulence was expressed in certain race hybrid combinations, thus confirming that avirulence is not always dominant. Whether virulence or avirulence is dominant apparently depends on which races and variety reactions are involved.

Inbreeding for 3 generations has produced no apparent effect on the range and degree of virulence in race 5 of Ustilago avenae.

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*** First Year Report on the World Oat Gene Bank ***

by N. F. Jensen, Dept. Plant Breeding, Cornell University, Ithaca, N.Y.

The hybrid oat gene bank got underway in 1962 with the receipt of four seed lots totaling 1430 grams. Contributors were:

C. A. Suneson, California, received 1961, 48 grams
C. A. Suneson, California, received June 1962, 328 grams
P. G. Rothman and D. H. Bowman, Mississippi, July 1962, 1025 grams
N. F. Jensen, New York, received 1962, 29 grams

The oat bank did not get underway with as good a response as the wheat and barley banks with 12 contributors and 25 pounds, and 3 contributors and 33 pounds, respectively. One might expect this in view of the difficulties inherent in the successful hybridization of oats. We can accept a relatively slower growth of the oat bank or perhaps at some future date the restrictions might be modified to invite the submission of small samples from F3 or F4.

It is becoming clearer, from the expressions of others concerned with the bank's operations, what the probable method of distribution might be. When a stock of sufficiently broad germplasm base has accumulated, an amount, perhaps 2 pounds, might be withdrawn and increased under quarantine conditions at perhaps two locations which favor the maturity of all kinds of oats included in the composite. With a 30-fold increase there would be on hand about 60 pounds of F3 seed. A portion of this would be preserved and the rest distributed to cooperators on demand, perhaps in one or two-pound lots. New increases would be made as needed and, of course, each new increase would be made from bank stock expanded by new accumulations.

It will be helpful in sending in F2 seed (produced on F_1 plant) if separate composites are made for spring x spring, spring x winter, and winter x winter hybrids. Outside U.S. boundaries shipments should be made to Dr. J. C. Craddock, World Collection of Small Grains, USDA Plant Industry Station, Beltsville, Md.

Reprints of articles on the gene bank may be obtained by writing Jensen.

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*** Protecting Oat Plots from Bird Damage ***

by H. R. Klinck, Macdonald College, Quebec

Over the years, considerable damage has been done to oat breeding and test plots by sparrows feeding on the succulent developing grain in the early dough stage. Covering large areas with bird-proof netting, erecting electrical systems around the periphery of the plot area, and other systems of control, while effective, are nevertheless expensive. A relatively simple and inexpensive system was used at Macdonald College during the summer of 1962 with considerable success.

Flocks of sparrows prefer to feed on plots situated along open spaces such as wide roadways or non-cropped areas. Seeding a drill-width section adjacent to such spaces with a mixture of wheat, oat and barley varieties having a wide range of maturity provides material for them to feed on, and there is less tendency for them to attack the valuable material toward the centre of the plot areas. This has been quite effective in reducing damage, but is not sufficient for complete protection. The second stage of protection involves the use of fine black threads.

Soon after the plants reached the heading stage, five-foot stakes were set at about 50 foot intervals along the pathways between sections of plots. Several lines of No. 10 cotton black thread were strung from stake to stake at vertical intervals of four to six inches, from the level of the bottom of the lower heads to about one foot above the tops of the plants. The pathways were left clear in order to permit access to the plots for note-taking and selection.

The threads did not prevent occasional feeding by individual birds, which do little damage in any case, but were very effective in warding off the large flocks which are prevalent at that time of year. Part of this effectiveness appeared to result from distress calls created by the odd bird that got caught up in the threads.

The only areas damaged were the outer sections seeded specifically for bird feeding, and sections in other fields where no threads were strung. In some of these areas losses were close to 100 per cent.

This system of providing a feeding area and protecting valuable plots with threads has considerable merit. The materials are inexpensive, readily constructed, and effective. It is planned to extend the system in 1963 to protect all of the oat plot areas at Macdonald College.

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IV. CONTRIBUTIONS FROM OTHER COUNTRIES

*** CANADA ***

*** Cereal Crops Division, Ottawa ***

by F. J. Zillinsky, R. V. Clark and P. Dyck

The 1962 season was not conducive to reliable testing in Ontario and western Quebec. Hot dry weather prevailed from seeding time until early July then turned cool and wet until harvest time. Second growth, particularly on the early varieties made harvesting difficult and lowered the quality of the seed. The weather delayed the development of diseases until the latter part of the growing season. Septoria was quite prevalent by late July. Stem rust was dispersed from southern Ontario to the Maritimes but was of little consequence except on late sown oat crops and in barberry infested areas.

Russell has become a popular variety among growers in Ontario. Its performance in Regional and Co-operative Tests justifies its acceptance. Strain QO.3-1 from cross Ajax x Shefford entered in Co-operative Tests by the Quebec Project Group has yielded particularly well in Quebec and the Maritimes during the past three years.

Barberry and the Stem Rust Problem

Recent observations from disease surveys and uniform rust nurseries in Ontario and Quebec indicate that common barberry may be responsible for most of the oat stem rust problems in Eastern Canada and perhaps other areas of North America. Areas infested with barberry are predisposed to stem rust infection with great regularity. In these areas the oat crops are infected earlier, damaged more severely and serve to increase inoculum which spreads to neighboring crops. In rust surveys made in eastern Ontario with Dr. Gordon Green in 1961, it was observed that barberry was present in all areas where stem rust occurred early in the season. Later, the rust had spread throughout most of eastern Ontario and southern Quebec. Practically all of the new races of oat stem rust have been isolated from, or could be found in, areas where barberry occurs. Not only does barberry provide the mechanism for creating new races but ensures the perpetuation of these races from season to season, so that inoculum from these areas may eventually enter the main rust belt of the Mid-West.

Some rather disturbing features to plant breeders are the frequency with which new races have recently been isolated, the rate at which they have built up and spread across the country and their wide range in pathogenicity. Stem rust occurring in a rust observation nursery located in a barberry infested area of eastern Ontario in 1962 was capable of parasiting all of the rust resistance genotypes available to date in common oats.

A proposal to initiate a country wide campaign to eradicate all barberry was favorably received by the Ontario provincial authorities and co-operation

is being solicited from the Federal authorities as well. Barberry eradication campaigns following World War I were successful in removing most of the barberry, particularly in Western Canada but isolated pockets remained in the East. The shrub has continued to increase and spread from these areas in spite of the limited efforts to keep it under control. If the proposals now under consideration are undertaken seriously, barberry is in for a rough time. If the barberry isn't checked the plant breeders are in for a rough time.

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*** Department of Agriculture Research Station ***
Winnipeg, Manitoba

by R. I. H. McKenzie, G. J. Green and G. Fleischmann

The 1962 growing season was very favorable for oat production in the three Prairie Provinces. A yield of 45 bushels per acre resulted in a crop of 322 million bushels which was almost double the 1961 crop.

Rodney is now grown on about 80 percent of the acreage in Manitoba, 50 per cent in Saskatchewan and 35 percent in Alberta. Garry is grown on most of the remaining acreage in Manitoba and Saskatchewan while in Alberta Victory and Eagle are also widely grown. The very large and plump kernel of Rodney is apparently the reason that it is so widely grown in Western Canada.

The distribution of races of oat stem rust in Western Canada changed markedly in 1962. A new kind of race 6 predominated that had not been found previously in Canada except for a few isolates in 1961 when rust was scarce. The new race was found mostly on susceptible wild oats but when the first cultures were encountered in the greenhouse concern was felt because infection types 1 to 4 were produced on the varieties Rodney and Garry. Many single pustule isolates from type 1 to type 4 infections also produced type 1 to type 4 infections on these varieties. Their reaction to this race is considered to be mesothetic although they are more resistant at low temperatures and the infections lack much of the chlorosis usually associated with a mesothetic reaction. The new race was found rarely on Rodney and Garry in the field, indicating that they are resistant in the adult plant stage. This conclusion was confirmed in adult plant trials in the greenhouse.

Commercial oat fields in southeastern Manitoba were attacked by crown rust in 1962. Fortunately, however, the rust did not develop until after most of the crop had headed and a serious loss did not occur.

Almost all the crown rust isolates identified in 1962 from Eastern and Western Canada were virulent on the predominant commercial varieties Garry and Rodney. Isolates attacking Bond and Victoria comprised the bulk of the crown rust population in the west. Races virulent on Landhafer and Santa Fe (294 and 295), previously identified only from the east were also found this year in Western Canada. The racial situation within the rust population in Eastern Canada showed little change from previous years.

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*** Department of Plant Science, University of Manitoba, Winnipeg ***

by R. C. McGinnis

Aneuploid Studies

By checking chromosome numbers in root-tips of seedlings of Garry, a number of spontaneous aneuploids have been found. Thus far at least 6 and probably 8 or 9 different monosomics have been isolated by karyotype studies. In addition, 5 different trisomics have been found. Unfortunately the seed increase block, planted in the field, was hailed out so there are only meager seed stocks for most aneuploids.

Because spontaneous aneuploids occur in such a low frequency, different methods of artificially inducing them are being studied. The treatments under investigation include different doses of X-irradiation, mutagenic chemicals, sonic vibrations and temperature shocks. The most effective method will be adopted in an attempt to develop the complete aneuploid series in Garry. Thus far a dose of 300 r of X-irradiation applied to young panicles has been found to markedly increase the aneuploid frequency. In a population of 260 seedlings resulting from irradiated panicles, about 16% were aneuploids. These aneuploids are being studied to determine the number of different chromosomes involved.

A study is also underway to determine the effect of temperature, light intensity and day-length on the transmission rate of the univalent in monosomic 14. Two unrelated sources of this monosomic are being studied under these conditions to reveal the genotypic as well as the environmental influence on univalent behaviour.

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*** INDIA ***

*** Crown Rust in India ***

by B. L. Chona, I.A.R.I., New Delhi

Research initiated on the Crown Rust Complex (Puccinia coronata Cda. sensu lato) has demonstrated the occurrence of two varieties: P. coronata avenae and P.c. himalensis, while the existence of P.c. agrostis seems probable. Two types of aecia occur on species of Rhamnus in the Himalayas. Those containing small-sized aeciospores belong to P.c. himalensis which in its uredial and telial stages is restricted to Brachypodium sylvaticum. The aecia containing large-sized aeciospores might belong to form or forms present on grasses like Helctotrichon virens and Agrostis spp.

The crown rust on cultivated oats (a variety of Avena sativa) has been found at Kalimpong in West Bengal. Two physiological races resembling the International Races 231 and 240 (identified by reactions on a set of 10 differential cultivars recommended by Simons and Murphy, 1955) have been found. Varieties of Avena sativa like Hyb. X-27, N.P.1, N.P.3, Hyb-1, Hyb-3, Richland, Minrus, Joanette and Victory proved to be susceptible to races 231 and 240 in mixture. In the crossing programme, endeavour should be made for utilizing resistance available in varieties of Avena byzantina. It is noteworthy that most of the indigenous cultivated oats of India belong to Avena byzantina.

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*** JAPAN ***

*** Hokkaido National Agricultural Experiment Station ***

by Takeshi Kumagai and Seiji Tabata

The product of approximately 98 percent of Hokkaido oat acreage is utilized as grain. The oat acreage of 1962 was as follows:

	Grain (ha.)	Forage (ha.)
Japan	84,500	21,100
Hokkaido	75,560	2,120

The acreage for grain is almost equal to the record of 1961, but the acreage for forage shows an increase. In general the weather conditions in 1962 were unfavorable for oat growing. In May and July there was very scanty rainfall, so that oat growth was severely checked, while on the third and fifth of August there was a heavy rainfall reaching to 238.5 mm. (9.4 inch), resulting in excessive lodging throughout Hokkaido. Early in June many stunted plants were observed especially in the nurseries sown on a kernel basis. It was confirmed that the condition was produced by northern cereal mosaic virus, whose vector was Delphacodes striatellus Fall., according to Dr. Fukushi, Hokkaido University, 1944. The writers, therefore, must make corrections in the descriptions of the 1961 Newsletter, in which barley yellow drarf virus was stated to be the major cause of the disease. Oats got damaged seriously by oat mosaic virus especially in Tokachi province, the eastern part of Hokkaido, and in Ishikari and Iburi provinces, the central part of Hokkaido. In these areas oats suffered considerable decline in yield. On the other hand, it was also found, on inspection, that considerable crown rust infection existed especially in the mountainous region of Tokachi province at the middle of June, a week after heading.

In breeding better grain varieties for Hokkaido greater emphasis is being placed on the combination of high yield and high standing ability, along with earliness and high groat percentage. Foreign varieties, such as Milford, S.172 and S.84 are the major sources of germ plasm for the purposes. New strains irradiated by x-ray for high straw strength were tested for lodging resistance

in field. However, they could not be rated properly because of excessive lodging caused by the heavy rainfall early in August, 1962. Eighteen of those selections were carefully harvested for the coming year.

In the fall of 1962, plantings were made of 64 entries in order to select winter hardy oats. It was found in the following spring that 43 varieties contained surviving plants if any difference, which grew slowly in the spring and came to maturity at the middle or the end of July. Killing ranged from a low of 5 percent for Virginia Grey to a high of 100 percent for 19 varieties. It was very rare that any large number of surviving plants were produced in the station.

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*** NEW ZEALAND ***

*** Oat Breeding in New Zealand ***

G. M. Wright, Crop Research Division, D.S.I.R.

The area of oats harvested in New Zealand has varied in the past ten seasons from 21,000 to 56,000 acres, but has not been below 30,000 or above 40,000 acres since 1957. In 1962 the area was estimated to be 32,000 acres, with an average yield of 53 bushels per acre. Two-thirds of this area was white oats, and 80% of this was sown to the English variety, Gartons Onward. An average yield of 63 bushels per acre was obtained from the Onward crops.

Oat breeding is the part-time responsibility of one cereal breeder. In the 1962-63 season there are at the Crop Research Division 473 plots of early-generation material for selection, and 50 hybrid lines and 4 introduced varieties are in replicated yield trials. The oats make up 7% of the total cereal plots. Some general-purpose oats are under test, but the main objective of the work is to produce improved varieties of milling oats. In the 1962 crossing programme the varieties Curt, Newton, and Niagara were used for the first time. Introduced varieties which show any promise on their own merits are grown in observation plots in the oat-growing districts before inclusion in yield trials.

New Zealand millers prefer an oat with a plump secondary grain to one with a low husk content, as farmers are not prepared to dress out small grains during harvesting, and although there has been no difficulty in obtaining hybrids with improved yields and resistance to lodging, particularly from crosses between English and Welsh varieties, few of the advanced lines have approached the milling quality of Onward. In the last few years, however, in selecting for milling quality more attention has been given to grain size and less to husk percentage, and two lines have given satisfactory results in recent full-scale milling trials. One of these is a crown-rust resistant Onward: Onward^{5} X Garry, derived from the original Garry variety. It resembles Onward in field performance (including susceptibility to lodging) and kernel characteristics, but has a slightly thinner husk. The other line, 72.01, which has shown greatly improved yield and agronomic

characters, and reasonable milling quality, is from the cross Gartons Forward X Milford. One or both of these lines may be released this year.

Both crown rust and stem rust do some damage in New Zealand, but the most important disease is BYD virus. Dr. Harvey Smith since his return from Canada has continued several of the virus investigations reported to the Gainesville Conference (1961 Oat Newsletter, p. 18). The Australian variety Avon has been used as a resistant parent, and we have been pleased to find some single-plant progenies with good tolerance to BYDV in the field testing and purification of the hybrid 72.01.

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*** BYDV Resistance of Winter Oats in Canada ***

Harvey C. Smith, Plant Diseases Division, D.S.I.R.
Lincoln, N.Z.

Glasshouse Trials at Plant Research Institute, Ottawa, Canada

	Grain Yield/2 pots, grams			Approx. % Yield from	
	V58	MGV	Check	V58	
1 Dubois x NYSEL ILL. 20015	10.6	9.1	13.4	80	
2 Wintok x CIRN ILL. 20051	11.0	13.5	10.3	70-90	Moderately resistant
3*Dubois CI 6572	7.2	14.9	7.6	50-90	
4 Lee CI 2042	7.6	10.7	10.1	70	
5 Norline CI 6903	10.4	18.3	17.0	60	
6 Dubois x NYSEL ILL. 20096	8.5	11.5	14.3	60	
7*NYSEL CI 5364	9.7	23.1	19.7	50	Partial BYDV resistance
8 Dubois x Wintok ILL. 20150	5.0	7.1	10.0	50	
9*Wintok CI 3424	4.7	9.8	8.4	50	
10 Forkedeer CI 3170	3.4	9.5	5.0	30-60	
11 LeConte CI 5107	3.6	10.7	6.3	30-50	
12 Dubois x TEXSEL. ILL. 20069	3.4	10.9	6.5	30-50	
13 Dubois x TEXSEL. ILL. 20133	5.3	8.0	14.2	40	
14 Bronco CI 6571	5.1	14.0	11.6	30-40	BYDV susceptible
15 Ballard CI 6980	6.6	18.7	22.0	30	
16 Clintland 60	1.1	5.0	5.0	25	
17*TEXSEL 3770-1 x Coy	3.6	16.6	21.3	20	
18 Coy x Cl x H. Culb. 20092	4.3	16.5	32.4	16	
19 Exeter	0.3	1.9	1.8	15	

BYDV Inoculum used 'V58' = PADI isolate with R. padi.
V34 = 'MGV', specific isolate with M. avenae
Inoculated 2/3/62
Recorded and harvested grain July 1962.

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V. CONTRIBUTIONS FROM THE UNITED STATES: USDA AND STATES

*** FLORIDA ***

by Dale Sechler and W. H. Chapman (Quincy)

Oats continue to be grown primarily for grazing in Florida. The acreage was down, however, in 1961-62 since the driest fall on record delayed seeding until late November or early December. Oats made very little growth before the advent of cool weather. Rye is replacing a sizable portion of the acreage formerly seeded to oats for grazing.

Crown rust was rampant in 1962 causing the most extensive damage observed in recent years. Some susceptible type pustules were found on all commercial varieties. The resistance of Florad, however, held up well with only occasional pustules observed. Suregrain, the most widely grown variety in Florida, was rusted in the nursery but damage was not serious in commercial plantings. Landhafer derivitives, also widely grown in the state, were severely damaged. Races 216, 264, 276 and 295 were identified from samples taken across North Florida and submitted to Dr. M. D. Simons for identification. Race 276 predominated in all areas and appeared to do most of the damage.

Disease symptoms typical of soil-borne mosaic virus were observed rather widely in the Quincy nursery for the first time in 1962. Florad, Radar 1 and Radar 2 were the most severely affected.

Helminthosporium diseases were prevalent during the 1961-62 season as well as a number of other problems but damage was masked by the crown rust epidemic.

Conditions were favorable for the early seeding of oats in the fall of 1962 and early growth was normal. However, the coldest weather of the century (8°F. on December 12), following by only one week the first temperatures of the season below freezing, severely damaged oat varieties with a spring growth habit. Fields which were overgrazed were killed in some instances. All diploid varieties were killed. Some killing and severe leaf burn occurred in most hexaploid varieties regardless of inherent hardiness.

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*** GEORGIA ***

by D. D. Morey (Tifton)

There has been an increase in planting of small grains for forage and dual purpose use in South Georgia. Reasons for this are: (1) a smaller corn crop than usual and (2) better planting conditions this fall (1962). Small grains look very promising as of early December, 1962.

The Extension Division and Crop Improvement Association in Georgia are conducting an extensive drill-box survey in 54 counties this season. Small grains have been sampled and germination, purity and other tests by the State Seed Laboratory are under way. Samples from each drill-box will also be grown out at the nearest Experiment Station farm. Such a survey should be beneficial to Agronomists, the Crop Improvement Association, Seed Companies and farmers in Georgia.

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*** IDAHO ***

by Harland Stevens, Frank C. Petr and Ralph M. Hayes

The above average moisture during the early part of the growing season coupled with moderately cool weather as the season progressed was favorable for the production of oats in Idaho. Incidence of red leaf caused by the yellow dwarf virus was low as compared to the three previous years. No stem rust was reported in commercial fields, however, a late natural infection of race 8 of stem rust occurred on some late planted selections at Aberdeen.

The breeding work on oats at Aberdeen continues to emphasize yield, straw strength and quality - high groat percentage, protein, kernel weight and test weight coupled with white lemma color. Breeding work for red leaf is being started using the most promising sources of resistance to strains of the virus found in the Pacific Northwest. Smut resistance to the key races is being incorporated into potential selections when feasible. A moderate degree of stem rust resistance is also considered desirable. Less emphasis is placed on crown rust and victoria blight resistance as these diseases are not known to occur in this area from natural infection.

The varieties currently recommended for Idaho are Overland and Park for irrigated and relatively humid nonirrigated areas. Marida is generally recommended for nonirrigated areas. Oats are not usually grown in the more arid dryland areas of the state as the returns are considerably lower than can be realized from 2-row barley or bread wheat production.

Yields in the Uniform Northwestern States irrigated nursery ranged from 142 to 104 bushels per acre, test weights from 39.6 to 36.5 pounds per bushel; and lodging from 1.5 to 35.8 percent. Yields in the non-irrigated nursery ranged from 85.8 to 59.1 bushels per acre, test weights from 34.9 to 30.8 pounds per bushel, and lodging from 2.9 to 69.9 percent.

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*** ILLINOIS ***

by C. M. Brown, H. Jedlinski, and G. H. Boewe (Urbana)

Oats produced a state average yield of 51 bushels an acre in 1962. This is 3 bushels below the 1961 average but is approximately 9 bushels above the 1951-60 ten year average. Cool weather in June and early July provided excellent conditions for grain filling and corresponding high test weight. The acreage of oats harvested in Illinois continued its decline in 1962 but the rate of decline has decreased somewhat in recent years. Most of the Illinois oat production is now centered in the livestock areas of northern Illinois. Production in the future should be more stable since in that area the oat crop is in higher demand for use as a nurse crop and for its straw. The acreage and yield per acre for the past several years are as follows:

	Acreage Harvested (000) A	Yield Bu/A
1951-60 average	2,833	44
1955	3,195	56
1956	3,041	46
1957	2,751	38
1958	2,724	55
1959	2,233	40
1960	1,898	51
1961	1,634	56
1962	1,520	53

The five leading varieties in acreage were Newton, Clintland, Nemaha, and Goodfield. The percentage acreage of several varieties in Illinois during the past 5 years is as follows:

Variety	Percent of Total Acreage Planted				
	1958	1959	1960	1961	1962
Beedee	--	--	--	--	1
Bonham	2	3	3	3	2
Clintland	36	45	25	18	12
Clintland 60	--	--	--	3	6
Clinton	7	4	3	2	3
Goodfield	--	--	--	4	10
Minhafer	1	3	9	9	5
Nemaha	24	15	12	10	11
Newton	16	19	39	42	41
Shield	--	--	--	1	2

The Disease Situation

A rather wide occurrence of bacterial halo and stripe blights on oats typified the early part of the 1962 growing season in Illinois. These diseases were of no apparent consequence since the affected plants recovered with the onset of warm dry weather. Stem rust occurred on an average of 16 percent of the culms and occupied .03 percent of the stem area. It was most prevalent in the northern half of the state. For the state, an average of 77.6 percent of the plants were infected by the crown rust and 5.4 percent of the leaf area was occupied by the rust pustules. The crown rust caused an estimated loss of 3 percent in each of the last three years. An average of 50.6 percent of the culms were found infected with septoria black stem. The disease was most prevalent and severe in the northern third of the state running up to 5.9 percent of the leaf area affected. Scab, caused by Gibberella saubinetti was widely distributed in the state. On the average, there were 2.4 percent of the heads and .1% of the spikelets infected.

For the first time an alarming amount of residual toxicity due to Atrazine was observed in many oat fields treated the previous season for weed control in corn. The degree of toxicity varied with the topography of the field and the soil type, being most severe in low spots and on heavy soils with a high base exchange capacity. The symptoms were generally confused by many farmers with those produced by barley yellow dwarf virus (BYDV) and greenbug feeding. Malnutrition was also suspected.

BYDV disease followed its usual pattern and was present in low amounts in every field examined. It was particularly severe in several extremely thin fall and spring plantings intended for summer follow. It is thought that this type of planting may serve especially well for virus and vector reservoirs.

Although other diseases were present they did not present a threat to oat production during the 1962 season.

Oat Breeding

In the oat breeding program at Illinois, as in previous years, the major emphasis has been on improving yellow dwarf tolerance, rust resistance, grain quality and straw strength. Backcross lines, using Clintland types, Minhafer and Goodfield as recurrent parents and Albion as non-recurrent parent have been produced. Most of these lines are not equal to Albion in yellow dwarf tolerance, but are superior to any of the currently adapted varieties. Several of these lines will likely be placed in the Uniform North Central Nursery for testing in 1963. Preliminary tests at Urbana in 1962 indicated that some of the lines were equal to or superior to Minhafer in yield but some yielded considerably lower than Minhafer even after 5 backcrosses using Minhafer as recurrent parent. Also the maturity and kernel type of Minhafer was not completely recovered in some of the backcross lines.

Work is now under way and appears to be progressing satisfactorily to combine resistance to Landhafer attacking races of crown rust with BYDV tolerance and stiff straw.

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*** INDIANA ***

by F. L. Patterson, J. F. Schafer, R. M. Caldwell, L. E. Compton (Breeding, Pathology, Genetics) H. F. Hodges, R. R. Mulvey and I. D. Teare (Varietal Testing), M. L. Swearingin (Extension) S. K. Gilbert, and H. N. Lafever (Graduate Students)

The 1962 Season

Dry early April allowed timely seeding but a very hot early May limited tillering. June was cooler than average and favorable for oat production. Diseases were generally inconspicuous and caused little loss. The state average yield was 55 bu/A, second only to the 59 bu/A crop in 1960. The acreage seeded to oats increased about 5% over 1961 after a steady decrease since 1955.

Varieties

Clintland, Clintland 60, Newton, Putnam 61, Goodfield, Dubois (winter) and Norline (winter) are the principle varieties grown in Indiana. All except Clintland are recommended for 1963. Approximately 6,000 acres of these varieties (except Clintland and Dubois) were certified in 1962.

Genetics of Stem Rust Variants from Diepoxybutane Treatment of Clintland

The genetics of two induced variants in Clintland, resistant to race 7 of stem rust, were studied by S. K. Gilbert for Ph.D. research. The studies indicated a change at the complex A-D region.

The variants were similar to varieties with gene A in reaction to races 6, 8, 7 and 7a. There was some evidence that this involved a change at locus D recombinable with the A locus. Proof that the variants arose as mutants from diepoxybutane is not perfect but the most likely explanation.

Behavior of A Nullisomic From Clintland 60

A male sterile type from Clintland 60 has been studied in Ph.D. research by H. N. Lafever. Cytological evidence indicates that the male sterile is a nullisomic with near normal plant appearance. The nullisomics occur at somewhat greater than 50% frequency from selfing monosomics. The chromosome involved has not yet been identified. The relations of crown rust resistance of Landhafer (L), stem rust genes A, B, and D, and genes governing certain panicle characteristics with the chromosome pair missing in the nullisomic are under investigation.

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*** IOWA ***

by K. J. Frey, J. A. Browning, M. D. Simons, K. Sadanaga

Genetic Relationship between Cherokee and Nemaha Oat Varieties

The recorded parentages of Nemaha (C.I. 4301) and Cherokee (C.I. 5444) varieties of oats are (Victoria-Richland) x (Marota-Bond) and Bond x D69, respectively. However, plant breeders who have tested these two varieties have always been impressed with the amazing similarity of their appearance and performance. For example, when averaged over 10 years of testing in Iowa the mean yields, lodging percentages and scores, bushel weights, and plant heights have been nearly identical (table 1). Although such things could happen, it seemed extremely improbable that 2 varieties as similar in appearance and performance as Cherokee and Nemaha could really represent selections from crosses as diverse as the recorded parentages of these 2 varieties indicate.

As a part of a larger study an experiment was conducted to test the degree of genotypic similarity between Cherokee and Nemaha oat varieties; (a) by studying the variability among lines from the cross, Cherokee x Nemaha, to determine whether significant segregation was taking place, and (b) serological tests were made to determine the degree of homology between the proteins extracted from Nemaha and Cherokee pollen.

Ninety F_2 derived lines were tested in the F_4 generation for grain yield, plant height, and heading date. None of the mean squares for "among lines" was significant (table 2) indicating that the portions of the genotypes of Nemaha and Cherokee responsible for expression in the 3 characters, grain yield, plant height, and heading date, were the same.

Most proteins (antigens) when injected into animals cause the animal to produce antibodies, e.g., such reactions are utilized in vaccinations against some diseases in humans. The reactions between antigens and antibodies are highly specific, so this technique can be used to classify, qualitatively and quantitatively, specific proteins in a mixture.

Protein in seeds and/or in plants can probably be divided into 2 types, storage protein and "genetic" protein. The latter is conceived to be the enzyme protein which is closely related to the gene in the DNA ___ RNA ___ enzyme sequence of reactions. Pollen was selected as the plant part which was most likely to have little contamination of genetic protein with storage protein. Consequently, proteins extracted from pollen of oat varieties, Nemaha and Cherokee included, were used to incite antibody production in guinea pigs and to run serology tests.

Quantitative determinations were first made by determining the amount of reaction in the homologous systems, i.e. antibody tested against the antigen that incited it. Then the amount of reaction in the heterologous systems, i.e. antibody tested against an antigen which did not incite it, was expressed in percent of the homologous reaction. Obviously, the less the similarity between 2 antigens the lower would be the relative serological value.

The mean serological value for the Cherokee-Nemaha test was 107% which was not significantly different from 100%, and indicated that the antigen proteins of the pollen of these 2 varieties were qualitatively and quantitatively similar (table 3). For comparison purposes, the relationship of mean squares and serological tests for the cross, Cherokee x Mo. 0-205 are given in table 3.

Information from 3 sources, (a) long time performance records, (b) tests for segregation in a cross, and (c) serological studies, indicate that Cherokee and Nemaha varieties of oats have very similar and probably identical genotypes. The probability is very high that Nemaha and Cherokee not only came from the same cross, but are, in fact, the same genotype and strain.

Table 1. Mean performance of Cherokee and Nemaha oat varieties tested for a 10-year period in Iowa.

Attribute	Unit	Period tested	Variety		No. of Exps.
			Cherokee	Nemaha	
Yield	bu./a.	1953-62	80.5	81.0	100
Lodging	%	1953-57	9.0	8.0	40
	score	1958-62	3.0	3.1	40
Bushel weight	lbs./bu.	1953-62	33.8	33.7	100
Plant height	ins.	1953-62	36.0	36.0	30

Table 2. Pertinent mean squares from analyses of variance of data collected upon 90 F_2 derived lines from the cross Cherokee x Nemaha.

Source of variation	D.F.	M.S. Plant height	Heading date	Grain yield
Lines	89	2.56	1.57	28.7
Error	267	2.07	1.82	27.7

Table 3. Within-cross variance components for 3 quantitative characters and serological relationship of parents of 2 oat crosses.

Cross	Characters			Mean serological relationship of parents (%)[a]
	Plant height	Heading date	Grain yield	
Cherokee x Nemaha	0.12	0.00	0.25	107
Cherokee x Mo. 0-205	4.74**	4.12**	18.75**	48

a. Heterologous reaction as a percent of homologous reaction.

Crown Rust Race Identification

An interesting trend that first became apparent during identification of the 1961 crown rust collections appears to be well established by the 1962 collections. This trend concerns the reactions of the diploid Saia and its hexaploid derivatives to biotypes of the crown rust fungus. In past years Saia has ordinarily been very highly resistant, that is, immune or only slightly flecked, to all isolates of all common races. Hexaploid derivatives of Saia, which have been carried as "supplemental differentials", have been almost as resistant as Saia. Recently, however, biotypes of common races, particularly race 216, have appeared that produce small pustules on Saia. Under some conditions the reaction of Saia even approaches moderate susceptibility. More serious from the practical standpoint are the reactions of the Saia derivatives. They consistently show moderate to full susceptible when tested with such biotypes. Biotypes with this capability are not uncommon among the 1962 collections that have been identified to date. The field reaction of Saia and its derivatives to these biotypes are not known, and may well differ from the reactions of seedlings in the greenhouse.

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*** KANSAS ***

by E. G. Heyne, James Lofgren, C. O. Johnston,
Lewis Browder, E. G. Hansing, Ronald Livers,
Wayne L. Fowler, Max Urich, and Webster Sill, Jr.
(Manhattan)

Farmers in Kansas are growing less spring oats each year. There has been a slight increase in the acreage of winter oats but no varieties are available that are hardy enough for the state. Much of the spring oat acreage has been planted to soybeans.

The total grain production in Kansas for 1962 was estimated to be 9.8 million bushels. This is the smallest production since 1880. Only in the years 1866 through 1875 and in 1880 has there been less than 10 million bushels of oats produced in the state. The harvested acreage in 1962 was estimated at 428,000 acres. The first million acre crop was harvested in 1887. Since that time only in 13 years has there been less than one million acres of oats harvested. The last five years (1958-1962) all have been below one million acres. Production in 1962 was only average, 23 bushels per acre. There were no serious diseases or pests present over the state but the very dry months of April and May hurt the crop materially.

The spring varieties of oats recommended are Mo. 0-205, Andrew, Minhafer and Nemaha. Of the more recent varieties available Nehawka and Tonka appear the most promising. Tonka is very early and has an unusually high test weight under Kansas conditions. Its yield potential is not as high as desired but appears equal or better than Namaha. Cimarron and Arkwin winter varieties are recommended for a limited area in southeastern Kansas.

Winter oat bulks, originally received from F. A. Coffman, have been grown in Kansas since 1951. Some plants have survived or escaped winter killing each year. In 1960 approximately 99% of the plants were killed at both Manhattan and Hutchinson. The surviving plants were increased in 1961. About 90 lines were grown in replicated single rows at both Hutchinson and Manhattan in 1962. None survived at Hutchinson and only a few plants survived at Manhattan. From 1961 observations they appeared equal or better than Wintok. Wintok planted one week earlier at Manhattan than the lines selected from the bulks survived about 5%. This difference was attributed to the effect of date of planting. The Wintok used at Manhattan may also be different as it has been grown in this location since 1950-51 and seed from the surviving plants used each year. In a number of years only 5-10% of the plants have survived at Manhattan.

Drought during the first half of May kept rusts from developing throughout the state until very late in the season. Even in the rust nursery at Manhattan, where irrigation was used to produce conditions more favorable for rust development, only very light crown rust infections developed late in June. Stem rust was limited to bare traces. Crown rust centers of infection established in April died out due to hot windy weather during the first half of May.

For the second consecutive year yellow dwarf caused severe defoliation in Manhattan nurseries. Aphids were far more abundant than usual and apparently distributed the virus widely. Many hybrid lines were nearly destroyed but some exhibited excellent resistance. There apparently is plenty of BYDV resistance for successful programs of breeding for resistance in oats adapted to the central plains area.

The acreage of oats approved for certified seed production in Kansas declined sharply to the point of almost disappearing in 1962. Only 105 acres were approved in 1962, compared with 333 in 1961. Minhafer was the most popular variety for certification followed by Mo. 0-205 and Cimarron, a winter variety.

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*** KENTUCKY ***

by J. F. Shane (Lexington) and H. Randolph Richards (Princeton)

One production declined in 1962 in Kentucky, with a total production of less than 1 1/2 million bushels. The total acreage is only 43,000 acres, spring and winter types, but probably consists mainly of winter types. Average yield for the state was 34 bushels per acre. The Western Kentucky experimental average was 54.5 bushels per acre for winter oats and that for Lexington was 55.7 bushels per acre.

The Uniform Oat Winterhardiness Nursery, the Uniform Northern Winter Oat Nursery, a drill-strip winter oat test, and a date x rate x variety winter oat experiment were grown at the Western Kentucky Experiment Substation Farm at Princeton. Considerable differential winter killing was experienced as a result of little winter snow cover. Kentucky and Missouri selections showed very good winter hardiness in the tests.

Test weights were very low this season, with only four of forty-two varieties and selections reaching the 32-lb. standard weight. Lodging was considerable, resulting in the date x rate x variety experiment's not being harvested.

The Kentucky selection 54-488 (C.I. 7296) is being considered for possible increase and release. It has been outstanding in yield, test weight, straw strength, and winter survival. It is an early, medium short strain. Head selections are being grown and compared at Lexington in an attempt to obtain a pure line from this selection. Some off types have been observed in plots in the various tests.

No red leaf was observed in any of the Western Kentucky tests, but Ascochyta leaf spot was noted on three selections (see publications list).

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*** MICHIGAN ***

by J. E. Grafius and A. H. Ellingboe

The 1962 season in Michigan was favorable to oat production with yields of 140 bushels per acre in some areas. Garry and Rodney continue to be our best standard varieties.

A new pest (Oulema melanopa) has been reported in southwestern Michigan. This beetle feeds on oats and if sufficiently numerous will destroy the crop. The area has been quarantined and entomologists are studying the life cycle. Apparently, it is very difficult to control except by sprays. It originates in Europe and its introduction is the result of the seaway. At worst, it could constitute a very serious pest of small grain.

Two new varieties are being increased for possible release in 1964. These are Marne^2 4 x Bvr. x Gy. 2 x Ctn. 3 x cld, C.I. 7684 and Bvr. x Gy 2 x Ctn 3 x cld 4 x Minor, C.I.7670. These lines have been grown in the Uniform Early Oat Nursery for two years. There are only 50 bushels of each at present. They have not been named.

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*** MINNESOTA ***

by W. M. Myers, R. E. Anderson, R. A. Kleese, L. L. Pointer, M. B. Moore and B. J. Roberts

Rolan Anderson who was associated with the oat project from June, 1961 through December, 1962 is no longer with the project. He is presently completing his work toward the Ph.D. degree. Roger Kleese received the Ph.D. degree in November, 1962 from Iowa State University under Dr. K. J. Frey and is now working one-half time on the oat project.

Effect of Race 8 of Stem Rust on Yield Components in Oats

by L. L. Pointer and B. J. Roberts

The nature and extent of damage caused by race 8, stem rust, was studied in 18 varieties of oats. The performance of a variety was evaluated by determining the yield and quality under rusted and non-rusted conditions. A severe epiphytotic of race 8 was induced in the rusted plots in the field by inoculating rust spreader rows and allowing the rust to spread into the test plots. The non-rusted plots were sprayed with a fungicide to prevent the presence of the rust. The inoculations were timed so that spread of rust coincided with heading in the oats.

Four factors of yield and quality were studied: 1) bushels per acre, 2) test weight, 3) 200 kernel weight and 4) 200 groat weight. Also, seed weight

and seed number on a panicle basis were determined at five day intervals from heading date until harvest. The varieties studied represented the full range of resistance to race 8. Two Saia varieties, C.I. 6954 and 7010; four varieties containing the BC complement; four varieties containing the D gene; four varieties containing the A gene; and four varieties known to be susceptible to race 8 were used for this study.

It was found that the varieties classed as resistant were generally less affected by the rust, but that within a group of varieties having the same genetic resistance there was considerable variation in the amount of damage caused by rust. Similarly, among varieties classed as susceptible some were more severely damaged than others. The rust did not consistently affect all four factors for yield and quality in the same manner. The seed number per panicle determinations appeared somewhat independent of rust, with threshing technique causing some loss of unfilled kernels.

As the variations between varieties having the same genetic resistance are consistent with previous years' data, further investigation will be carried out to determine the basis for these consistencies.

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*** MISSISSIPPI ***

by Donald H. Bowman and Paul G. Rothman
(Delta Branch Experiment Station, Stoneville)

Growing conditions generally were favorable over the State for the 1962 oat crop and yields were above the 10-year average. Over 21 inches of rain in November and December prevented late oats seeding. The total State acreage was approximately 26 percent below the 1961 acreage.

On a state-wide basis diseases were of only minor importance in the 1962 crop. Crown rust appeared in localized areas but its spread was limited by dry weather in April and May. Race 216 was predominate in the Stoneville area occurring in 15 of 25 collections. Race 326 was identified from four of the collections. Other races identified were 264, 276, and 295. Race 202 was not identified from any of the collections. Crown rust was quite severe in the nursery at Stoneville as a result of natural and artifically induced infection.

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*** MISSOURI ***

by J. M. Poehlman, Charles F. Hayward, Paul H. Hoskins,
Thomas D. Wyllie, (Columbia); Carl Hayward (Mount Vernon);
and Arnold Matson (Gideon).

The Missouri oat acreage continues to decline. The 316,000 acres harvested in 1962 is the smallest on record. This compares with 1.2 million acres in 1952 and 2.2 million acres in 1942. Early spring was unfavorable for seeding and many acres were diverted to other uses because of prospective low yields from late plantings. Mean temperature during May was 8 degrees above normal, and oats were forced into heading about 10 days earlier than usual. This condition combined with a shortage of soil moisture caused the primary tillers of the early maturing varieties to head out extremely short. A good rain occurred at this point with much late tillering resulting and late maturing varieties heading out normally. Usually, in Missouri, the early varieties head normally and the late varieties are injured.

Breeding of spring oats is being concentrated on the improvement of Nodaway for wider adaptation, and crown rust and yellow dwarf resistance. Selections from Selecta DL x Nodaway showed good crown rust resistance in the field. Artificial inoculations with crown and stem rust failed to develop in 1962 but some natural infection occurred on the late tillers. Very little yellow dwarf was present in Missouri in 1962.

It has been possible to select winter oat types from the "hardy x hardy" crosses supplied by Mr. Coffman that are superior in hardiness to Wintok, (See reports of uniform nurseries). Many of these hardy selections have good yield and seed quality, but many are also tall and nearly all lack disease resistance. The winter oats nursery at Columbia, which is about 150 miles north of where the commercial Missouri winter oat acreage is grown, was almost completely killed in 1962. Killing at Columbia was intensified by heavy fall growth of the oats which apparently weakened the plants to such an extent that they failed to harden properly. Late plantings, with less fall growth, survived better than the early planting. Again, this is contrary to what we normally observe at Columbia.

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*** NEW YORK ***

by N. F. Jensen, G. C. Kent, E. J. Kinbacher (USDA)
W. F. Rochow (USDA), L. J. Tyler.

Recent crop production estimates for New York show 569,000 harvested acres, 29,019,000 bushels, and 51.0 bushels per acre. Total harvested acreage continued to decline and is the lowest acreage for many years. The per acre yield is considered very good in view of the drouth conditions which prevailed over much of the state.

Foundation field production of the new Niagara variety produced enough seed to cover the advance reservations and indications are that at least 2,000 acres of Niagara will be grown for seed purposes in 1963. First commercial sale of Certified Seed will be for the spring of 1964.

A Breeders Seed field of new stock of Tioga was grown at Ithaca in 1962. Tioga is expected to follow Niagara in release sequence, with first commercial sale of Certified Seed projected for the spring of 1965.

C.I. 7811, which was in the 1962 Northeastern and 1962 North Central nurseries, is being considered for release following Tioga.

Because consistent crown rust infection seems to occur at this location, Aurora, New York will become the base for part of the oat breeding work. This location is approximately 30 miles north of Ithaca and abounds with the presence of buckthorn.

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*** NORTH DAKOTA ***

by David C. Ebeltoft and G. S. Smith

1962 Season

Even though crop production was far below normal in the Red River Valley, the oat production for the state was the highest on record. 1,886,000 acres were harvested with an all-time record average yield of 52 bushels per acre. The previous high yield was 41.5 bushels per acre recorded in 1912. The harvested acreage was up 625,000 acres over last year and 20,000 acres over the long-time annual average of 1,863,000 acres.

State Yield Trials

Fargo had no yield data this year, due to excessive moisture, and Dickinson was hailed out. However, reports from five stations gave us a good sampling of the entire state as far as oat performance was concerned. Russell, Burnett, Minton and Ajax led in yield followed by Rodney and Garry. Gopher was far behind this year, though it did not carry a great deal of rust. Nodaway and Putnam 61 appear to be somewhat lower in yielding ability. The eastern part of the state had a fairly high incidence of crown rust and some stem rust. The varieties attacked would indicate that the stem rust was predominently race 6.

Bingham Selections

Last year Mr. Lund noted the fine performance of three Bingham selections at Williston under irrigation. The performance was excellent again as shown on the following table. Incidentally, these selections carried 100 percent infection of crown rust at Langdon this year.

Yield Trials at Williston, 1962

Variety	Dryland T. Wt.	Dryland Yld.	Irrigated T. Wt.	Irrigated Yld.	Lodging
CI 7572[1]/		88.5	35.0	134.4	0
CI 7589[1]/		75.5	35.0	130.0	0
CI 7571[1]/		79.9	35.5	121.5	0
Garry	33.5	69.1	35.5	118.1	20
Rodney	34.0	72.6	36.5	105.1	50
Ajax	34.0	69.9	36.0	91.5	50

1/ Bingham selections

Breeding Program

Earliness and yield has been our goal and we feel that we are nearing it in some of our Ransom x Ajax crosses. However, we are not satisfied with the kernel type and have yet to attain what we desire. Of course, we still have to consider rust resistance and straw strength.

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*** OHIO ***

Oat Production and Research in Ohio

by Dale A. Ray (Columbus)

The 1962 Season

The limited acreage of winter oats grown in southern Ohio made rapid vegetative growth following excellent moisture and temperature conditions for establishment. In January severe freezing temperatures following heavy rainfall and accompanied by lack of snow cover caused extensive winter-killing.

Weather and soil conditions permitted early seeding of the spring oat crop but an extended period of below-normal rainfall in the middle of the growing season resulted in some stunting of vegetative growth. The oat crop headed nearly a week earlier than average. Some excellent yields were obtained in areas where local rains were timely.

The common diseases of oats were present in minor incidence and did not appear to cause any serious loss in yield.

1962 Oat Production

The estimated 48,314,000 bushels of oats produced in Ohio represented an increase of 30 percent in 1962 above the 1961 production figure. The production

in 1962 was only slightly below the previous ten-year average. Approximately 100,000 more acres of oats were harvested in 1962 than in 1961 and the average yield of 58.0 bushels per acre was the second highest yield on record for the state.

1962 Acreage of Certified Seed Oats in Ohio

The Certification Service of the Ohio Seed Improvement Association has reported that 11,995 acres of oats in Ohio were grown in 1962 for state and interagency certification.

Variety	Foundation acres	Registered acres	Certified acres
Clintland 60	21	604	7772
Goodfield		175	1046
Putnam 61	10	176	332
Clinton 59			494
Garry			418
Clintland			403
Andrew			178
Clarion		25	104
Rodney		16	100
Oneida			107
Dodge	14		

Oat Variety Recommendations

Spring oat varieties recommended for 1963 seeding in Ohio are Clintland 60, Goodfield, Dodge, Clarion, Putnam 61 and Rodney. Norline, Dubois and Bronco varieties of winter oats are acceptable for seeding in southern Ohio.

Oat Variety Trials

Twenty spring oat varieties were compared in a yield trial at two locations and ten of the varieties were grown at five additional test farms. Late-maturing Garry and Rodney were outstanding in performance at the central and northern locations, while Goodfield, Clintland 60 and Putnam 61 were highest in yield in the southern Ohio trials where the late-maturing varieties lodged severely.

The winter oat varieties, Dubois and Bronco, survived only at the southeastern Ohio farm, where yields were reduced about 50 percent by winterkilling in both varieties.

Oat Investigations

The spring oat breeding materials were screened closely for straw-strength and earliness. Following heavy winterkilling in the winter oat nursery, selection among surviving progenies offered promise in the development of improved lines

adapted to survival under winter conditions in Ohio. Several of the higher-yielding spring oat selections grown in preliminary yield nurseries appear to be too late in maturity for adaptation. Data in study of the effects of oat seed grading and chemical treatment on stand, performance and certain agronomic and pathological traits in spring oat varieties are being summarized by Robert W. Miller in presentation for his Ph.D. thesis.

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*** PENNSYLVANIA ***

Winter Oats

by H. G. Marshall (USDA)

Although weather conditions were generally unfavorable for winter oat production in Pennsylvania during 1962, results were better than expected. In many cases, a lack of moisture in the fall of 1961 resulted in delayed germination and poor fall growth. The winter was very severe and was characterized by very little snow cover and prolonged periods of low temperature. Good survival generally occurred where fall establishment was good. Yields were generally reduced by a severe drought during the summer, but their earlier maturity provided an advantage for winter oats relative to spring oats.

The severe winter was an asset from the selection viewpoint. Only trace survival occurred in a large winter oat nursery located near University Park, and it is anticipated that scattered survivors from segregating populations will prove of value in the future. A strong differential winter kill also provided valuable information about varieties, selections, and bulk populations included in nurseries in southern Pennsylvania.

The varieties C.I. Nos. 7495, 7484, and 7767 were the most promising of unnamed varieties in advanced tests during 1962, but they apparently do not have sufficient straw-strength to compete with Norline under Pennsylvania conditions. C.I. 7500, of interest in the past because of good winter survival, straw-strength, yield, and kernel type, did not yield well during 1962. However, the average yield of this variety in southern Pennsylvania tests for the three-year period 1960-62 is 2.4 bu./A. better than that for Norline. Approximately one acre of increase was seeded to this variety in the fall of 1962, but its future will not be decided until the results for 1963 are available.

Numerous bulk populations resulting from a multiple crossing program were advanced in generation at this station and at Aberdeen, Idaho, during the summer. Certain of these bulk populations are being utilized in a study to determine whether it is feasible to eliminate entire populations as early as the F_3 on the basis of poor performance in field tests and in controlled freezing tests.

Mr. William H. Fry is currently a graduate research assistant on the winter oat project and is working toward the MS degree. He is conducting research concerned with the use of nutri-culture in controlled freezing tests.

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*** TENNESSEE ***

by E. L. Smith (Knoxville)

The oat breeding program presently consists of two general areas of investigation. One area is concerned with the development of early-maturing lines with acceptable grain yielding capacity, and with straw strength equal to that of the variety, Blount. Several early-maturing lines are in the advanced testing stage but none appears to have the desired level of straw-strength. However, a series of more promising selections derived from complex crosses are now being evaluated in preliminary tests.

The development of rust-resistant, forage-type lines is the other important objective in the present program. For this purpose, spring-type, hexaploid derivatives of A. strigosa are being utilized as sources of crown rust resistance in crosses with Forkedeer and LeConte. Progenies from these crosses were seeded in the field in early September. In November, a heavy crown rust infection developed in this material and rust readings were obtained on BC_1 plants, and in F_3 and F_4 head rows. Several of the most promising, rust resistant segregates will be backcrossed to Forkedeer and LeConte.

Professor N. I. Hancock retired on August 31, 1962, after 34 years of service as a plant breeder at the University of Tennessee. He was quite active in the field of oat breeding and was responsible for the development of Fulwin, Tennex, Forkedeer, LeConte, and Blount oat varieties.

Howard Early was recently appointed as research assistant in small grains. His MS thesis problem will consist of studies on the nature and inheritance of fatuoid off-types occurring in LeConte oats.

E. L. Smith recently joined the staff at the University of Tennessee to replace Professor Hancock as small grain breeder.

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*** TEXAS ***

by I. M. Atkins, Paul E. Pawlisch, J. H. Gardenhire (Denton), K. B. Porter (Bushland), Dennis Peier, James R. Justin and M. C. Futrell. Departments of Soil and Crop Sciences and Plant Sciences, Texas A & M College in cooperation with the Crops Research Division, ARS, USDA.

The Texas oat crop suffered the most severe damage by low temperatures since 1949. The damage by low temperatures was further increased by one of the driest springs on record. Spring rains, which usually start in March, did not occur generally until late May. The very low temperatures, near zero as far south as Waco, were accompanied by very high winds during January 9-14. Many fields of oats were killed and most all leaf tissue was killed to the ground in other fields. This situation was followed by very high mean temperatures throughout February and a second freeze from February 28-March 2 in which temperatures dropped as low as 14° F as far south as Waco.

An attempt was made to evaluate the loss from this freeze, something we have never before done. Estimates were obtained from County Agents in all counties of the percentage of the acreage killed, the damage to that not completely killed, the number of days grazing lost, the value of this to growers etc. These estimates were summarized by Extension Districts. From known acreages in these areas, the loss in grain, forage and the cost of seeding this acreage were calculated. Other losses which could have been included, but were not, were the cost of reseeding this acreage to spring oats or other crops and the loss in lower yields expected from spring-sown oats. From this complex and perhaps crude method of estimating, we arrived at a figure of 14 million dollars loss to the oat crop of Texas.

The seeded acreage of oats for the 1962 crop was 2,021,000 but only 806,000 acres were harvested, less than half that of the ten-year average. Diseases were much below normal in severity this season as a result of the freeze and very dry spring weather.

The new variety Alamo-X gave a good record of itself in commercial production and was discovered to be significantly more hardy than Alamo during this severe winter season. Strain 57C1716, C.I. 7912 proved to be rather tender and its adaptation will be limited, should it be released. The severe freeze provided information on hardiness of all strains. Three strains developed at the Denton station proved of unusual promise in hardiness and forage growth. These include Mustang Selection 59D2857 and Bronco x Bond-Rainbow-Hajira-Joanette, Selection 239-58-6. While these do not have sufficient rust resistance for South Texas, they appear of unusual value for North Texas and have attractive plant and seed characteristics.

Tests of F_3 lines of Russian 77, C.I. 2898, with commercial varieties indicate the greenbug resistance of this variety is controlled by a single gene. Crosses between Russian 77 and other sources have been made for further studies.

The wild and feral oat collection continues to yield information of interest and value. About 100 strains are being grown in Puerto Rico this winter, where they

will be subjected to pure races of rust. They are being tested in the greenhouse to selected races of crown and stem rust. Ascorbic acid tests of these lines have been made at Bushland and these results will be related to hardiness at three locations.

Since August 1961 the cross and three backcrosses to the commercial parent have been grown in the program to incorporate stem rust resistance into Suregrain oats. This has been possible with the air-conditioned chamber described in last years report. Stem rust resistance is also being incorporated into certain other varieties.

The Denton and Trelle dwarfs have been crossed, as have also certain other short stature strains, to study the inheritance of stature and develop oats better suited to high production levels.

Forage yields of wheat, barley and oats, including the diploid Saia, have been studied at several fertility levels and various clipping treatments to simulate grazing. On the low fertility Lufkin sand soil at College Station, all types and varieties respond to a greater degree in forage growth than in grain production. An experiment to determine the value of clipping, visual estimates and other methods of evaluation by comparing these measures with actual grazing with cattle has been established at McGregor Texas.

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*** UTAH ***

by R. W. Woodward (Logan)

Oats did well in the irrigated areas of Utah. Among the top yielding entries were Zanster, Russell, Park, Markton, R.L. 2130.50 and C.I. 7578. Yields ranged up to 180 bushels per acre with not too much lodging except in Markton and Russell. No trace of disease was observed in any oat. Some of Mr. Coffman's new strains look very good and would warrant release if adjoining states decided to do so. Oat production in Utah is not of major importance at this time because of the greater production and demand for wheat and barley.

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*** WISCONSIN ***

by H. L. Shands

Wisconsin State Oat Yields and Variety Performance

The 1962 season was generally good for small grain growing and harvesting except for drought in some areas of Wisconsin, especially the southeastern section. The state average yield for oats was 57 bushels per acre, second only to the all time high of the 61 bushel average in 1958. Bushel weights were generally high.

There were 2,229,000 acres, or down 93,000 from 1961. Yield was a little more than 127 million bushels, or down 3.4 percent of the ten-year average 1951-1960. Though acres have dropped, acre yields have increased almost enough to maintain high total production. The Wisconsin Crop Reporting Service did not make an oat varietal usage survey in 1962. Beedee was the leading variety in 1961 and probably increased percentagely in 1962.

Variety Performance

The Wisconsin Seed Certification Service provided yield reports for varieties certified in Wisconsin. It is believed that the actual yields were higher than reported in previous years and in 1962, since first payment of the growers' certification charges are estimated partly on the basis of yield reports. It is hoped that more accurate reports will become available. These reports showed a nine-variety average drop in yield of 3.5 bushels per acre in 1962 with a range of 1.7 to 7.4. It is reasoned that the two years' reports should have been very similar. The average yields of varieties on a non-paired basis is given in Table 1. The newcomer Garland averaged 61.7 bushels per acre or 4.4 more than next highest Beedee. The Garland average was 1.5 bushels more than the highest variety average in 1961. This variety appears to be rather popular.

Table 1. Seed Growers' reports of non-paired yields of oat varieties in Wisconsin in 1962 with departure from 1961.

Variety	No. of Growers	Yield in Bu/A	Departure from 1961	Variety	No. of Growers	Yield in Bu/A	Departure from 1961
Ajax	14	50.4	-3.4	Garland	111	61.7	--
Beedee	95	57.3	-1.7	Garry	29	56.0	-3.2
Branch	9	53.6	-1.9	Goodfield	19	53.9	-3.5
Clintland 60	11	46.8	-7.4	Portage	60	55.1	-5.1
Dodge	99	56.2	-2.2	Sauk	17	51.6	-3.1

Crown rust was a little greater in 1962 than 1961, causing an estimated 1/ damage of 1.0 percent. Portage, Beedee and Dodge had less infection than several other varieties. There was limited stem rust infection of plants with the A gene, indicating the presence of race 8. Septoria infection of lower leaves occurred soon after heading in the Madison nursery and stem infection was prevalent in the Marshfield area.

Lodi Released

Lodi (C.I. 7561), a new variety was distributed to growers of certified seed for the first time in 1963. This selection is from the cross (Richland x Bond) x (Garry-Hawkeye-Victoria). The first two crosses were made in 1935, the next was made in 1947, and the final in 1953. It has been tested for four years at Madison and at several other locations in Wisconsin. It has also been tested for three years in the Uniform North Central Nursery conducted by H. C. Murphy. Financial support has been provided in part by the Quaker Oats Company.

Performance data in Wisconsin indicate that Lodi is high in yield. The straw is tall and resists lodging as well as any other variety except for Goodfield. Heading and ripening dates are similar to those of Garry. Hull color is a light yellow if nonweathered, but may be a dull reddish-yellow when weathered. The kernels are somewhat long and the grain has intermediate test weight per bushel.

Lodi is resistant to smut and has the A and B genes conditioning stem rust response. It appears moderately resistant to leaf rust but showed considerable infection when seed was planted very late at Madison in 1962. Lodi is susceptible to red leaf and is intermediate in reaction to stem Septoria.

It is expected that Lodi will partly replace some of the Wisconsin acreage of Ajax, Branch, Garry, Portage, Rodney, and Sauk.

As with other varieties, quite a number of students and station workers helped in developing Lodi. Personnel of the University Experimental Farms (formerly Branch Stations and other units) assisted in testing Lodi in final phases.

Personnel items: R. A. Forsberg returned to Wisconsin in January 1963 to accept a staff position in the Department of Agronomy and, along with other assignments, will be concerned with small grains. J. J. Pavek and D. M. Wesenberg are graduate assistants working with oats. D. W. Burrows, D. C. Janisch and P. A. Salm are graduate assistants in small grains. R. D. Durbin in USDA and Plant Pathology has replaced L. S. Wood who accepted a position at South Dakota in March 1962.

Deceased: Emeritus Professor B. D. Leith February 3, and Emeritus Professor J. G. Dickson March 1, 1962.

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1/ By a committee.

*** V. NEW OAT VARIETIES ***

a) List:

Variety	C.I. No.	State
Neal	7440	Nebraska
Lodi	7561	Wisconsin
Bonkee	7563	Iowa
Sierra	7706	California
Basin	5346	Montana
Roanoke	7413	Virginia
Fairfax	7417	Georgia
Cleo	6740	USDA

b) Descriptive list of McCurdy varieties:

Jewell

Jewell (C.I. 7598 - M146) originated by W. O. McCurdy & Sons, Fremont, Iowa. It is a selection of the cross Clinton-Santa Fe- MO 0-200 Ajax. High yield, good standing ability with a very wide adaptation. The cross was made in 1951 & selection made in 1954.

Colfax

Colfax (C.I. 7595, McCurdy No. M623) originated at W. O. McCurdy & Sons, Fremont, Iowa. It is a selection of the cross Columbia, Clinton-Landhafer-Sante Fe-MO 0-200, with good yield, test weight, and disease tolerance. The cross was made in 1951 by LeRoy McCurdy with the final selection in 1955 by Carl L. Koehler. It has been tested in Iowa and Minnesota. With best adaption in the southern one-third of Minnesota and northern two-thirds of Iowa.

Goldfield

Goldfield (C.I. 7597 McCurdy No. M352) originated at W. O. McCurdy & Sons, Fremont, Iowa. It is a selection from the cross Clinton-Santa Fe- MO 0-200-Ajax. Made in 1951 by LeRoy McCurdy and selected by Carl Koehler in 1955. It has high yield, good test weight. Area of adaption northern two-thirds of Iowa and southern one-third of Minnesota.

Goldcrest

Goldcrest (C.I. 7596 M144) originated at W. O. McCurdy & Sons, Fremont, Iowa. It is a selection from the cross Columbia-Clinton-Santa Fe-Gopher. The cross was made in 1951 by LeRoy McCurdy and selection made in 1954. It has good yield, early maturing with high test weight.

Mahaska

Mahaska (C.I. 7599 M469) originated at W. O. McCurdy & Sons, Fremont, Iowa. It is a selection of Clinton-Santa Fe-MO 0-200 Nemeha. The cross was made in 1951 by LeRoy McCurdy. The final selection was made in 1955 by Carl L. Koehler. It is a very early variety with good yield and test weight.

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*** C.I. NUMBERS ASSIGNED TO OATS DURING 1962 ***

by J. C. Craddock, USDA, Beltsville, Maryland

CI Number	Name or Designation	Pedigree	Origin and/or Source
7770	MANOD (S.235)	Tama x Sta. Sel. 01750/11	Wales
7801	PENDEK	Fgn x Bi	Netherlands
7803	Mo. 04792	Col x Mrn (Reselection of Macon)	Missouri
7804	Mo. 04837	Col x Mrn (Reselection of Macon)	"
7805	Mo. 04935	Vtra 2x Hj x Bnr 3x Vtry 2x Hj x Ajax $4x^3$ Mo. 0-205	"
7806	Mo. 04944	Vtra 2x Hj x Bnr 3x Vtry 2x Hj x Ajax $4x^3$ Mo. 0-205	"
7807	Abd. 60-1069	Cld 6x Osg 4x Bda 2x Hj x Jt 3x SF 5x Ovl 4x Bda 2x Hj x Jt 3x SF	USDA-Idaho
7808	Abd. 61-473	Wtk 2x Ctn^2 x SF 5x Bda 2x Hj x Jt 3x SF 4x Mo. 0-205	"
7809	Abd. 60-477	Wtk 2x Ctn^2 x SF 5x Bda 2x Hj x Jt 3x SF 4x Mo. 0-205	"
7810	Abd. 61-481	Wtk 2x Ctn^2 x SF 5x Bda 2x Hj x Jt 3x SF 4x Mo.0-205	"
7811	N.Y. 5279a1B-3B-70	Alo 4x Gy Sel.-5 3x Gdw 2x Vtra x Rb	New York
7812	Ill. 58-1027	Bcn 2x Hwk x Vtra 3x Rdy	Illinois
7813	Mich. 56-22-1527	Bvr x Gy 2x Ctn 3x Cld 4x Mrn	Michigan
7814	Mich. 56-22-1563-1	" " " " " " " " "	"
7815	Mich. 56-20-1451	Bvr x Gy 2x Ctn 3x Cld 4x C.I. 5093 (B-0513)	"
7816	N. Dak. 56.21 A-1-1-1-3	Gy sel. 4x Ctn x Vtry 3x Vtra 2x Hj x Bnr	N. Dakota
7817	Tex. 58D-1197	Wild-type of Red Rustproof	Texas
7818	Abd. 60-1157	Wtk 2x Ctn^2 x SF 5x Bda 2x Hj x Jt 3x SF 4x Mo.0-205	USDA-Idaho

CI Number	Name or Designation	Pedigree	Origin and/or Source
7819	Belts. "DEF" 61-66	Wtk 2x Ctn^2 x SF 5x Bda 2x Hj x Jt 3x SF 4x Mo.0-205	USDA-Beltsville
7820	Belts. 60-XQ56BG	Osg 4x Bda 2x Hj x Jt 3x SF 5x Cld	USDA-Beltsville
7821	Abd. 60-1160	Wtk 2x Ctn^2 x SF 5x Bda 2x Hj x Jt 3x SF 4x Mo.0-205	USDA-Idaho
7822	Purdue 5259A1-80	Ctn ^{2}x Mrn 6x Ctn ^{2}x Ark 674 4x D69-Bd 3x Hj x Jt 2x Btra 5x Ctn 59 ^{7}x Lh	Indiana
7823	Tex. 58D-1198	Wild-type of Red Rustproof	Texas
7824	Tex. 58D-1233	" " " " "	"
7825	Tex. 58D-1224	" " " " "	"
7826	Tex. 58D-1232	" " " " "	"
7827	Tex. 58D-1203	" " " " "	"
7828	Tex. 58D-1213	" " " " "	"
7829	Tex. 58D-1280	" " " " "	"
7830	Tex. 58D-1228	" " " " "	"
7831	Tex. 58D-1252	" " " " "	"
7832	Tex. 58D-1278	" " " " "	"
7833	Tex. 58D-1240	" " " " "	"
7834	Tex. 58D-1207	" " " " "	"
7835	Tex. 58D-1211	" " " " "	"
7836	Tex. 58D-1221	" " " " "	"
7837	Tex. 58D-1282	" " " " "	"
7838	Tex. 58D-1201	" " " " "	"
7839	Tex. 58D-1243	" " " " "	"
7840	Tex. 58D-1206	" " " " "	"
7841	Tex. 58D-1222	" " " " "	"
7842	Tex. 58D-1230	" " " " "	"
7843	Tex. 58D-1242	" " " " "	"
7844	Tex. 58D-1210	" " " " "	"
7845	Tex. 58D-1229	" " " " "	"
7846	Tex. 58D-1281	" " " " "	"
7847	Tex. 58D-1202	" " " " "	"
7848	Tex. 58D-1218	" " " " "	"
7849	Tex. 58D-1212	" " " " "	"
7850	Tex. 58D-1219	" " " " "	"
7851	Tex. 58D-1226	" " " " "	"
7852	Tex. 58D-1236	" " " " "	"
7853	Tex. 58D-1216	" " " " "	"
7854	Tex. 58D-1225	" " " " "	"
7855	Tex. 58D-1227	" " " " "	"
7856	Tex. 58D-1235	" " " " "	"
7857	Tex. 58D-1237	" " " " "	"
7858	Tex. 58D-1215	" " " " "	"
7859	Tex. 58D-1199	" " " " "	"
7860	Tex. 58D-1285	" " " " "	"
7861	Tex. 58D-1214	" " " " "	"
7862	Tex. 58D-1200	" " " " "	"

CI Number	Name or Designation	Pedigree	Origin and/ Source
7863	Tex. 58D-1204	Wild-type of Red Rustproof	Texas
7864	Tex. 58D-1231	" " " " "	"
7865	Tex. 58D-1234	" " " " "	"
7866	Tex. 58D-1239	" " " " "	"
7867	Tex. 58D-1217	" " " " "	"
7868	Tex. 58D-1241	" " " " "	"
7869	Tex. 58D-1208	" " " " "	"
7870	Tex. 58D-1223	" " " " "	"
7871	Tex. 58D-1238	" " " " "	"
7872	Tex. 58D-1220	" " " " "	"
7873	Tex. 58D-1209	" " " " "	"
7874	Tex. 58D-1205	" " " " "	"
7875	DIAMANT		Netherlands
7876	AVON	Ballidu 2x Mulga x Laggan	Australia
7877	Ill. 60-3018	Ctn x Fkd 2x Nys	Illinois
7878	N.Y. 5723aB-4B	Adv x Nys 2x HC x Nys	New York
7879	Belts. 61-522	Bl 6x Lh x^4 Ctn 5x Osg 4x Bda 2x Hj x Jt 3x SF	USDA
7880	Belts. 61-516	Bl 6x Lh x^4 Ctn 5x Osg 4x Bda 2x Hj x Jt 3x SF	"
7881	Belts. 61-525	Bl 6x Lh x^4 Ctn 5x Osg 4x Bda 2x Hj x Jt 3x SF	"
7882	Pa. 59ABC117-7	Wtk Sel. x HC	Pennsylvani
7883	Ill. 60-3006	Ctn x Fkd 2x Nys	Illinois
7884	HULL-LESS FULGHUM	Selection from Fulghum	Georgia
7885	Ill. 60-3021	Cmr x Nys	Illinois
7886	S. C. 59-9803	Arl 3x Wtk 2x Ctn^2 x SF (Sumter Resel.)	S. Carolina
7887	S. C. 59-9807	Arl 3x Wtk 2x Ctn^2 x SF (Sumter Resel.)	" "
7888	S. C. 60-13459	Arl x Dlr 2x Tris 3x Arl	" "
7889	S. C. 60-14189	Arl x Dlr 2x Tris 3x Arl	" "
7890	ARLINGTON HVR SEL.	H. victoria-resistant Arlington (C.I. 4657) sel.	" "
7891	Belts. 61-140	Bl 6x Lh x^4 Ctn 5x Osg 4x Bda 2x Hj x Jt 3x SF	USDA
7892	Note: This C.I. number to be discontinued. Duplicate of C.I. 7760		
7893	Belts. 61-489	Wtk Sel. x HC	USDA
7894	Belts. 61-491	Wtk Sel. x HC	"
7895	Belts. 61-492	Wtk Sel. x HC	"
7896	Mo. 05048	Cmr 2x Hj x Jt 3x Arl 2x Ctn^2 x SF	Missouri
7897	OCTOPLOID 1	Aa(25) x As (Nish. 60-5003-10)	Japan
7898	OCTOPLOID 2	Aa(25) x As (Nish. 60-5003-16)	"
7899	OCTOPLOID 3	Aa(25) x As (Nish. 60-5012-3)	"
7900	OCTOPLOID 4	Aa(25) x As (Nish. 60-5012-7)	"
7901	OCTOPLOID 5	Ab x As (Nish. 60-5101-9)	"
7902	OCTOPLOID 6	Ab x As (Nish. 60-5101-21)	Japan
7903	OCTOPLOID 7	Ab x An(98) (Nish. 60-5057-6)	"
7904	OCTOPLOID 8	Ab x An(98) (Nish. 60-5057-8)	"
7905	OCTOPLOID 9	Ab x An(98) (Nish. 60-5057-24)	"

CI Number	Name or Designation	Pedigree	Origin and/or Source
7906	JOHNSON SEL.	Crown-rust resistant sel. from Johnson (CI 5105)	Iowa
7907	MAGISTRAL (PI 258724)		Russia
7908	Fla. 59-514	Arl 3x Wtk 2x Ctn ^{2}x SF 4x Flr	Florida
7909	Delta 61155-1	Dlr 4x Lee x Vtra 2x Fwn 3x Ctn ^{2}x SF	Mississippi
7910	Delta 6116-2	Dlr ^{2}4x Lee x Vtra 2x Fwn 3x Ctn ^{2}x SF	"
7911	Delta 6107	Dlr x Lh 2x Dlr x Mvl	"
7912	Tex. 57C1716	Fwn 2x Lee x Vtra 3x RR 4x Vtra x Rld 5x Bd x Rb 2x Hj x Jt 3x Lh	Texas
7913	Delta 6130	LMHJA x Dlr	Mississippi
7914	Delta 6171	" " "	"
7915	Ark. 2-151	Mg x Vg 48-93 2x Dso	Arkansas
7916	Delta 801	Pls x Dlr 2x K.H.C. R.48	Mississippi
7917	Purdue 5711D3-1-4-21	Rxt x RL 1276 2x Ajax x RL 1276 3x Ctn x Bd 2x P.I. 174544 4x Ptm ^{4}x LMHJA	Indiana
7918	Purdue 5711G3-3-5	Rxt x RL 1276 2x Ajax x RL 1276 3x Ctn x Bd 2x P.I. 174544 4x Ptm ^{4}x LMHJA	"
7919	Purdue 549B7-12P-2-2-25-2	Rxt x RL 1276 2x Ajax x RL 1276 3x Ctn x Bd 2x P.I. 174544	"
7920	Purdue 549B8-14P-3-1P-2-3	Rxt x RL 1276 2x Ajax x RL 1276 3x Ctn x Bd 2x P.I. 174544	"
7921	Purdue 5912RB1-3-2	Rxt x RL 1276 2x Ajax x RL 1276 3x Ctn x Bd 2x P.I. 174544 4x Ctn 3x Ctn ^{2}x Ark 674 2x Mlf	"
7922	Purdue 5939B1-3-1	Rxt x RL 1276 2x Ajax x RL 1276 3x Ctn x Bd 2x P.I. 174544 4x Mlf 2x Ctn ^{2}x Ark 674 3x Cld 60 2x Cld ^{3}x LMHJA	"
7923	Tifton 916	Sg x LMHJA 4x Arl x Dlr 2x Tris 4x Wg	Georgia
7924	Tex. 57C1827	Fwn 2x Lee x Vtra 3x RR 4x Tra x Rld 5x Bd x Rb 2x Hj x Jt 3x Lh	Texas
7925	Coker's 62-26 (58-7)	Fg-3 x Sg 3x Vg 2x Bd x Flg 4x Sg	S. Carolina
7926	Coker's 62-41 (56-14)	Vg 48-93 x Sg	" "
7927	Coker's 62-42 (56-18)	Vg 4x Fwd 3x Arl x Dlr 2x Tris	" "
7928	Coker's 62-34 (58-6)	Wg x Sg 3x Vg ^{2}2x Bd x Fg 4x Sg	" "
7929	Belts. 61-124	Bl x LMHJA	USDA
7930	Delta 6172	LMHJA x Dlr	Mississippi
7931	Belts. 61-164	Bl x LMHJA	USDA
7932	Belts. 61-166	Bl x LMHJA	"
7933	Belts. 61-167	Bl x LMHJA	"
7934	Belts. 61-545	Bl x LMHJA	"
7935	Belts. 61-546	Bl x LMHJA	"
7936	Belts. 61-168	Reselection from Ballard	"
7937	Belts. 61-552	Mtg x Arl	"
7938	Belts. 61-555	Mtg x Arl	"
7939	Belts. 61-452	Wtk Sel. x HC 2x Arl	"
7940	Belts. 61-456	Wtk Sel. x HC 2x Arl	"

CI Number	Name or Designation	Pedigree	Origin and/ Source
7941	Belts. 61-574	Lec 2x Wtk Sel. x HC	USDA
7942	Belts. 61-341	Lec 2x Wtk Sel. x HC	"
7943	Belts. 61-342	Lec 2x Wtk Sel. x HC	"
7944	Belts. 61-344	Lec 2x Wtk Sel. x HC	"
7945	Belts. 61-472	RR 2x Vtra x Rld 3x Lee x Vtra 2x Fwn 4x Ctn ^{2}x SF	"
7946	Belts. 61-523	Bl 6x Lh x ^{4}Ctn 5x Osg 4x Bda 2x Hj x Jt 3x SF	"
7947	Avena sterilis L.		Greece

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*** Estimated Oat Disease Losses in the United States ***
1951-1960

by H. C. Murphy and J. P. Meiners (USDA)

Estimates of the average annual loss or damage caused by the different oat diseases during the period 1951-60, inclusive, were obtained from 23 states. These estimates were expressed as a percentage of the total production, if these diseases had been absent. Regional average losses were first obtained, based upon estimates available from the States in the region. Averages for the United States were then calculated using a weighting factor for each region, based upon relative grain production, as follows:

Region	No. States reporting	Weighting factor
North Central	8	83.7
Northeastern	3	6.0
Southeastern	9	5.9
Southwestern	1	2.6
Western	2	1.8
Total	23	100.0

The weighted average annual estimated losses or damage caused by oat diseases in the United States during the period 1951-60, inclusive, as a percentage of the total production if these diseases had been absent were as follows:

Rank	Disease	Percent loss
1	Barley yellow dwarf virus	3.8
2	Crown rust	3.7
3	Blast (sterility)	2.5
4	Root necrosis	2.4
5	Stem rust	2.2
6	Septoria avenae	1.7
7	Scab	0.9
8	Helminthosporium avenae	0.7
9	Smut	0.5
10	Soil-borne mosaic	0.4
11	Bacterial stripe blight	0.4
12	Helminthosporium victoriae	0.4
13	Blue dwarf virus	0.3
14	Halo blight	0.3
15	Helminthosporium clum rot	0.2
16	Physiologic leaf spot	0.1
17	Other diseases	0.1
	Total	20.6

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