ANNUAL REPORT OF COOPERATIVE REGIONAL PROJECTS
Supported by Allotments of the Regional Research Fund,
Hatch Act, as Amended August 11, 1955
January 1 to December 31, 1964

1. PROJECT: NORTH CENTRAL REGIONAL PROJECT NC-7

NC-7 "New Plants" - The Introduction, Multiplication, Preservation and Evaluation of New Plants for Industrial and Agricultural Utilization.

2. COOPERATING AGENCIES AND PRINCIPAL LEADERS:

State Experiment Stations	Representatives
Nebraska	*W. R. Kehr, Chairman
Alaska	*H. J. Hodgson
Illinois	*E. B. Patterson
Indiana	*K. J. Lessman
Iowa	*C. P. Wilsie
Kansas	*K. L. Anderson
Michigan	*C. M. Harrison
Minnesota	*L. C. Snyder
Missouri	*A. D. Hibbard
North Dakota	*G. A. Peterson
Ohio	*F. S. Howlett
South Dakota	*R. M. Peterson
Wisconsin	*W. H. Gabelman
Administrative Adviser	E. F. Frolik
U. S. Department of Agriculture	
New Crops Research Branch	*C. O. Erlanson, In Charge
Ass't. Chief, New Crops Research Branch	J. L. Creech
Plant Introduction Investigations	H. L. Hyland
Chemurgic Crop Investigations	G. A. White
Cooperative State Research Service	N. F. Farris
Soil Conservation Service	*D. S. Douglas
	M. D. Atkins
Northern Utilization Research & Development Division	*I. A. Wolff
U. S. Forest Service	*D. H. Dawson
North Central Regional Plant Introduction Station, Ames, Iowa	
Regional Coordinator	W. H. Skrdla
Horticulturist	A. F. Dodge
Plant Pathologist	

* Voting members of NC-7 Regional Technical Committee.

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS

a. Regional Station Program

(1) Physical facilities. For several years it was recognized that some means of dust removal was necessary to safeguard the health of employees during the process of seed threshing and cleaning. The NC-7 Technical Committee requested funds for this purpose and the funds were granted. As a result, we purchased two industrial size vacuum dust collectors, hoses and hoods. Our farm employees attached them to the sources of dust on the threshers and cleaners and made special hoods and modifications to effectively collect the dust. Each dust collector is of sufficient capacity to remove practically all the dust created by threshing and cleaning from the equipment to which it is attached. The collector filters the air and recirculates it back into the room. Thus, heat is retained in the room, which would be impossible if the air were exhausted outside the room. This equipment is a great asset to our operations because the employees no longer have to wear face masks or suffer from allergies.

A small tractor and cultivator attachments were purchased to replace the old roto-tiller which was nearly worn out.

(2) Production. The 1964 growing season is the seventeenth since the establishment of the regional station at Ames on December 1, 1947. The season can be considered one of extremes with respect to temperature and wind. Winds of 80 M.P.H. occurred on more than one occasion during the spring. July was extremely hot but August was exceptionally cool. Moisture was sporadic, in the early part of the season but since August was cool and wet, most crops came through quite well. Some may have been injured by the hot weather in July. There was very little snow cover during the winter of 1963-64, consequently, considerable winter killing and damage occurred in the plots.

The 1964 seed increases will result in an increase of about 880 items for the 1965 seed list. A comparison with 1963 is shown below:

Inventory of Available Crop Accessions

1963	1964-65	Increase
10,861	11,744	883

Table I. Number of Genera and Accessions of Various Crops Grown at the Regional Station in 1964.

	No. of Genera		No. of Accessions	
Crop	1963	1964	1963	1964
Grasses	23	25	475	552
Legumes	9	11	179	244
Vegetables	12	9	1236	1080
Ornamentals	50	7	175	28
Special Crops	34	33	235	267
TOTAL	128	85	2300	2171
Carryover of perennial accessions			305	400
TOTAL FOR SEASON			2605	2571

(3) Introductions received. There was a slight decrease in the number of crops received in 1964, compared with 1963. Again tomatoes account for the largest single crop received, 151 accessions.

Table II. Number of Genera and Accessions of the Various Crop Groups Received in 1963 and 1964. (See Appendix B).

Crop	No. of Genera ; 1963	1964	No. of Accessions 1963	1964
Grasses	43	13	89	184
Legumes	16	12	82	65
Vegetables	18	10	487	285
Oil & Special	34	3	41	25
Ornamental	26	20	41	40
TOTALS	137	58	740	599

(4) Seed and Plant Distributed by the Regional Station.

Table III. Number of seed packets and plants distributed in 1963 and 1964, according to crop group (See Appendix B for further details).

Crop	No. of Packets or Plants 1963	1964
Grasses	2856	1479
Legumes	1640	2773
Vegetables	4678	2978
Oil & Special	1089	967
TOTAL PACKETS	10,263	8,197
Ornamentals (Plants)	277	1,602
TOTAL, ALL ITEMS	10,540	9,799

Some of the largest single crops distributed are as follows:

Tomatoes	2206
Alfalfa	2169
Corn	680
Peas	464
Brassica	399
Sunflowers	383

(5) Total Seed and Plant Inventory for 1964. A detailed inventory of accessions on hand in 1964, appears in Appendix B. A summary of that inventory appears in Table IV.

Table IV. Summary of Appendix B.

Crop	No. Genera	Total Active 1/1/64	Removed From Inventory 1964	Received 1964	Total Active 12/31/64	Seed list 1964	To Be Increased	Packets, Plants Distributed
Grasses	45	3951	12	184	4123	3787	336	1479
Legumes	18	1802	13	65	1854	1669	185	2773
Vegetables	19	6424	48	285	6661	5616	1045	2978
Oil & Spec.	37	764	0	25	789	672	117	967
TOTALS	119	12,941	73	559	13,427	11,744	1683	8197
*Ornamentals	80	212	69	40	183	---	----	1602
TOTALS	199	13,153	142	599	13,610	11,744	1683	9799

*Woody and herbaceous ornamentals do not appear on the published seed list. A list of available stock is circulated to interested cooperators and orders are filled from their requests.

(6) Seed Transfers to the National Seed Storage Laboratory. Transfers of reserve quantities of seed of valuable introductions are being made to the National Seed Storage Laboratory. The following material was sent in 1964:

Alfalfa	481 accessions	
Tomatoes	423 accessions	
Sweetclover	1 accession	(var. 'Sangamon' from Illinois)
Redclover	1 accession	(var. 'Rahn' from Illinois)
TOTAL	906 Accessions	

Additional material is in the process of preparation for transfer in 1965.

(7) Plant Pathology Program. The work listed below was being accomplished in 1964.

(a) Screening corn accessions for resistance to Puccinia sorghi, Helminthosporium turcicum, H. maydis, Diplodia zeae, Fusarium stalk rot and P. polysora. Promising accessions were selected for further testing. Retesting was done by A. J. Ullstrup at Purdue University for resistance to H. turcicum and H. maydis. Additional retesting was done by D. C. Foley, Iowa State University.

(b) Screening of Cucurbita accessions for resistance to powdery mildew. Several wild species and cultivated accessions showed complete resistance to downy mildew, some to aphids, and some tolerance to spider mites. Parallel testings were made in the field and greenhouse. Data are incorporated into the 1963 seed list.

(c) Screening Cucumis accessions for resistance to powdery mildew was continued. Data appears in the 1963 seed list.

(d) Screening carrot introductions for resistance to nematodes, in cooperation with Iowa State University.

(e) As a cooperative venture among all four regional pathologists, a series of mimeographed reports has been initiated. The general title is "A Summary of Reports on the Resistance of Plant Introductions to Diseases, Insects, and Nematodes." Reports on crops which have already been published are:

1. Cucumis melo, by S-9
2. Brassica oleracea var. botrytis, by NE-9
3. Capsicum spp. by S-9
4. Cucumis sativus, by NC-7
5. Cucumis spp., by NC-7

(8) Woody Ornamental Program. With the participation of Alaska, this year for the first time all states of the region requested and received trees and shrubs for testing from the Regional Stations. Thirty-three (33) trial plantings were serviced.

(a) Plant Distribution. Seventeen items including 13 shrubs and 4 trees were available for cooperator regional trial planting. In addition, 2 trees and 4 shrub species were listed for replacement planting. Two cooperating nurserymen donated 11 different trees and shrubs. The North Platte Station, University of Nebraska, supplies plants of a chance Prunus seedling which had its origin at the U. S. Plant Introduction Station, Chico, California. In all 1602 plants including 269 replacements were shipped from the regional station to trial cooperators.

Two PI Buxus accessions, which had previously been growing at Ames, Iowa for a 10-year period, Euonymus fortunei 'Radicans Gracilis', the Mandan Honeylocust, and the Bradford ornamental pear were among trees and shrubs available to cooperators for trial planting.

(b) Regional Trial Performance Reports. During 1964 cooperators received three report forms for recording trial plant performance.

1. A new 10-year report form (RWPT-x) for trial plantings made in 1954.
2. The species-planting site 5-year report form. This for summarizing their observations on trees and shrubs which they requested and planted in 1959.
3. The new report of planting form for items which were received and planted in 1964.

Cooperator species-planting site 5-year reports were summarized for 5 trees and 5 shrubs regionally planted in 1958. The five year performance of three crab-apple clones suggested considerable differences in plant adaptation. From limited reports it is thought that Malus 'Liset', may prove to be successful over a greater portion of the Region than M. 'Van Eseltine'. The latter plant was not hardy in Northern Minnesota. The Veitchii crab did not grow satisfactorily in Southern Minnesota or Southern Wisconsin. This species has more promise for the southern half of the Region.

The reports for Pachystima canbyi, a low growing broadleaf, evergreen, planted in the 1956 regional trial, suggest that its usefullness is limited in shade or in competition with vigorous sod formers. This shrub has withstood full winter exposure to direct sunlight and wind without serious loss of foliage or foliage color. Plantings on a wide variety of soils, many of them alkaline, were regarded as successful.

(9) Public Relations. During 1964, the Regional Station was host to about 185 visitors. These were representatives from private interests, state and federal agencies, etc. About 70 members of the Iowa Seed Dealers Association toured the station during their meeting in Ames. About 85 agricultural and science teachers visited the station in two separate groups during their tour of Iowa State University. A class in horticulture of about 22 students conducted a "laboratory class", in which they became acquainted with the many kinds of plants at the station, as well as the station functions. The coordinator was interviewed about the station and its work on the Iowa State University radio "Farm Facts" program during the summer of 1964.

b. Regional Cooperative Program. Part a. of this report concerned the more specific activities carried on at the Regional Station. Part b. will concern primarily the regional cooperative activities.

(1) Domestic Exploration. Through financial assistance from the New Crops Research Branch, domestic exploration for plants in the North Central Region may be conducted through either of the following federal line projects:

CRi 1-11 Fruits and Vegetables
CRi 1-12 Field Crops
CRi 1-13 Specialty Crops

In 1964, domestic exploration was continued by the Nebraska Station in search of native plants that might be useful for ornamental use and for use on highway shoulders, slopes, etc. for erosion control as well as for appearance. Plants were collected in the states of Colorado, Wyoming, Nevada, Arizona, and New Mexico. Upon being collected, they are propagated and tested. Some will enter the NC-7 Regional tests, some sent to states having a common interest in the plants, and some, like Penstemons, are being tested through the American Penstemon Society. Obviously, the state of Nebraska is testing a large part of the collections, too. Approximately 500 items were collected in 1964.

(2) Evaluation of New Crops for Industrial Utilization. In 1964, the NC-7 project continued its participation in the evaluation and seed increase of new crops having possible industrial use as a source of oils, waxes, proteins, and fiber. This research and evaluation is cooperative among project leaders of several state experiment stations, the New Crops Research Branch, USDA - ARS - CR, the NC-7 regional project, and the Northern Utilization Laboratory at Peoria, Illinois. Certain crops are grown for observation at the Regional Station, but evaluations are primarily made by the cooperating state experiment stations.

(a) With assistance of funds privided through NC-7 seed contract agreements, seven states participated in the 1964 program. They are Indiana, Iowa, Minnesota, Missouri, Michigan, South Dakota and Alaska. The state of Nebraska also cooperates with NC-7 in this program.

(b) In 1964, Crambe, kenaf, Vernonia and several sorghums were further evaluated. The acreage of Crambe in the North Central Region continues to increase and there appears to be an increasing demand for seed, both for planting and processing purposes. Several commercial companies are now interested in this crop.

Limnanthes, another potential New Crop, cannot be successfully grown under cultivation in any presently known area of the United States. However, 1964 trials in Alaska continued to indicate that it is possible to obtain good yields there. Mechanical harvesting methods and weed control would have to be improved upon, but they are presently under consideration. It is possible that a large scale increase will be attempted there in 1965.

Attempts to produce Limnanthes in northern Michigan were promising at first, but in 1963 and 1964, the plots were wiped out by disease in mid-season.

(3) Regional Cooperative Evaluation Program.

(a) Evaluation and Research. The Regional Station coordinates evaluation and research information received from cooperators and disseminates it within the North Central Region as well as to the other three Regional Stations and cooperating federal agencies. The coordination of evaluation and research on plant introductions to (1) discover valuable characteristics in them and to (2) publicize the results to crops workers in the Region is a continuing function of the NC-7 program.

Introductions which are reported by cooperators to have special value or unusual characteristics are summarized in Appendix C of this report. Preliminary, as well as published results are reported.

(b) Federal Line Projects. Cooperative work is carried on with the New Crops Research Branch, USDA-ARS-CR, Soil Conservation Service, Northern Utilization Research and Development Division and Forest Service. Cooperative evaluation work with the New Crops Research Branch is conducted under the following line projects:

CRi 2-1 Evaluation and Maintenance of Fruit and Nut Introductions.
CRi 2-5 Evaluation and Maintenance of Vegetable Introductions.
CRi 2-7 Evaluation and Maintenance of Forage and Range Plant Introductions.
CRi 2-8 Evaluation and Maintenance of Cereal Crop Introductions.

(c) State Contributing Projects. In 1964, most states in the North Central Region continued cooperation with NC-7 through various contributing projects. Annual reports of progress on all these projects were submitted to the NC-7 Technical Committee in 1964 and are contained in Appendix D of the Minutes of the 1964 meeting of this committee. A complete list of projects is contained in Appendix A of this report.

A few of the significant reports made are:

1. The success of increasing Limnanthes in Alaska.
2. The relative resistance to root and crown rot of three Lotus corniculatus introductions, PI's 251146, 251827 and 251147, as reported by Missouri.
3. The relative resistance to leafhopper of selections from alfalfa introductions, 229955, 258817, 206278, 258758 and 270315, as reported by Nebraska. Also, leafhopper-resistant selections from 204889, 206278 and 243224 were used with 8 other Medicago sativa - type clones in the synthetic, N.S. 30. This synthetic continues to show a high level of resistance to leafhopper and clones with combined resistance to spotted alfalfa and pea aphids were selected from N.S. 30 and propagated for further observations.

c. "Pay-off" Introductions for 1964. On the basis of records kept on evaluation reports, it becomes evident that certain introductions have real merit due to disease or insect resistance, various other plant characteristics or for other reasons. A "pay-off" introduction is considered, at this station, as one for which its merit or value is sufficiently substantiated, used in breeding lines or in varieties, or otherwise generally accepted by crops workers.

Listed below are several introductions that may be considered as "pay-offs".

1. Zea mays

213713, a yellow dent variety, 'Mortgage Lifter', originally from Garden City Missouri and presented by W. L. Brown, Iowa. This line is considered to have resistance to Helminthosporium turcicum, as reported by A. L. Hooker, Illinois, Wm. Ambrose, Delaware, and J. Bryant, Illinois. It is considered to carry the dominant gene, Ht for resistance.

2. Cucumis sativus.

169400 Turkey. Carries resistance or tolerance to angular leafspot. J. C. Walker, Wisconsin reports that crosses were made with two breeding lines to incorporate resistance. Also, that resistance appears to be a multigenic factor, of a commercially valuable level.

3. Lycopersicon pimpinellifolium x L. esculentum.

180725 originally from Germany and is the result of a cross of the commercial variety 'Kondine Red' (PI 180723) with L. pimpinellifolium. This cross was made in Germany. Released by Oregon, with no appreciable change from the original, as the variety 'Large German Cherry'.

190256 New Caledonia. Used in the development of 'Summer Cherry' tomato by the Texas Agricultural Experiment Station. (See page 14 of Appendix C to this report for more details).

4. Coleus

249771 England, variety 'Beauty'. This accession was released in Missouri to the Florist trade in the fall of 1964 and has good customer acceptance. Leaves are moderately scalloped, a dark maroon center with wide margin of dark reddish-purple to purplish-red.

4. USEFULNESS OF FINDINGS:

Results obtained through the NC-7 cooperative project are mutually useful to plant breeders and other research workers. The NC-7 project represents cooperation among State Experiment Stations in the region, the USDA (including Crops Research Division, Soil Conservation Service, Forest Service and Northern Utilization Research and Development Division, private enterprise and the Regional Station. The evaluation of introductions and free exchange of information about them, as provided in this report and others, is beneficial to the workers themselves, and ultimately to the public, through release of new and improved varieties. The permanent maintenance of plant introductions also assures a future source of supply of known valuable lines and serves as a reservoir of diversified germplasm for screening whenever new characters are sought.

The regional evaluation work on promising industrial crops is contributing information on many species of plants, which is basic in the search for and development of new crops.

5. WORK PLANNED FOR NEXT YEAR:

Continue plant introduction program of seed increase, storage, preliminary evaluation, plant pathology work, regional testing of new crops and woody ornamentals, and coordination of regional cooperative program.

Regional cooperative work planned includes, but is not limited to the following:

a. Continue domestic exploration for native ornamentals.
b. Continue evaluation of grass, legume and vegetable introductions.
c. Continue evaluation of potential New Crops.
d. Send additional introductions to the National Seed Storage Laboratory for storage.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS PREPARED DURING THE YEAR:

a. Regional Station.

Informal as well as formal publications issued in 1964 are listed below:

(1) 1963 seed list of available introductions.

(2) Annual reports for NC-7 Technical Committee and the Cooperative State Research Service, including the summary of promising introductions.

(3) Dodge, A. F. 1964. Five year report on regional plants of woody ornamentals and shelter plants in the North Central Region, 1956 to 1962. Loose leaf notebook, North Central Regional Plant Introduction Station, Ames, Iowa. 20 pp., 10 maps.

(4) Dodge, A. F. 1964. Performance of three privet introductions in the upper midwest. Manuscript prepared for publication.

(5) Leppik, E. E. 1964. Some epiphytotic aspects of squash mosaic. Plant Disease Reporter 48:41-42.

(6) _____. 1964. Mapping of the world distribution of seed-borne pathogens. Proc. Intern. Seed Test. Assoc. 29:87-91, Wageningen, Holland.

(7) _____. A pathologists viewpoint on plant exploration and introduction. FAO Plant Introduction Newsletter No. 14, Dec. 1964, Rome, Italy.

(8) _____. and G. Sowell, Jr. 1964. Alternaria sesami, a seed-borne pathogen of world-wide distribution. FAO Plant Protection Bul. 12:31-16.

(9) Skrdla, W. H. The germplasm bank at Ames. Libby, McNeill and Libby, Contract Crops 3:8-12, Spring 1964.

b. Minnesota.

R. G. Robinson. Mustard and Oilseed Crops for Minnesota. Minnesota Agricultural Ext. Bul. 311:1-12. 1964.

c. Nebraska.

(1) L. C. Newell and E. C. Conard. Registration of Butte and Trailway Side Oats Grama. Crop Science 3:460-461. 1963.

(2) M. L. Schuster, D. P. Coyne, and Kamla Singh. Population Trends and Movement of Corynebacterium flaccumfaciens var. aurantiacum in Tolerant and Susceptible Beans. Pl. Dis. Rep. 48:823-827. 1964.

d. Ohio.

(1) Mithra G. Augustine, F. W. Fisk, R. H. Davidson, J. B. LaPidus, and R. W. Cleary. Host-Plant Selection by the Mexican Bean Beetle, Epilachna varivestis. Ann. of the Ent. Soc. of Amer. 57:127-134. 1964.

(2) Jules B. LaPidus, Robert W. Cleary, Ralph H. Davidson, Frank W. Fisk and Mithra G. Augustine. Chemical Factors Influencing Host Selection by the Mexican Bean Beetle, Epilachna varivestis Muls. Agric. and Food Chem. 11:462-463. 1963.

e. South Dakota.

W. S. Kingsley and D. W. Beatty. Crambe, Stranger on the Prairie. South Dakota Farm and Home Research 15:11-12. Summer 1964.

f. Cooperative Publication.

Crops Research Division, Northern Utilization and Development Division, ARS, USDA and Texas Agricultural Experiment Station:

M. L. Kinman and F. R. Earle. Agronomic Performance and Chemical Composition of the Seed of Sunflower Hybrids and Introduced Varieties. Crop Science 4:417-420. 1964.

7. APPROVED:

January 25, 1965
Date

W. R. Fehr
Chairman, Technical Committee

January 25, 1965
Date

E. F. Frolik
Regional Administrative Adviser

APPENDIX A

NC-7 STATE CONTRIBUTING PROJECTS, 1964-1965

1. Alaska: The Preservation, Multiplication and Evaluation of Indigenous Alaskan Rubus, Ribes, Vaccinium and Frageria. Initiated 7/1/60. Project 74.

2. Illinois: The Collection, Preservation and Extensive Evaluation of Trifolium, Lotus, Melilotus and Dactylis Introductions. Initiated 7/1/56; Terminated 6/30/64.

3. Indiana: Evaluation of Legume and Grass Introductions. Initiated 7/1/56. (Hatch 890)

4. Indiana: The Introduction and Testing of Adaptation of New Field Crops and Crop Varieties in Indiana. Initiated 7/1/63. Project 846.

5. Iowa: Agronomic Survey of Potential Industrial Oil and Fiber Crops for Culture in Iowa. Project 1556.

6. Kansas: Multiplication, Preservation, and Determination of Potential Value of Forage Grasses and Legumes. Initiated 7/1/49. Project 287.

7. Minnesota: Introduction, Preservation, and Evaluation of Stone Fruits of Probable Potential Value to the North Central Region. Project 2119R, Hort. 221. Initiated 7/1/50.

8. Minnesota: NC-7 Evaluation and Seed Increase of Crop Species Showing Promise for Industrial Utilization. Project 1317.

9. Missouri: The Evaluation of Introductions of Lotus corniculatus for Resistance to Root and Crown Rot. Initiated 7/1/60. Project 420.

10. Nebraska: Preservation of Alfalfa Clones and Seed Stocks needed in Alfalfa Improvement and Preliminary Evaluation of Plant Introductions. Initiated 7/1/49. Project 12-18 (Formerly 347).

11. Nebraska: The Introduction, Multiplication, Preservation and Determination of Potential Value of New Accessions and Strains of Native and Introduced Grasses. Initiated 7/1/49. Project 12-19 (Formerly 348).

12. Nebraska: Development of Crops for Industrial and Other Special Uses. Project 12-28.

13. Ohio: The Evaluation of the Collection of Domestic and Wild Species of Tomato and the Maintenance of Desirable Accessions and Valuable Breeding Stocks. Initiated 7/1/49. Project 72.

14. South Dakota: The Collecting, Preserving Cataloguing, Propagating, and Testing of Fruit Plants having Potential Genetic Value. Initiated 7/1/49. Project 174.

APPENDIX B

Inventory and Summary of Accessions Maintained and Received Through 1964.

Genera	Total Active Jan. 1 1964	Removed from Inventory 1964*	Received 1964	Total Active Dec. 31 1964	Seed List 1965	**To Be Increased	Packets Distributed.
GRASSES AND FIELD CROPS							
Aegilops	121	0	21	142	106	36	2
Agropyron	187	0	0	187	169	18	38
Agrostis	97	0	10	107	90	17	34
Alopecurus	34	0	0	34	31	3	19
Apera	5	0	1	6	5	1	1
Arrhenatherum	11	0	0	11	11	0	9
Bromus	392	1	8	399	377	22	14
Calamagrostis	10	0	0	10	9	1	1
Cynosurus	8	0	0	8	8	0	0
Dactylis	338	0	0	338	314	24	23
Danthonia	3	0	0	3	2	1	0
Echinochloa	16	0	7	23	16	7	2
Elymus	10	0	0	10	7	3	1
Eremopoa	2	0	0	2	2	0	0
#Eremopyrum	0	0	0	9	9	0	0
Euchlaena	3	0	0	3	2	1	4
Festuca	179	0	4	183	173	10	224
Guadiniopsis	1	0	0	1	0	1	0
Glyceria	5	0	0	5	0	5	0
Helictotrichon	4	0	0	4	3	1	0
Heteranthelium	3	0	0	3	3	0	0
Hordeum	8	0	0	8	7	1	1
Koeleria	7	0	0	7	6	1	0
Lolium	118	0	0	118	116	2	60
Nardus	2	0	0	2	0	2	0
Neurachne	1	0	0	1	0	1	0
Panicum	166	2	8	172	149	23	227
Pennisetum	1	0	1	2	1	1	0
Phacelurus	1	0	0	1	1	0	0
Phalaris	75	0	0	75	73	2	80
Phleum	47	0	0	47	44	3	3
Poa	49	0	0	49	49	0	30
Polypogon	2	0	0	2	1	1	0
Puccinellia	5	0	0	5	0	5	0
Schedonnardus	1	0	0	1	1	0	0
Secale	4	0	0	4	4	0	1
Setaria	97	0	9	106	91	15	2
Sorghum	16	0	5	21	16	5	21
Stipa	0	0	1	1	0	1	0
Tricholaena	2	0	0	2	2	0	0
Tridens	1	0	0	1	1	0	0
Tripsacum	1	0	0	1	1	0	0
Trisetum	4	0	0	4	3	1	0
Triticum	1	0	0	1	1	0	2
Zea--Introd.	1690	9	99	1780	1659	121	--
State O.P. Coll.	223	0	1	224	224	0	--
TOTAL ZEA	1913	9	100	2004	1883	121	680
TOTALS: Genera-45	3951	12	184	4123	3787	336	1479

Reidentified from Agropyron in 1964.
* Removed because of transfer to other regions, to Glenn Dale Storage or loss of seed due to inability to obtain increase and/or loss of viability.
**Does not include seed list items regrown for seed increase or maintenance of viability.

APPENDIX B

Genera	Total Active Jan. 1 1964	Removed from Inventory 1964*	Received 1964	Total Active Dec. 31 1964	Seed List 1965	**To be Increased	Packets Distributed.
LEGUMES							
Anthyllis	2	1	0	1	0	1	0
Astragalus	36	0	0	36	22	14	7
Coronilla	21	0	1	22	14	8	9
Dalea	4	0	0	4	2	2	1
#Dorycnium	0	0	1	1	0	1	0
Galega	0	0	1	1	0	1	0
Lathyrus	127	3	0	124	95	29	18
Lespedeza	19	0	4	23	18	5	1
Lotus	154	0	1	155	150	5	104
Medicago	614	2	27	639	592	47	2169
Melilotus	178	0	6	184	162	22	88
Onobrychis	47	0	0	47	47	0	31
Psoralea	12	0	2	14	8	6	1
Scorpiurus	16	0	4	20	15	5	0
Tetragonolobus	6	0	0	6	6	0	0
Trifolium	432	0	15	447	411	36	338
Trigonella	134	7	2	129	127	2	6
##Vicia	0	0	1	1	0	1	0
TOTALS: Genera-18	1802	13	65	1854	1669	185	2773
FRUITS & VEGETABLES							
Allium	349	10	4	343	189	154	70
Apium	49	0	0	49	49	0	0
Asparagus	53	0	0	53	17	36	0
Beta	294	0	4	298	286	12	3
Cucumis	463	5	7	465	442	23	57
Cucurbita	406	0	5	411	397	14	58
Daucus	283	4	17	296	188	108	19
Lactuca	276	8	0	268	227	41	25
Luffa	3	3	0	0	0	0	3
Lycopersicon	2650	2	151	2799	2360	439	2206
Petroselinum	0	0	88	88	0	88	71
Phaseolus	36	0	0	36	0	36	2
Pisum	1269	4	7	1272	1198	74	464
Prunus	1	1	1	1	0	1	0
Pyrus	2	0	0	2	0	2	0
Rheum	7	0	0	7	1	6	0
Rubus	82	0	0	82	82	0	0
Solanum	1	0	0	1	0	1	0
Spinacia	196	11	1	186	180	6	0
Vaccinium	4	0	0	4	0	4	0
TOTALS: Genera-19	6424	48	285	6661	5616	1045	2978

Reidentified from Lotus
##Reidentified from Lathyrus

APPENDIX B

Genera	Total Active Jan. 1 1964	Removed from Inventory 1964	Received 1964	Total Active Dec.31 1964	Seed List 1965	**To Be Increased	Packets Distributed.
OIL & SPECIAL							
Anethum	3	0	1	4	0	4	1
Brassica	371	0	0	371	342	29	399
Calendula	0	0	1	1	0	1	0
Camelina	2	0	0	2	2	0	0
Cassia	4	0	0	4	1	3	2
Cichorium	1	0	0	1	1	0	0
Chenopodium	1	0	0	1	0	1	0
Crambe	11	0	0	11	11	0	55
Crotalaria	1	0	0	1	1	0	5
Cyamopsis	5	0	0	5	0	5	0
Cynara	2	0	0	2	0	2	0
Dimorphotheca	1	0	0	1	0	1	1
Eruca	32	0	0	32	32	0	32
Euphorbia	2	0	0	2	2	0	2
Foeniculum	2	0	0	2	1	1	2
Guizotia	1	0	0	1	0	1	0
Helianthus annuus	249	0	23	272	244	28	383
Helianthus spp.	6	0	0	6	5	1	1
Hibiscus (Kenaf)	1	0	0	1	0	1	13
Lallemantia	2	0	0	2	0	2	2
Limnanthes	9	0	0	9	1	8	16
Lunaria	1	0	0	1	0	1	0
Mentha	11	0	0	11	7	4	12
Ononis	3	0	0	3	3	0	0
Osteospermum	1	0	0	1	0	1	0
Perilla	9	0	0	9	9	0	23
Raphanus	6	0	0	6	6	0	7
Ricinus	10	0	0	10	0	10	3
Rosa	1	0	0	1	1	0	0
Rudbeckia	1	0	0	1	0	1	1
Salvia	1	0	0	1	0	1	0
Satureja	5	0	0	5	1	4	0
Scabiosis	1	0	0	1	0	1	0
Sesamum	5	0	0	5	0	5	0
Sideritis	1	0	0	1	0	1	0
Spergula	0	0	0	0	0	0	0
Symphytum	1	0	0	1	1	0	0
Vernonia	1	0	0	1	1	0	7
TOTALS: Genera-37	764	0	25	789	672	117	967

APPENDIX B

ORNAMENTALS

Genera	Total Active Jan. 1 1964	Removed from Inventory 1964	Received 1964	Total Active Dec.31 1964	Use in Program	Plants Distributed - 1964
PI Abelia	1	0	0	1	H	0
Acanthopanax	1	0	0	1	H	0
Acer	1	0	0	1	H	0
Alnus	1	0	0	1	G	0
Amelanchier	1	0	0	1	G	0
Amorpha	1	0	1	2	G	0
PI Ardisia	1	0	0	1	G	0
PI Begonia	4	1	0	3	G	0
Berberis	1	0	0	1	H	0
Betula	2	0	0	2	G	0
PI Berchemia	1	0	0	1	G	0
PI Buxus	23	0	0	23	G	152
PI Camellia	1	0	0	1	G	0
Caragana	1	0	0	1	H	47
Caryopteris	1	0	0	1	H	76
PI Celastrus	1	0	0	1	G	0
Chrysanthemum	49	45	2	6	G	0
PI Coleus	23	0	0	23	H	0
Cornus	2	0	0	2	H	0
Corylus	1	0	0	1	H	33
PI Cotoneaster	3	2	4	5	PD	49
PI Damnacanthus	1	0	0	1	G	0
Deutzia	0	0	1	1	H	78
Dianthus	2	0	0	2	P	0
Dirca	0	0	1	1	G	0
Elaeagnus	1	0	0	1	P	0
Elsholtzia	1	0	0	1	H	0
Erigeron	1	0	0	1	G	0
Eucommia	1	0	0	1	H	0
Euonymus	4	0	2	6	GH	182
PI Euphorbia	1	0	0	1	H	0
Forsythia	1	0	0	1	H	0
Gleditsia	0	0	1	1	HD	77
PI Hedera	1	0	0	1	H	0
Hydrangea	2	0	0	2	GP	0
Hypericum	4	0	0	4	G	0
Ilex	10	6	0	4	G	0
Iris	1	0	0	1	G	0
Jamesia	1	0	0	1	G	0
PI Kohleria	1	0	0	1	G	0
Koelreuteria	0	0	1	1	D	33
Larix	2	2	0	0	0	0
PI Ligustrum	2	0	1	3	0	0
PI Lilium	1	1	0	0	0	0
PI Lippia	1	0	0	1	G	0
PI Liriope	1	0	0	1	G	0
Lonicera	5	0	0	5	G	0
PI Lycium	1	0	0	1	G	0

APPENDIX B

Genera	Total Active Jan. 1 1964	Removed from Inventory 1964	Received 1964	Total Active Dec.31 1964	Use in Program	Plants Distributed - 1964
Metasequoia	1	0	0	1	G	0
PI Morus	1	0	0	1	H	0
Pachystima	3	0	0	3	G	0
Passiflora	1	0	0	1	H	0
Penstemon	0	0	10	10	H	0
Perephyllum	1	0	0	1	G	0
Philadelphus	2	0	1	3	G	86
Photinia	1	1	0	0	-	-
Physocarpus	1	0	0	1	PG	0
Pinus	3	0	0	3	G	0
PI Potentilla	2	0	0	0	0	0
PI Prunus	0	0	2	2	HD	185
PI Pyricantha	1	0	1	2	G	0
Pyrus	2	1	1	2	HD	29
Quercus	1	0	0	1	G	0
PI Rhododendron	3	2	2	3	G	0
Ribes	1	1	0	0	0	0
Rosa	3	0	1	4	HG	0
Rubus	1	0	0	1	H	0
Salix	5	5	0	0	0	0
PI Salmia	1	0	0	1	G	0
PI Sambucus	1	0	0	1	G	0
PI Sarcandra	1	1	0	0	0	0
Scabiosa	1	0	0	1	G	0
Securinega	1	0	0	1	H	0
PI Shepherdia	2	0	1	3	G	0
Spiraea	2	1	0	1	H	0
Stephanandra	0	0	2	2	HD	140
PI Strobilanthes	1	0	0	1	G	0
Styrax	1	0	0	1	G	0
PI Syringa	1	0	5	6	HD	435
Thuja	1	0	0	1	H	0
TOTALS: Genera-80	212	69	40	181		1602

NORTH CENTRAL REGIONAL
PLANT INTRODUCTION STATION
Ames, Iowa

Appendix C to Project NC-7 Annual Report for 1964

PROMISING PLANT INTRODUCTIONS FOR 1964

Through the cooperation of crops workers who received and evaluated plant introductions from this station, we request and receive evaluation reports on materials tested. These reports are herein summarized. Information on lines showing interesting or promising characteristics, unusual characteristics, etc. is included.

Most of the results are preliminary in nature and should be considered as such. Whenever information from published material is reported, the complete reference to the publication is given.

Although many reports are preliminary in nature, crops workers are encouraged to use material reported upon or any other material which is listed and described in our seed lists published annually. One requisite for using this seed is that evaluation reports be submitted on the performance of the material used.

A. Cooperator Evaluations.

1. GRASSES

a. *Agropyron* spp.

Very winter hardy, being used in breeding program in an attempt to cross it with winter wheat.

229475 *A. intermedium* Iran
229917 *A. trichophorum* Iran
229918 *A. intermedium* Iran

- D. G. Wells, South Dakota

b. *Panicum miliaceum*

Selections made for further evaluation. Has superior color (white) to the common white variety, but smaller seed size. Common white yielded 4.2 bu/acre in 1964.

179387 Turkey Yielded 20.3 bu/A
179388 Turkey Yielded 15.2 bu/A

222811 Iran - Selections made for further evaluation. Has superior color (red) to the 'Turghai' check variety. Yielded 18.4 bu/A in 1964 compared with 5.6 for 'Turghai'

- G. Hinze, Colorado (W-6 Report)

The three introductions listed below were received in 1959. The seedling vigor, winter hardiness and response to nitrogen fertilization of these three introductions stimulated interest in further evaluation of all the available accessions of P. antidotale in the spring of 1964. Seed and vegetative material from the survivors of the 1959 planting are currently being evaluated along with the plant introductions received in 1964.

PI Number	Source	Emergence	Vigor	Stem Size	Leafiness	Culm Ht.	Seed Quantity	Disease Rating
204906	Turkey	G-Ex.	Good	Med.Coarse	Med.	6.7-7.2'	Med.	Fair
219609	Pakistan	G-Ex.	Good	Med.Coarse	Med.	6.7'	Med.	Fair
220026	Afghanistan	Good	Good	Med.Coarse	Med.	---	---	Fair

- W. H. Billings, Missouri

c. Setaria italica

Mean dry matter yields of certain Setaria introductions produced in 1964, compared with a check variety, are shown below:

PI	Source	Yield, lbs/A,D.M.
174289	Turkey	1440
223291	Afghanistan	1950
250025	Iran	1580
253497	Afghanistan	2030
255737	Turkey	1680
Cert. German	(check)	1070

- G. Hinze, Colorado (W-6 Report)

d. Sorghum bicolor

The introductions listed below are being used in a breeding program. They were crossed to a male sterile to form a broad germplasm base.

217708 Sudan	221617 Nigeria
217737 Sudan	221619 Nigeria
217760 Sudan	221633 Nigeria
217770 Sudan	221637 Nigeria
217781 Egyptian Sudan	221648 Nigeria
217855 Sudan	221649 Nigeria
217869 Sudan	221681 Nigeria
221574 Nigeria	277166 ----
221605 Nigeria	277168 ----
221606 Nigeria	285000 ----

- W. M. Ross, Kansas

The Sorghum introductions listed below have some reasonable degree of adaptation and potential. They are medium to short in height, medium to early maturity, were used as pollinator lines onto several male sterile lines (Martin, ms, and Kafir, ms, etc.). Hybrids produced will be selected and evaluated further in future years, discarding those that are not suitable.

APPENDIX C

221725 S. Africa	236286 Australia	267468 India
236277 Australia	236295 Australia	267469 India
236278 Australia	236297 Australia	267500 India
236282 Australia	253643 India	267501 India
236284 Australia	267389 India	267509 India

- R. E. Atkins, Iowa

e. Zea mays

The following accessions appear to have the single gene Ht for resistance to Helminthosporium turcicum.

162700 Argentina
198899 Argentina
213713 Missouri ('Mortgage Lifter')

- Wm. Ambrose, Delaware (NE-9 Report)

163558 Guatemala. Good roots, tall, high-eared white corn.

183814 Turkey. Early, has good roots

217413 Iowa 'Zapalote Chico'. Good tight husks.

The following accessions are segregating for resistance to H. turcicum:

213698 Indiana 'Reid's Yellow Dent'
213713 Missouri 'Mortgage Lifter'
221827 S. Africa 'Early King'
221845 S. Africa 'Homedale'
221866 Missouri 'Boone County White'
221871 Arkansas 'Delta Prolific White'
221876 Tennessee 'Jarvis Golden Prolific'
222609 Kansas 'Midland'

- J. Bryant, Illinois

Need further evaluation for possible resistance to stalk rot:

164381 India	210404 South Africa
172330 Australia	214186 Canada
172331 Australia	218167 New Mexico
186189 Uruguay	218178 Arizona 'Rainbow'
200185 Israel	279022 Spain

Expressed chlorotic lesions to H. turcicum similar to the resistance conditioned by the dominant gene Ht. On this basis it is listed as resistant to H. turcicum.

217461 Pennsylvania

- A. L. Hooker, Illinois

APPENDIX C

221866 Missouri 'Boone County White'. Selected plants were made in this accession and crossed with susceptible inbreds (A 498 and R53). Segregates resistant to H. turcicum were obtained from each of these crosses.

- A. L. Hooker, H. M. Hiler, D. R. Wilkinson, and C. G. Van Dyke. Additional Sources of Chlorotic-lesion Resistance to Helminthosporium turcicum in corn. Pl.Dis. Rep. 48:777-780. 1964.

The following accessions show promise for possible corn rootworm resistance:

165458 Mexico
167997 Turkey
168005 Turkey
218179 Arizona
218186 Arizona

- P. J. Fitzgerald, South Dakota

172331 Australia - Showed excellent stalk quality this year.

183730 Turkey - Shows some stalk quality and had semi-prolific tendencies in 1964.

185061 Turkey - Extremely early. Flowered 53 days after planting. Uniform.

186211 Peru - A very big-eared flint showing no prolific tendencies in 1964.

213731 Iowa 'Apache Red' - An early variety. Flowered 59 days after planting. Fairly uniform but extremely stalk rot susceptible.

257513 France - very early. Silked 59 days after planting and was in one-half pollen shedding stage 57 days after planting. Very uniform and possesses excellent stalk quality but is stalk rot susceptible.

- M. L. Peasley, Illinois

186225 Australia - Previously reported to be resistant to corn earworm. Resistance was found to be due to a very long husk. When husk is cut off prior to infesting with earworm larvae, or in seasons when the husk does not grow long, it becomes susceptible.

213798 North Dakota - Had good resistance to smut in both 1962 and 1963.

217413 Iowa ' Zapalote Chico'. Continued to show good resistance to corn earworm in 1963.

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218135 New Mexico - Had good resistance to smut in both 1962 and 1963.

- L. M. Josephson, Tennessee, 1964 S-9 Tech. Comm. Minutes

193424 Hungary - Appears promising as it is relatively early and has relatively good stalk strength.

200294 Yugoslavia - Poor seed set in 1964 but on the basis of one years' study it had relatively good stalk strength.

- A. Hallauer, Iowa

The following accessions were reported on in the publication listed below:

213713 Missouri 'Mortgage Lifter'. Resistance to H. turcicum is reported.

217407 Iowa 'Ladyfinger'. Dominant gene resistance Ht is decribed.

- A. L. Hooker, H. M. Hiler, D. R. Wilkinson & C. G. Van Dyke. Additional Sources of Chlorotic-lesion Resistance to Helminthosporium turcicum in corn. Pl. Dis. Rep. 48:777-780, 1964.

The following accessions are segregating for resistance to Puccinia sorghi:

226581 Ethiopia	252005 Turkey
226582 Ethiopia	253730 Brazil
226685 Guatemala	257608 Ethiopia
228181 Russia	257620 Ethiopia
230321 West Virginia	260614 Kenya
233330 South Africa	262473 Russia
239106 Yugoslavia	262474 Russia
239107 Yugoslavia	262479 Russia
239108 Yugoslavia	262481 Russia
239113 Yugoslavia	262484 USSR
239117 Yugoslavia	262486 USSR
239571 Turkey	262487 Russia
240320 Bolivia	262490 Russia
251883 Russia	262491 Russia
251886 Russia	262496 Russia
251887 Russia	262497 Russia

227938 Canary Island - Segregating for resistance to Puccinia polysora - necrotis flecks with minute pustules in their centers.

- A. J. Ullstrup, Indiana.

APPENDIX C

2. LEGUMES

a. Lotus corniculatus

In a test for root rot resistance, the introductions listed below showed much better persistence and less root rot than the group at large of 52 accessions tested. Survival rates for two accessions are given, which may be compared with the group survival of 26%. They are relatively vigorous and produced seed abundantly. They may have direct value as strains for release or indirect value as germplasm to add to the breeding program of recurrent selection.

251146	Yugoslavia	81% survival
251147	Yugoslavia	--- --------
251827	Italy	71% survival

- J. D. Baldridge, Missouri

b. Medicago spp.

141462 M. sativa Iran - continues to show good resistance to bacterial wilt and stem nematodes.

- Nevada report, 1963 W-6 Tech. Committee Minutes

Pea aphid resistant selections were made. Test and selection was based on seedling survival under extremely heavy infestation during cotyledonary stage.

PI No.	Species	Origin	No. of Selections Made
201864	M. aativa	Iran	1
206103	M. sativa	France	2
210367	M. sativa	Iran	1
211606	M. sativa	Afghanistan	2
211609	M. sativa	Afghanistan	5
211610	M. sativa	Afghanistan	4
217419	M. sativa	Denmark	5
219928	M. sativa	Afghanistan	2
220299	M. sativa	Afghanistan	5
220301	M. sativa	Afghanistan	4
220530	M. sativa	Afghanistan	1
220668	M. sativa	Afghanistan	3
220808	M. sativa	Afghanistan	2
221469	M. sativa	Afghanistan	2
222112	M. sativa	Afghanistan	1
222113	M. sativa	Afghanistan	1
222198	M. sativa	Afghanistan	1
237231	M. sativa	France	1
239954	M. sativa	Algeria	1
243224	M. sativa	Iran	1
246356	M. sativa	Germany	6

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PI No.	Species	Origin	No. of Selections Made
251205	M. falcata	Yugoslavia	2
251689	M. falcata	Russia	1
251830	M. falcata	Austria	5
258751	M. falcata	USSR	3
258752	M. falcata	USSR	1
258754	M. falcata	USSR	5
258830	M. sativa	USSR	1
260246	M. falcata	Germany	2
262532	M. falcata	USSR	4
262538	M. sativa	Morocco	3

- G. D. Moore, Minnesota

204889 M. sativa Turkey
206278 M. sativa Turkey
243224 M. sativa Iran

The first generation of N.S. 30 made from intercrossing eleven sativa-type clones which showed resistance to leafhopper yellowing for 2 years, 3 clones of which were selected from 204889, 206278, and 243224, showed a high level of resistance in 1962-64. The synthetic was advanced to the second generation, seeded in yield tests within the region in 1963, and showed a high level of resistance in 1964. Clones with combined resistance to spotted alfalfa and pea aphids were selected from N.S. 30 and propagated for field observations.

229955 M. sativa Iran
258817 M. sativa USSR

Selections from these accessions were intermediate in resistance to leafhopper in 1963-64.

206278 M. sativa Turkey
258758 M. sativa USSR
270315 M. tianschianica Sweden

Selections from these accessions were either intermediate or susceptible to leafhopper reaction in 1963-64.

- W. R. Kehr, Nebraska

211608 M. sativa - Afghanistan - More vigorous than Lahontan and good bacterial wilt resistance.

250935 M. sativa Iran. More vigorous than Lahontan but susceptible to Bacterial wilt.

255962 M. sativa ('Rambler)' Canada. Fair bacterial wilt resistance, less vigorous than Vernal.

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279958 M. sativa ('Kayseri') Turkey - Some resistance to stem nematodes but susceptible to spotted aphids.

- Nevada, 1963 W-6 Tech. Comm. Minutes

228152 M. falcata USSR - Highly resistant to rust.

233715 M. sativa Italy - Highly resistant to rust and has tolerance to leafhopper.

234818 M. falcata Switzerland - Some individual plants high resistant to rust.

237722 M. sativa Germany - Some individual plants highly resistant to rust.

231731 falcata-Iran.
~~237731~~ M. ~~sativa France~~ - Highly resistant to rust and has tolerance to leafhopper.

258751 M. falcata USSR - Shows resistance to rust, winter injury and leafhopper.

258754 M. falcata USSR - Shows resistance to rust, winter injury and leafhopper.

258758 M. sativa USSR - Some individual plants highly resistant to rust.

260246 M. falcata Germany - Shows resistance to rust and leafhopper.

262532 M. falcata USSR - Highly resistant to rust and has tolerance to leafhopper.

- E. L. Sorensen, Kansas

c. Melilotus spp.

172433 M. officinalis Turkey. Conspicuous for its extremely large tap root and branch root development - very leafy.

- L. J. Klebesadel, Alaska

208685 M. segetalis Algeria. (Some workers call it M. infesta). Shows resistance to attack by the sweetclover weevil. Was only 18% defoliated compared with 65% for 'Madrid' and 62% for 'Goldtop'.

- Radcliffe & Holdaway, Minnesota

d. Vigna sinensis

Show resistance to bean mosaic virus and are late maturing.

148681 Iran	Prostrate
152196 Paraguay	Erect
186360 Australia	Semi-erect

- S. Honma, Michigan

APPENDIX C

3. VEGETABLES

a. Allium cepa

Reaction of highly selected sample of A. cepa plant introductions to Pereonospora destructor and to two strains of Pyrenochaeta terrestris in the field.

PI No.	MR Seedstalks California	Pink Root Resistance Texas	Pink Root Resistance Oregon
249900	R*	R	S
249902	R	R	S
249903	R		Seg
255461	R		S
256324	R	R	S

* R-Resistant; S - Susceptible; Seg - Segregating

Please keep in mind that these Plant Introductions are not Homozygous for resistance to the two diseases, but that individuals within the introductions were found that had resistance to both diseases.

The following onion introductions showed resistance to pink root in Ontario, Oregon tests:

249902	R	255460	VR-I	264318	R	275626	R
249903	R	264113	I	274781	R		

R = Resistant; VR = Very Resistant; I = Immune

Tests made at Ontario Oregon.

- Elmo Davis, Beltsville, Maryland

294454 Great Britain
294455 Great Britain
294456 Great Britain

Contains genes for indehiscent anther and brown, round seed. However, it is present in only about 5% of the parents from which this seed was collected. May not be recovered just by growing a few plants.

- Through H. F. Winter, Beltsville,Md

275964 Greece
275965 Greece

Locally known in Greece as 'Velousiotika' or 'Nerokremmydo'. Bulbs sub-globose, red, sweet, sometimes weighing 1000 grams.

- Information received from donor.

b. Capsicum frutescens

159254 Georgia - Showed some tolerance to cucumber mosaic virus.

- S. Honma, Michigan

c. Cucumis sativus

In 1963 and 1964, all available cucumber introductions (about 430) were screened at Michigan State University by Dr. D. J. De Zeeuw for resistance to tobacco ringspot virus. Complete reports were made on all accessions tested each year. The second report will be distributed in January, 1965 but not necessarily to all who will receive this report (Appendix C to Annual Report). If copies of either one or both reports are desired, they may be obtained by writing to this station.

169400 Turkey - Had the lowest disease index of several introductions tested for angular leafspot resistance.

"In reciprocal crosses between 169400 and Wisconsin SMR 15 and Wisconsin SMR 18, respectively, the indexes for all F_1 progenies were similar and intermediate between those of the resistant and susceptible parents".

Resistance appears to be a multi-genic factor and is of a commercially valuable level.

- J. N. Chand and J. C. Walker. Inheritance of Resistance to Angular Leafspot of Cucumber. Phytopath. 54:51-53, 1964.

169400 Turkey - It was observed that when leaves inoculated with Angular leafspot, Pseudomonas lachrymus, on Wisconsin SMR 18 (susceptible), PI 169400 (resistant), and F_1 hybrids were compared, the multiplication of bacteria was greatest in the susceptible, least in the resistant and intermediate in the hybrid plants. The bacteria multiplied at equal rates in leaf extracts from susceptible and resistant plants.

- J. N. Chand and J. C. Walker. Relation of Age of Leaf and Varietal Resistance to Bacterial Multiplication in Cucumber Inoculated with Pseudomonas lachrymus. Phytopath. 54:49-50. 1964.

197087 India - Highly resistant to anthracnose, C. langenarium, but accession as a whole possesses a number of undesirable horticultural characters. After 4 generations of self-pollination (of resistant selections) and critical testing and selecting, the lines (designated S-4) were uniformly resistant. This means that genetic material with high resistance to anthracnose has been discovered and transferred to horticulturally desirable breeding lines of pickle-type cucumbers.

- M. J. Good. Arkansas Farm Research 13:6. July - Aug. 1964.

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265887 Netherlands. 'Improved Long Green' Possesses the non-bitter characteristic. Used in crosses with a more desirable fruit type to incorporate the non-bitter feature.

- J. Prend, Ohio

d. Cucurbita spp.

135394 C. pepo Afghanistan
169454 C. pepo Turkey
176536 C. pepo Turkey
265557 C. maxima Argentina
265561 C. maxima Iran

Resistant to squash mosaic virus.

- W. H. Sill, Kansas

143284 C. maxima. Iran - In greenhouse test, this line appears to be tolerant to powdery mildew.

165558 C. ~~pepo~~ maxima India - Resistant to powdery mildew in greenhouse tests - being used in genetic study for P.M. resistance.

- A. M. Rhodes, Illinois

e. Daucus carota

Tests were made to locate possible resistance to the storage disease organisms, Botrytis cinerea, Sclerotinia sclerotinorum and Rhizoctonia carotae. The roots were placed in storage for 5 months @ 33° and 85-95% R.H. The following accessions showed resistance:

178900 *No storage rots
193504 Slight storage rot development - looks like a commercial type.
193506 *No storage rot. Looks similar to commercial type but short and stubby.
205998 Very slight storage rot. Mixed root types, good internal color.
225868 *No storage rot. Internal color good.
232073 No storage rot. Medium internal color, rounded shoulder.
234623 No storage rot. Poor internal color.
263019 Medium to slight storage rot - good internal color.
277668 *No storage rot. Rounded shoulder.
277710 *No storage rot - Rounded shoulder medium color, green ring.
277711 *No storage rot - Rounded shoulder, medium light color green ring.

* Relatively small storage sample, therefore, absence of disease may not represent true resistance.

- A. D. Hoadley, Ohio

APPENDIX C

f. Lactuca spp.

The following 2 introductions have been found to exhibit unique differences in anatomical symptoms which will provide considerable insight into the understanding of this injury:

204706 L. sativa Turkey
211118 L. sativa Israel

- T. W. Tibbitts, Wisconsin

251245 L. sativa Egypt
251246 L. sativa Egypt

These two introductions are showing resistance to some form of lettuce mosaic, though the nature of resistance has not been determined.

261653 L. saligna Netherlands

Has mosaic resistance.

- 1963 W-6 Tech. Comm. Minutes

278109 L. sativa Turkey - Has no value under conditions at East Lansing. However, this accession had two off-type plants. These are boston type with a rose colored leaf margin. These were increased for distribution in the spring of 1965 and if anyone is interested, they will be released and named.

- D. Markarian, Michigan

g. Lycopersicon spp.

In 1964, 250 tomato introductions were evaluated at Missouri by Dr. V. N. Lambeth for the following fruit quality characteristics:

pH
Titratable acidity
Titratable acidity expressed as % citric acid equivalent
Total soluble solids (% Brix)
Sugar/acid ratios

Also, cross sectional photographs, both black and white and color, were made of representative fruit samples. Both wild and cultivated types were evaluated.

Appendix C

Self fertile selections made from curly top resistant plants from the introductions listed below:

126431 L. peruvianum Peru
126443 L. glandulosum Peru
126448 L. glandulosum Peru
126926 L. peruvianum-dentatum Peru
126928 L. peruvianum Peru
126930 L. peruvianum-dentatum Peru
126929 L. peruvianum Peru
126935 L. peruvianum-dentatum Peru
126944 L. peruvianum Peru
126945 L. peruvianum Peru
126946 L. peruvianum Peru
127830 L. peruvianum-dentatum Peru

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High germinating lines at 50° F.

95588 L. esculentum Manchuria
105342 L. esculentum China
120256 L. esculentum Turkey
174261 L. esculentum Turkey
203229 L. esculentum Australia
237137 L. esculentum Italy
255847 L. esculentum Italy
263713 L. esculentum Puerto Rico

Number of days from field setting to the first marketable fruit:

112835	L. esculentum x pimpinellifolium	Guatemala	63	Indeterminate
126437	L. esculentum x pimpinellifolium	Peru	63	Indeterminate
118406	L. esculentum	Venezuela	65	Determinate
193403	L. esculentum	Ohio	75	Dwarf vine
264548	L. esculentum	Chile	75	Indeterminate
273444	L. esculentum	Oklahoma	75	Indeterminate
275014	L. esculentum	Bulgaria	75	Determinate
255842	L. esculentum	Italy	80	Indeterminate
270409	L. esculentum	Mexico	80	Indeterminate
193399	L. esculentum	Ohio	85	Dwarf
272219	L. esc. x pimp. x peruvianum	Italy	85	Indeterminate

- 1964 NE-9 Tech. Comm. Minutes

The following accessions carry resistance to the cotton root-knot nematode, Meloidogyne incognita acrita:

126928 L. peruvianum Peru
126929 L. peruvianum Peru
126944 L. peruvianum Peru
128657 L. peruvianum Peru

- G. Sowell, S-9 Reg. Plant Introduction Station

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126936 L. hirsutum Peru - contributed to the development of a new variety of dwarf tomatoes resistant to curly top. Released under the name of 'Payette'.

- 1963 W-6 Tech. Comm. Minutes

127805 L. pimpinellifolium Peru - A selection was made for resistance to bacterial wilt and carried through 9 generations until apparently true breeding for this characteristic. It was then used as a resistant parent in the study of resistance to this disease. A simple inheritance pattern for resistance bacterial wilt was not observed and resistance has not as yet been broken by emergence of adapted strains of the bacteria.

- 1963 W-6 Tech. Comm. Minutes

180725 L. pimpinellifolium x L. esculentum Germany - Released as variety 'Large German Cherry' in Oregon. It is not believed that this line varies in any appreciable degree from the original material received.

- W-6 Report

190256 L. esculentum x L. pimpinellifolium New Caledonia - Used in the development of 'Summer Cherry' tomato by the Texas AES. Summer Cherry tomato (STEP 437 and S1447E) was developed by crossing S1119 summer tomato with a wild cherry tomato, PI 190256 from New Caledonia at the Tomato Laboratory at Jacksonville, Texas in 1950. Selections were made to fix the type of the large prolific plants with uniform ripening fruit. The new variety produces high yields of the one inch spherical fruit, much in demand at the present. The pedicels usually remain attached to the fruit when they are picked. It sets well in very warm weather. The new variety resists cracking, puffing, catfacing and blossom end rot of fruits.

- Texas AES Leaflet L-609
September 1963.

213189 L. esculentum Greece - Being used in a breeding program. The plant has short internodes, small, firm fruit, and is exceedingly prolific over a long period of time for a determinate type.

262934 L. esculentum USSR - Being used in a greenhouse tomato breeding program in an effort to transfer the short internode character to a greenhouse variety.

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Selections made from the following accessions for characteristics adapted to mechanical harvesting.

262932 - L. esculentum USSR. Tiny, dwarf, good fruit set and type, very early.

280596 - L. esculentum USSR. Small dwarf, good set of small very good type fruit, very early.

280597 - L. esculentum USSR. Small plant, very good set of small plum type fruit.

280600 - L. esculentum USSR. Dwarf, good set of medium sized, very good type fruit. Very early.

280601 - L. esculentum USSR. Small plant, good set of medium sized, very good type fruit.

283904 - L. esculentum USSR. Small dwarf, very good set of medium size good type fruit.

283952 - L. esculentum Czechoslovakia. Small plant, good set of very good type small fruit, uniform ripening.

285132 - L. esculentum Oklahoma. Small plant, good set of medium sized plum type fruit.

- M. W. Martin (W-6 Report)

263726 - L. esculentum Puerto Rico. Of value for its firmness and setting fruit under high temperatures, but too late for Indiana. Needs further evaluation.

273447 - L. esculentum USSR. Has value for its earliness, crack resistance and prolific set.

280590 - L. esculentum USSR. Has value for its earliness, crack resistance and dwarf vine but the fruit is too small.

280591 - L. esculentum USSR. Has leafy inflorescence characteristic, fruit matures too late.

280595 - L. esculentum USSR. Of value for its firmness and setting fruit under high temperature. Good fruit set and fair foliage cover. Needs further evaluation.

280596 - L. esculentum USSR. Of value for its firmness and setting fruit under high temperatures. Has dwarf vine, early maturing, prolific fruit set. Needs further evaluation.

280597 - L. esculentum USSR. Shows crack resistance and prolific fruit set.

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280598 - L. esculentum USSR. Of value for its firmness and setting fruit under high temperatures. Exhibits some crack resistance and good fruit set but the fruit is too flat and small. Needs further evaluation.

280599 - L. esculentum USSR. Has good crack resistance, dwarf vine type.

- R. J. Barman, Indiana

280669 - L. esculentum USSR. Moderately resistant to bacterial black spot, Xanthomonas vesicatoria.

280670 - L. esculentum USSR. A hybrid, moderately resistant to bacterial blackspot.

280671 - L. esculentum USSR. A hybrid, moderately resistant to bacterial blackspot.

280672 - L. esculentum USSR. A hybrid, moderately resistant to bacterial blackspot.

- Information received from USSR with the seed shipment.

h. Malus spp.

137577 - M. robusta #5 'Cherry Crab' Canada. Promising framework stock for apple.

~~250299~~ 220539 M. sylvestris Afghanistan. Has possible ornamental value - disease resistant.

- A. D. Hibbard, Missouri

i. Phaseolus spp.

165078 P. vulgaris Turkey. The only accession out of about 1600 tested that had good resistance to common blight, Corynebacterium flaccumfaciens var. aurantiacum. Resistance holds up very well under high heat and other extreme conditions.

- M. L. Schuster, D.P. Coyne and Kamla Singh. Population Trends and Movement of Corynebacterium flaccumfaciens var. aurantiacum in Tolerant and Susceptible Beans. Pl. Dis. Rep. 48:823-827. 1964.

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The following introductions are resistant to halo blight but susceptible to brown spot:

174907 P. mungo India
212615 P. mungo Afghanistan
213014 P. aconitifolius India
214332 P. aconitifolius India
221974 P. angularis Japan
222202 P. vulgaris Afghanistan
268414 P. vulgaris Afghanistan

224732 P. vulgaris Mexico. Resistant to race 1 but susceptible to race 2 of halo blight. Susceptible to brown spot.

- P. N. Patel, Wisconsin

174907 P. mungo India. Used as a Mexican Bean Beetle - resistant line in experiments showing that non-reducing sugars are significantly higher in seeds of non-resistant plants. Results are published in the following publications:

(1) Mithra G. Augustine, F. W. Fisk, R. W. Cleary. Host Plant Selection by the Mexican Bean Beetle, Epilachna varvestis. Annals of the Ent. Soc. of Amer. 57:127-134. 1964.

(2) J. B. LaPidus, R. W. Cleary, R. H. Davidson, F. W. Fisk, and M. G. Augustine. Chemical Factors Influencing Host Selection by the Mexican Bean Beetle, Epilachna varvestis Muls. Agric. and Food Chem. 11:462-463. Nov/Dec., 1963.

- R. W. Davidson, Ohio

j. Pisum sativum

140295 Iran. Line G168 is a pea enation mosaic virus - resistant selection made at the Geneva Agricultural Experiment Station, New York. It was used in developing line V-113 along with another breeding line, G51 and the varieties 'Creole' and 'Pride'. V-113 is a mid-season (13-14 nodes to flower) freezer pea resistant to pea enation mosaic (PEMV), Pea Mosaic (BV_2 = BYMV, PV_2, PV_3), and wilt (Fusarium oxysporum f. pisi). It is characterized by good pod fill and productivity, but the berry color may be too light for commercial acceptance. It is being released primarily as a useful parent in crosses.

- Improved Germplasm for Pea Breeders. Res. Cir. Series No. 1, Oct. 1963, Dept. of Veg. Crops and Plant Pathology, New York AES, Geneva.

236493 Sweden. Multiple bloom, Mid-season, tight pods, heavy branch, poor taste (starchy). Set is best feature.

244114 Holland. Multiple bloom.

- I. J. Jorgensen, Minnesota

4. SPECIAL CROPS

a. Carthamus tinctorius

The following accessions show promise for their early flowering and maturity under South Dakota conditions:

197832	India	248626	West Pakistan
198290	India	248858	India
198292	India	248860	India
199921	India	248867	India
237545	Sudan	248868	India
237551	Morocco	250186	West Pakistan
248331	India	250188	West Pakistan
248355	India	250191	West Pakistan
248369	India	250524	Egypt
248383	India	253537	Portugal
248625	West Pakistan	253560	Portugal

- H. A. Giese, South Dakota

b. Coleus

249770 'Autumn' England. Has possible retail value in Missouri.

249771 'Beauty' England. Released in Missouri to the florist trade in the fall of 1964 and has good customer acceptance (moderately scalloped, center dark maroon with wide margin of dark reddish-purple to purplish-red)

249791 'Pagasus' England. Has possible retail value in Missouri.

- S. Hardinger, Missouri

c. Helianthus annuus

10 USSR introductions were tested at 8 locations in comparison to standard U. S. hybrids for yield, oil content and composition, etc. Russian varieties showed more variability in yield and other plant characteristics but were consistently higher in oil content. Linoleic acid oil was predominant, showed an inverse relationship with oleic acid content, could be calculated from iodine value ($r=0.991$) and its content in the seed was a function of location where grown. Reduced temperatures during development resulted in increased linoleic and reduced oleic acid content of the oil.

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265099 - VNIIMK No. 16.46 (Also received as 257642, 287183 and 262516)

265100 - Jdanovsky 82.81 Late maturing

265101 - Armavirsk 93.43

265102 - Armavirsk 93.45

265103 - VNIIMK 88.83 (Also received as 291411)

265104 - Tchernianka No. 66 Very early maturing.

257640 - Tchernianka No. 11 (Also 257641 and 265500)

257641 - Chernianka No. 11 (Same as 257640)

257642 - Same as 265099

262516 - Same as 265099

- M. L. Kinman and F. R. Earle. Agronomic performance and Chemical Composition of the Seed of sunflower hybrids and introduced varieties. Crop Science 4:417-420. 1964.

Coordinator Note: Dr. Kinman points out that VNIIMK 16.46 was introduced, increased and tested under three (3) different PI numbers. When these high oil lines were first introduced, little attention was given to variety names. However, later we began to receive the same varieties from other countries and there was no alternative but to carry them as separate lines. However, we are now giving more attention to variety names and will attempt to keep sunflower breeders informed of variety names, especially those of Russian origin.

174220 Turkey. Good vigor, moderately early, satisfactory stem strength but low in oil content.

201815 H. macrophyllus x H. tuberosus Sweden. Extremely late blooming but of interest because of potential disease resistance. Attempts will be made to cross with cultivated type.

201816 H. macrophyllus x H. tuberosus, Sweden. Extremely late blooming but of interest because of potential disease resistance. Attempts will be made to cross with cultivated type.

257643 'VNIIMK 35.19' USSR. Promising oil content - 35.0 to 37.9%

262517 'VNIIMK 89.31' USSR. Promising oil content 35.0 to 37.9%

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262518 Israel. Promising oil content 35.0 to 37.9%

274517 H. tuberosus x H. annuus. USSR. Extremely late blooming but of interest because of potential disease resistance. Attempts will be made to cross with cultivated type.

274518 H. tuberosus x H. annuus x H. macrophyllus. USSR. Extremely late blooming but of interest because of potential disease resistance. Attempts will be made to cross with cultivated type.

- E. D. Putt, Canada

The following accessions are tall, vigorous and retained sufficient leaves to provide shade for turkeys through August, but were not superior to the commercial variety, 'Graystripe'.

171657 Turkey
219650 Austria
232906 Hungary
250852 Iran
251993 Turkey
265499 Colombia

- K. L. Athow, Indiana

181881 Syria. Plants seemed quite self-sterile.

192943 Chine - Some rust resistance.

251466 Turkey. Some plants looked quite rust resistant.

251901 'Jdanovsky 64.32' USSR. Plants almost completely rust-free.

262515 Israel. Weak stems.

- R. W. Taylor, Minnesota

Flowers are quite ornamental and held up well in a container for almost one (1) week. Plants also make a good screen when used for landscape purposes. Susceptible to mildew in late season and also to stem borer. Tubers are edible and may be used in salads or in the same way as radishes or celery.

201815 H. macrophyllus x H. tuberosus. Sweden
274517 H. tuberosus x H. annuus. USSR
274518 H. tuberosus x H. annuus x H. macrophyllus. USSR

- R. A. Keen, Kansas

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Accessions listed below were noted to have rust resistance:

257640 H. annuus USSR
262516 H. annuus USSR
'VNIIMK 16.46'
265100 H. annuus USSR
'Jdanovsky 82.81'
265101 H. annuus USSR
'Armavirsk 93.43'
265103 H. annuus USSR
'VNIIMK 88.83'

265104 H. annuus 'Tchernianka No. 66' USSR. The short stature of this accession may make it useful for combine purposes.

- Montana report, 1963 W-6
Tech. Comm. Minutes

d. Symphytum peregrinum

233329 Canada. In east central Nebraska on dry land but good soil, one cutting in 1962 yielded 3½ T/A (dry). In 1963, 2 cuttings yielded 8.2 T/A. Bristly nature of plant is not desirable. Recommend use as a processed feed, silage, pellets, etc. Crushing did not overcome the difficulty of drying the stem.

- M. A. Kosch, Nebraska