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, 1962

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
Michigan	*C. M. Harrison, Chairman
Alaska	*C. E. Logsdon
Illinois	*E. B. Patterson
Indiana	*R. C. Pickett
Iowa	*C. P. Wilsie
Kansas	*R. V. Olson
Minnesota	*A. N. Wilcox
Missouri	*A. D. Hibbard
Nebraska	*W. R. Kehr
North Dakota	*G. A. Peterson
Ohio	*F. S. Howlett
South Dakota	*S. A. McCrory
Wisconsin	*W. H. Gabelman
Administrative Adviser	E. F. Frolik
U. S. Department of Agriculture	
New Crops Research Branch	*C. O. Erlanson, In Charge
Crop Breeding Stock Investigations	W. E. Whitehouse
Plant Introduction Investigations	H. L. Hyland
Chemurgic Crop Investigations	J. R. Haun
Cooperative State Experiment Station Service	N. F. Farris
Soil Conservation Service	*A. D. Stoesz
	D. S. Douglas
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	E. E. Leppik

* Voting members of NC-7 Regional Technical Committee

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS

a. Regional Station Program

(1) Physical facilities - In 1962, a 5-acre tract of land (called the garden area) formerly used by the Regional Station had to be relinquished. To compensate, the Iowa Agricultural Experiment Station made available additional land area adjacent to the regional station farm headquarters. A total of about 12 acres to the west and south of the station farm is now available. Much good usable land is in this area and it has the important advantage of being near the center of station operations.

Construction of the greenhouse addition was begun in late 1962. Due to cold weather, in mid-winter, work had to be interrupted until spring.

The refrigerated room in the cave storage required renovation because the wooden framework deteriorated and had to be removed.

(2) Production - The year 1962 was the fifteenth crop year since the establishment of the North Central Regional Station. In general, the season was favorable and the total moisture received was good. The summer was relatively cool. Severe storms, including high winds, heavy rain, numerous hail storms with very large stones quite well characterizes the spring weather. Consequently, the early spring crops were damaged, peas being perhaps the most affected and only the most sturdy and vigorous lines recovered sufficiently well to produce a reasonable seed increase. Frequent intermittent showers in mid-summer, together with cool temperatures, created a severe weed problem. Winterkilling was not too severe as we had a good snow cover during most of the extremely cold weather.

Our 1962 seed increases will result in a net increase of 558 new items for the 1962 seed list of available items. A comparison with 1961 is shown as follows:

Inventory of available crop accessions

1961	1962	Increase
9802	10,360	558

Table I. Number of genera and accessions of various crops grown at the Regional Station in 1962.

Crop	No. of genera		No. of accessions	
	1961	1962	1961	1962
Grasses	37	30	562	365
Legumes	15	14	389	157
Vegetables	10	11	1065	1157
Oil & Special	23	29	536	327
Ornamental	15	65	80	185
TOTAL	100	149	2632	2191
Carryover of perennial accessions			750	485
TOTAL FOR SEASON			3382	2676

The decrease in number of perennial accessions grown in 1962 is partly due to less available operations funds. An allocation of a portion of the station funds for 1961-62 was made for the greenhouse addition.

(3) Introductions received - There was a marked decrease in the total number of introductions received in 1962 compared with 1961 as shown in Table II. Vegetable crops were largely responsible for this decrease as there were no large collections received in 1962 as in 1961. Other crops remained about the same.

Table II. Number of genera and accessions of the various crop groups received in 1961 and 1962.

Crop	No. of genera		No. of accessions	
	1961	1962	1961	1962
Grasses	13	12	93	66
Legumes	6	7	67	72
Vegetables	12	11	1054	247
Oil & Special	3	6	25	26
Ornamental	-	10	-	37
TOTALS	34	46	1239	448

(4) Seed distributed by the Regional Station

Table III. Number of seed packets and other items distributed in 1961 and 1962 by the Regional Station, according to crop group (See Appendix B for further details).

Crop	No. of packets or items	
	1961	1962
Grasses	4093	5015
Legumes	1138	1521
Vegetables	10,965	4846
Oil & Special	1164	597
TOTAL PACKETS	17,360	11,979
Ornamental (Plants)	767	629
TOTAL, all items	18,127	12,608

There was an increase in use of grass and legume introductions in 1962. Corn still accounts for a very high percentage of grasses with 3600 out of 5015 packets distributed. Brome is next at 260 packets, followed by Panicum, 213 packets.

Medicago accounts for about half of the legumes distributed, 766 packets being distributed. Lotus is next at 244 and Trifolium third at 209 packets.

There were slightly more packets of Pisum distributed in 1962 than Lycopersicon. A total of 2230 packets of peas, 1885 tomatoes, 205 cucumbers and 150 beets were distributed.

With regard to special crops, there continues to be considerable interest in sunflower introductions and other oil crops. Of 597 packets of oil crops distributed, 395 were sunflowers, 83 Brassica and 31 Eruca.

(5) Total seed and plant inventory for 1962 - A detailed inventory of accessions on hand in 1962, showing active and inactive items, available items, material distributed appears in Appendix B. A summary of that inventory appears in Table IV.

Table IV. Summary of Appendix B.

Crop	No. Genera	1961 total cumulative	Removed from inventory 1962	Received 1962	1962 Net cumulative	Seed List 1962	To be increased	Packets, Plants Distributed
Grasses	46	3835	26	66	3875	3617	258	5015
Legumes	16	1653	15	72	1710	1532	178	1521
Vegetables	18	5827	115	250	5962	4601	1361	4846
Oil & Special	35	691	1	28	718	609	109	597
TOTALS	115	12,006	157	416	12,265	10,359	1906	11,979
Ornamentals*	65	183	35	42	190	-	-	629
TOTALS	180	12,189	192	458	12,455	10,359	1906	12,608

* 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 Laboratory. In 1962, over 300 lines of open pollinated corn varieties and unnamed lines were transferred. In cooperation with the National Alfalfa Committee and the Central Alfalfa Improvement Committee, we plan to transfer seed of proven and unproven lines of alfalfa introductions.

Under this program, the Regional Station continues to maintain an active supply of seed stocks of all introductions on hand. Only the "excess" or "reserve" seed, which can be spared without affecting distribution, is transferred. Accessions for which seed cannot be spared must be re-increased before the transfer is made.

(7) Plant Pathology program -

(a) Field observations and evaluation of all material planted in fields and greenhouses. This was and still is the first and most important source of information for current seed lists. The reaction of introduced plants to common diseases was evaluated and the degree of their resistance to definite diseases rated systematically throughout the growing season. A total of 2315 accessions of field plants and 560 accessions in greenhouses were evaluated, most of them 3 to 5 times during the growing season. Many promising accessions as prospective sources of resistance were detected and will be subjected to further study and testing. Results of field observations were compared with inoculation tests and both ratings were incorporated into the Seed List 1962.

(b) Inspection of all introductions concerning foreign pathogens and pests. In addition to many previous detections following foreign diseases were intercepted during the year 1962.

1) Sorosporium sp., probably S. manchuricam Ito (identification is not yet completed), a destructive smut imported by seed from Afghanistan on a Panicum sp. (P.I. 268411). This accession was so heavily infected that it seemed reasonable to destroy the whole material. No effort was made to produce disease-free seed out of this accession.

2) A mosaic on Lycopersicon esculentum. Seed collected from El Salvador, Central America. (P.I. 272833). Infected plants were detected in greenhouse and isolated before the disease could spread by insects. Disease-free seed was propagated and is available for distribution.

3) Chlorotic spots on Solanum pennellii Correll seed introduced from Peru (P.I. 246502). Infected plants were isolated in the greenhouse. Disease-free seed is available.

4) Plasmopara halstedii was detected on Dimorphotheca aurantiaca as a damaging pathogen able to cause serious epiphytotics. Dimorphotheca is a new host genus for this pathogen.

Other seed-borne diseases, so far detected at Regional Plant Introduction Station, Ames, are reported and photographed in North Central Reg. Plant Introduction Station Disease Report No. 7, Seed-borne diseases on Introduced Plants, 1962.

(c) Eradication of squash mosaic. A heavy outbreak of squash mosaic in Ames, on squash and pumpkins was traced back to certain accessions. Cucumber beetles began to spread the pathogen and it appeared that all increase seed might become infected. A special effort was, therefore, initiated to eradicate this pathogen. After several years of intensive work all sources of infection could be detected and exterminated so that the seed distributed from the N. Central Regional Station is now free from squash mosaic. This helped to avoid the distribution of a dangerous disease in N. Central Region through P. I. material.

(d) Screening of corn accessions and inoculation experiments with Helminthosporium turcicum, Puccinia sorghi and Diplodia zeae was continued, as follows:

1960 - 632 accessions inoculated
1961 - 566 accessions inoculated
1962 - 607 accessions inoculated

Twenty-three accessions showed relative resistance to rust, 6 to leaf spot and 2 to stalk rot. These prospective introductions are subject to further study. The project is to be continued.

(e) Production of fenugreek seed, Trigonella foenum graecum, free from Cercospora traversiana was continued in isolated greenhouse. Disease-free seed was obtained from 64 accessions and is available for distribution. By this work a dangerous foreign pathogen, which has already entered the United States, is intercepted and eradicated before it becomes generally distributed. Nevertheless actual danger exists in that this pathogen may re-enter by any seed sample imported from its native area of distribution. An inspection and screening of new fenugreek introductions is, therefore, to be continued.

(f) Production of disease-free seed of Lathyrus accessions introduced from Ethiopia and other countries of the Near East was continued in the greenhouse and in the field. During the winter, disease-free seed from 51 accessions was produced in the greenhouse for field plantings. This project prevented the distribution of a new epiphytotic race of Ascochyta pisi imported by seed from Ethiopia and neighboring countries of the Near East. The screening of previously introduced Lathyrus accessions will be finished during the current year but the screening of newly introduced material has to be continued.

(g) Testing all sunflower accessions for presence of a new race of downy mildew, Plasmopara halstedii detected in many seed samples introduced from Russia and neighboring countries. This program elinimated the distribution of a new and dangerous race of downy mildew of sunflowers.

(h) Screening of Cucurbita accessions for resistance to powdery mildew. Several accessions showed relative resistance to this disease in the field and greenhouse inoculations.

(i) Screening of Cucumis accessions for resistance to powdery mildew. Several accessions showed resistance and are subjected to further study and testing.

(j) Observation of alfalfa accessions for resistance to rust, Uromyces striatus. These observations were made possible after an exceptionally heavy epiphytotic outbreak of alfalfa rust in the fall of 1962 at Ames. Field screening and inoculations in greenhouse are planned for 1963.

(8) Woody Ornamental Program -

(a) Plant Distribution. Nine shrubs were available for regional trial distribution in the spring of 1962. Cooperators in 11 states requested 599 plants for 24 sites. Plants included Euonymus alata compacta, Lonicera korolkowii Zabelii, Lonicera tatarica (Arnold Arboretum red fruit selection) Potentilla fruticosa cv 'Irving'; cv 'Jackman's'; cv 'Klondyke', X Rosa 'Prairie Fire', X Rosa 'Viking Queen' and X Spiraea arguta compacta. The two rose introductions were made by the Department of Horticulture, University of Minnesota.

In addition, 28 replacements of Pyracantha coccinea cv 'Kasan' were sent out.

(b) Regional Trial Performance Reports. Cooperator evaluations of the five year performance of 15 trees and shrubs planted in 1956 were summarized for the region during the year. Ten of these five year summaries were released to cooperators.

Shrubs: The five year performance reports of the Colorado Redosier dogwood indicated high survival and superior qualities in readily making up into a free flowering shrub, with colored bark, medium large leaves, and hardy growth at every regional trial site.

The regional trial reports for Ligustrum vulgare, P.I. 107630 and P.I. 26767, indicate that the former was easier to establish than the commercial variety 'Amur River North', while P.I. 26767 was somewhat more difficult to establish than 'Amur River North' privet. With respect to hardiness both of these plant introduction accessions were superior to the 'Amur River North.' The good survival and superior hardiness performance of P.I. 107630 has been reported during the year by L. C. Snyder, University of Minnesota and by J. P. Mahlstede, Iowa State University to the Minnesota

and Iowa nurserymen respectively. This common privet introduced from Yugoslavia may prove to be a satisfactory replacement for the 'Amur River North' privet, especially in parts of South Dakota, Minnesota and Wisconsin, where the latter is not reliably hardy.

Trees: Additional reports on the performance of the False Lombardy poplar add weight to the value of this hardy, vigorous clone for windbreak planting throughout the entire region. Other poplars in regional trial have not been as successful as the False Lombardy poplar.

(9) Public relations - During 1962, the Regional Station was host to about 140 visitors, including representatives from private interests, state and federal representatives, various ISU class bodies and foreign countries, including France, Ireland, India, West Africa and Japan.

Several interviews were held for newspaper and magazine articles which ultimately were published.

b. Domestic Exploration

Through financial assistance from the New Crops Research Branch, domestic exploration for native small fruits in Alaska was continued. A report from Alaska as to the number of items collected was not received in time to be included in this report.

c. Evaluation of New Crops for Industrial Utilization

In 1962, 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 closely cooperative among project leaders of several state experiment stations, New Crops Research Branch, USDA-ARS, 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 states.

(1) With assistance of funds provided through NC-7 seed contract agreements, the same 5 states participated in making the 1962 evaluations as in previous years. These states are Indiana, Iowa, Kansas, Minnesota, and Missouri.

In 1962, seed of about 25 species was distributed to each of these 5 states. More emphasis was given to larger scale increases in plots up to 1/2 acre in size of certain crops. This was done with Crambe abyssinica, Foeniculum vulgare and Kenaf. These three species plus Vernonia anthelmintica are showing the most promise of the species tested. Performance of these species is described as follows:

Crambe abyssinica is showing promise as an agronomic crop, but evaluation has reached a point where consideration should be given to development and improvement of the crop. Industrially, it shows a great deal of promise due to the relatively high content of erucic acid oil in the seed. This oil is of value in the manufacture of synthetic fibers, detergents, plastic coatings, resin paints and high detergent lubricants.

The 1962 yield results continue to support the fact that the higher yields are obtained in the central and northern part of the region. This is not to discount the fact that higher yields might be obtainable in the southern part of the region under different management. This aspect needs further study.

The influence of nitrogen, planting rate and row spacing was specifically investigated by the Indiana station. Results showed that by increasing nitrogen, yield can be increased. Increasing seeding rates from 15 to 30 pounds per acre produced variable results, some treatments showed increased yields, others, lower yields. The 7 inch row spacing consistently resulted in higher yields than 14 and 35 inch spacing.

In several trials in Iowa, increased nitrogen application tended to depress yields.

Foeniculum vulgare as a source of petroselenic acid oil did not show as much yield promise in 1962 as it did in 1961. There was adequate growth and flowering for much higher yields than were obtained. For some unknown reason the umbels did not fill, in spite of good insect activity during the blooming period. The 1962 yields were less than expected. Further work and evaluation is needed. The Kansas station plans to take 2nd year yield data on plots established in 1961.

Hibiscus cannabinus, kenaf, as a source of pulp fiber is showing some promise in the region. Generally, higher yields were obtained in the southern parts of the region. The influence of nitrogen fertilization is not clear cut, as some yields were increased by added nitrogen, others, unchanged, or depressed. Inherent soil fertility very likely is a very influential factor.

Vernonia anthelmintica, as a source of epoxy acid oil, is receiving considerable interest and has shown up fairly well in 1962. Only small plot trials were made and this was the first years experience with this crop. Yields were quite variable but some as high as 1100 pounds per acre were obtained on individual plots. The general opinion among cooperating stations was that for the first year, it seemed to show considerable merit as an agronomic crop but seed shattering and the indeterminate flowering habit would present a problem in crop development.

d. Evaluation Program

(1) Evaluation and Research - The Regional Station coordinates evaluation and research information received from cooperators and disseminates it to the North Central Region as well as to the other three Regional Stations and cooperating agencies of the USDA. An effort is also made to coordinate research on certain crop species or individual accessions in search of valuable germ plasm.

Introductions which appear to have special value or unusual characteristics are summarized in Appendix C of this report. They are preliminary reports and observations, in most cases, and should be considered in this light unless otherwise indicated.

(2) State Contributing Projects - In 1962, the NC-7 Regional Project provided funds to assist in the support of 10 contributing projects in 9 states.

A brief summary of state contributing project work underway and reported accomplishments follows:

(a) Alaska. "Evaluation of small fruits indigenous to Alaska." Systematic collection and establishment are continuing. Considerable effort is being devoted to finding the best means of establishing this wild material so that preliminary evaluation can be made. Fragaria and Rubus collections are generally easily established and are multiplying rapidly. Some are nearly to the stage where they could be released to interested breeders as a source of germ plasm for earliness and hardiness. Vaccinium and Ribes species are more slowly established and have made very little growth.

(b) Illinois. "Evaluation of Trifolium, Lotus, Melilotus and Dactylis introductions."

Trifolium: The 35 T. pratense introductions established in 1961 were subjected to severe weed competition during the year of establishment in order to measure seedling competition. Few were able to establish themselves and none had as good a stand in 1962 as did the check variety, 'Kenland'.

Lotus: 39 introductions were established in 1960 in solid seeded rows. Evaluation in 1962 indicated that the following PI numbers were excellent in maintenance of stand and vigor:

222063 L. tenuis (Afghan.)	251146 L. corn. v. ciliatus (Yugosl.)
228150 L. corn. (U.S.S.R.)	251147 L. corn. v. ciliatus (Yugosl.)
228151 L. corn. (U.S.S.R.)	251400 L. angustissimus (Iran)
229569 L. tenuis (Greece)	255302 L. corn. (France)
232097 L. corn. (Germany)	258467 L. corn. (U.S.S.R.)
247898 L. tenuis (France)	

PI's 251146 and 251400 merit further evaluation. Both made a great deal of growth in the fall of 1961 and started early in spring of 1962.

Rod row evaluation of PI 229569 provides further evidence of the superiority of plant vigor and leaf hopper resistance of this introduction. Plant breeders and entomologists who are interested in studying resistance to leaf hoppers should take a look at this introduction

Dactylis: The 38 Dactylis glomerata introductions seeded in rod rows in 1960 were evaluated in 1961 and 1962. The following demonstrated considerable superiority in both years, relative to vigor and other desirable characters:

220877	Ireland	237265	Denmark
230116	Iran	237266	Denmark
230117	Iran	237268	Denmark
231551	Italy	237269	Denmark
235474	Switzerland		

(c) Indiana. "Evaluation of legume and grass introductions." A detailed report on the introductions reported may be found on page 23 of Appendix C for alfalfa and page 14 for Sorghum.

(d) Iowa. No contributing project.

(e) Kansas. "Evaluation of Native Grasses." Panicum virgatum, lowland switchgrass, strain No. 2218, has been approved, and pending an adequate 1962 seed crop on the new increase block, will be released late in 1962.

Many useful breeding materials in a number of native grass species have been obtained from nurseries maintained under project 287 (NC-7).

(f) Michigan. No contributing project.

(g) Minnesota. "Preservation and evaluation of stone fruits." The collection was maintained and was renewed, where necessary, by repropagation. Hybridization was continued with certain wide crosses in an effort to reproduce lost material which has a high potential value for research.

Budwood and seeds were supplied to Experiment Stations in the U.S. and foreign countries.

(h) Missouri. "Evaluation of Lotus corniculatus for resistance to root and crown rot." Fifty-nine plant introductions were tested for resistance or tolerance to common root rot. Only 31 percent of the plants tested survived by August of the second year, and nine tenths of these were badly rotted. Under the severe epidemic induced, all accessions were heavily rotted. Yet small significant differences in persistence and amount of root rot existed among them. The best ten are:

250972	251145	251424	213566	226799
251144	251423	227512	226796	226800

The best 10 were inferior to 3 Missouri entries which represented the improvement from one cycle of selection for persistence.

(i) Nebraska. "Preservation of alfalfa clones and preliminary evaluation of plant introductions." Seedlings of 21 new introductions were transplanted in 1962 making a total of 127 under current evaluation and a total of 597 observed during 1949-1962. Field data for current materials include stand, growth habit, vigor, rate of recovery, and leafhopper reaction.

Details of 1962 findings may be found on page 24 of Appendix C.

(j) Nebraska. "Evaluation of Native Grasses." Varieties for utilization in the Great Plains and Prairie regions are being developed from the superior germ plasm assembled by morphological type and maturity class in the holding nurseries.

(k) North Dakota. No contributing project.

(l) Ohio. "Evaluation of domestic and wild species of tomatoes." A total of 163 tomato introductions were grown for classification, evaluation, and multiplication. Also, the accessions were evaluated for resistance to Alternaria leaf spot and tobacco mosaic. Data from these evaluations is published annually in the seed list of the N. C. Regional Plant Introduction Station.

(m) South Dakota. "Preservation of the Hansen Hardy Fruit Collection." Each year, material is supplied to experiment stations, nurseries, and individuals who request it.

Sandcherry lines (Prunus besseyi) are being tested as rootstocks for peaches. Mr. Ralph S. Roberts, at Fletcher, Oklahoma has found that peaches budded on sandcherry rootstocks retained their leaves and produced fruit of good quality during a drought period.

(n) Wisconsin. No contributing project.

(3) "Pay-off" Introductions for 1962 - On the basis of evaluation reports, it becomes evident that certain introductions have real merit due to disease or insect resistance, various other plant characteristics, and other reasons. This germ plasm may be used in the release of introductions as varieties either with or without genetic change, as a contribution to a variety or simply as "tools" such as indicators, workers, or "genetic bridges." A "pay-off" introduction is considered, at this station, as one for which its merit or value has been proven, or generally accepted by crops workers.

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

Zea mays

P.I. 172331 - Australia. A white dent variety, 'Silver Mine Cross'. Reported as having good stalk quality and root strength and resistance to Fusarium stalk rot and Pythium debarynum. Considered a reasonably good source of stalk rot resistance.

Medicago sativa

(a) P.I. 141462 - Iran. Resistant to stem nematode. Reports were received from the Western Region, W-6, which quite conclusively established this resistance. F. J. Grundbacher and E. H. Stanford reported (1) that resistance is considered to be conferred by one single major factor and (2) demonstrated tetrasomic inheritance of resistance. Their paper titled Genetic factors conditioning resistance in alfalfa to the stem nematode, was published in Crop Science, Volume 2, pages 211-217, 1962.

A small quantity of seed was received from the western regional station and planted in the greenhouse. The flowers were hand-tripped, using a toothpick and a small amount of increase seed was thus obtained under isolated conditions.

(b) P.I. 201864 - Iran. Consistently showing reasonably good resistance to both spotted alfalfa aphid and pea aphid. W. R. Kehr reported this resistance in 1960 and indicated that selections with antibiosis resistance were made. In 1962 he reported that selections with antibiosis resistance to these two insects were intermediate in resistance. Other workers have also reported some degree of resistance.

Cucumis sativus

(a) P.I. 179676 - India. Partially resistant to angular leaf spot and powdery mildew. In Wisconsin it was crossed with SMR 15 and 18 to introduce angular leaf spot resistance. It also carries considerable vigor.

(b) P.I. 196289 - India. Highly resistant to race 2 of Anthracnose. Contributed disease resistance to varieties Polaris and Pixie released by the South Carolina station, as reported by the Southern Regional Station, S-9.

This line is sensitive to photoperiod and will flower only when grown under a 10 hour day.

(c) P.I. 197087 - India, variety 'Silchar.' Reported in 1960. Resistant to several races of Anthracnose; also carries resistance to downy mildew, powdery mildew and mosaic and is being used in many breeding programs.

This line, along with P.I. 196289, also contributed disease resistance to varieties Polaris and Pixie mentioned above.

Lycopersicon peruvianum

P.I. 126928 - Peru. Resistant to a potent strain (#11) of curly top virus. Carries resistance to certain species of root knot nematode and Race 1 of Fusarium oxysporum f. lycopersici and Delray isolates. In Canada it is used as a source of Tobacco mosaic virus.

4. USEFULNESS OF FINDINGS: Results obtained through the NC-7 Cooperative project, through the work done at the Regional Station, at State Experiment Stations and by private enterprise, are mutually useful to plant breeders and research workers. The exchange of information about the value of certain plant introductions and how they may be utilized in respective breeding programs is beneficial to the workers themselves, and ultimately to the public, through release of 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 germ plasm for screening whenever new characteristics are sought.

The regional evaluation work on promising industrial crops is contributing to the knowledge of certain species, 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. An increase in the amount of greenhouse work is anticipated when the addition is complete.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS PREPARED DURING THE YEAR

a. Regional Station

Informal as well as formal publications issued in 1962 are listed below.

(1) 1961 Seed List of available introductions (mimeographed).

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

(3) Newspaper and magazine articles (written by reporters).

(4) Dodge, A. F. Five year report on regional plantings of woody ornamental and shelter plants in the North Central Region, 1956-1960. Loose leaf notebook, North Central Regional Plant Introduction Station, Ames, Iowa. 20 pp. 10 maps (report on 10 shrubs).

(5) Dodge, A. F. North Central Regional Plantings of Woody Ornamental and Shelter Plant Introductions. Paper presented at the 12th annual meeting of the Plant Propagators Society, December 9, 1962, Cincinnati, Ohio. Manuscript for publication is in preparation.

(6) Leppik, E. E. Hosts for plant diseases new for the United States. Reports of the North Central Regional Plant Introduction Station No. 5, 1961.

(7) Leppik, E. E. Stem rust geneology. Mycologia 53:378-405, 1961. Reports of the North Central Regional Plant Introduction Station No. 6.

(8) Leppik, E. E. Seed-borne diseases on introduced plants. Reports of the North Central Regional Plant Introduction Station No. 7, 1962.

(9) Skrdla, W. H. Evaluation of New Crops for industrial utilization. Mimeograph summary of cooperative work at 5 locations reported in 1961.

b. Illinois

(1) Hooker, A. L. and W. A. Russell. Inheritance of resistance to Puccinia sorghi in six corn inbred lines. Phytopathology 52:122-128, 1962.

(2) Hooker, A. L. Additional sources of resistance to Puccinia sorghi in the United States. Plant Disease Reporter 46:14-16, Jan. 1962.

(3) Hooker, A. L. and P. M. LeRoux. Sources of protoplasmic resistance to Puccinia sorghi in corn. Phytopathology 47:187-191, April, 1957.

c. Indiana

(1) Bose, Smritimoy and Jules Janick. Karyo-races in Spinacia oleracea. American Journal of Botany 48:238-241, March, 1961.

d. Michigan

(1) Lockwood, J. L. A seedling test for evaluating resistance of pea to Fusarium root rot. Phytopathology 52:557-559, 1962.

(2) Peterson, C. E. A gynoecious inbred line of cucumber. Mich. Agr. Expt. Sta. Quarterly Bul. 43:40-42, Aug., 1960.

e. Minnesota

(1) Robinson, R. G. Tolerances to herbicides of crop species of potential industrial uses. Eighteenth Annual Research Report, North Central Weed Control Conference. Pages 76-77. December, 1961.

f. Missouri

(1) Lambeth, V. N. 'Tuckers Forcing' a red fruited, wilt and mold resistant forcing tomato. Univ. of Mo. Res. Bul. 597, 8 pages, Jan., 1956.

(2) _____. The Mozark tomato. Univ. of Mo. Res. Bul. 680, 8 pages, Oct., 1958.

(3) _____. The Mosage tomato. Univ. of Mo. Res. Bul. 681, 7 pages, Oct., 1958.

(4) _____. The Tomboy tomato. Univ. of Mo. Res. Bul. 734, 4 pages, Sept., 1960.

g. Nebraska

(1) Newell, L. C. et al. Side-oats grama in the Central Great Plains. Nebr. Res. Bul. 207. April, 1962.

(2) Manglitz, G. R., Kehr, W. R., and Calkins, C. O. Pea aphid resistant alfalfa now in sight. Nebr. Exp. Sta. Quarterly, Spring 1962, 3 pages 5-6-24

h. Wisconsin

(1) Cunningham, J. L. and D. J. Hagedorn. Penetration and infection of pea roots by zoospores of Aphanomyces eutiches. Phytopathology 52:827-834, 1962.

(2) Cunningham, J. L. and D. J. Hagedorn. Attraction of Aphanomyces eutiches zoospores to pea and other plant roots. Phytopathology 52:616-618,1962.

7. APPROVED:

January 22, 1963
Date

C. M. Harrison
Chairman, Technical Committee

January 22, 1963
Date

E. F. Frolik
Regional Administrative Adviser

APPENDIX A

NC-7 STATE CONTRIBUTING PROJECTS, 1962-63 WHICH RECEIVE ASSISTANCE WITH REGIONAL RESEARCH FUNDS

1. Alaska: The Preservation, Multiplication and Evaluation of Indigenous Alaskan Rubus, Ribes, Vaccinium and Frageria. Initiated 7/1/60, $1000. annually. Project 74.

2. Illinois: The Collection, Preservation, and Extensive Evaluation of Trifolium, Lotus, Melilotus, and Dactylis Introductions. Initiated 7/1/56, $500 annually.

3. Indiana: Evaluation of Legume and Grass Introductions. Initiated 7/1/56, $900 annually. Project 890.

4. Kansas: Multiplication, Preservation, and Determination of Potential Value of Forage Grasses and Legumes. Initiated 7/1/49, $1500 annually as of July 1, 1959. Project 287.

5. Minnesota: Introduction, Preservation, and Evaluation of Stone Fruits of Probably Potential Value to the North Central Region. Initiated 7/1/50, $1000 annually. Project 2119 RRF, Hort 2221.

6. Missouri: The Evaluation of Introductions of Lotus corniculatus for resistance to root and crown rot. Initiated 7/1/60, $600 annually.

7. Nebraska: Preservation of Alfalfa Clones and Seed Stocks Needed in Alfalfa Improvement and Preliminary Evaluation of Plant Introductions. Initiated 7/1/49, $700 annually. Project 347.

8. Nebraska: The Introduction, Multiplication, Preservation, and Determination of Potential Value of New Accessions and Strains of Native and Exotic Grasses. Initiated 7/1/49, $1500 annually. Project 348.

9. Ohio: The Evaluation of the Collection of Domestic and Wild Species of Tomato, and the Maintenance of the Desirable Accessions and Valuable Breeding Stocks. Initiated 7/1/49, $1000 annually. Project Hatch 72.

10. South Dakota: The Collecting, Preserving, Cataloguing, Propagating, and Testing of Fruit Plants having Potential Genetic Value. Initiated 7/1/49, $2000 annually as of July 1, 1959. Project 174.

Inventory and summary of accessions received through 1961

Genera	1961 total cumulative	Removed from inventory 1962*	Received 1962	1962 net cumulative	Seed List 1962	** To be increased	Packets Distributed
GRASSES AND FIELD CROPS							
Aegilops	120	0	0	120	109	11	13
Agropyron	185	0	1	186	162	24	114
Agrostis	88	0	3	91	80	11	55
Alopecurus	34	0	0	34	26	8	5
Apera	5	0	0	5	5	0	0
Arrhenatherum	11	0	0	11	11	0	5
Bouteloua	3	3	0	0	0	0	7
Brachypodium	0	1	1	0	0	0	21
Bromus	386	2	4	388	384	4	259
Calamagrostis	10	0	0	10	10	0	5
Cynosurus	8	0	0	8	8	0	2
Dactylis	338	1	1	338	280	58	50
Danthonia	3	0	0	3	3	0	4
Echinochloa	18	2	0	16	16	0	37
Elymus	10	0	0	10	6	4	6
Eremopoa	2	0	0	2	2	0	1
Euchlaena	3	0	0	3	2	1	19
Festuca	184	9	4	179	158	21	66
Guadiniopsis	1	0	0	1	0	1	0
Glyceria	1	0	0	1	0	1	0
Helictotrichon	4	0	0	4	2	2	1
Heteranthelium	3	0	0	3	3	0	1
Hordeum	8	0	0	8	7	1	20
Koeleria	7	0	0	7	4	3	4
Lolium	117	0	1	118	115	3	46
Melica	2	2	0	0	0	0	1
Nardus	2	0	0	2	0	2	0
Neurachne	1	0	0	1	0	1	0
Panicum	167	0	0	167	150	17	213
Pennisetum	1	0	0	1	1	0	3
Phacelurus	1	0	0	1	1	0	1
Phalaris	61	1	2	62	53	9	181
Phleum	47	0	0	47	44	3	18
Poa	50	0	0	50	47	3	24
Polypogon	1	0	0	1	1	0	3
Puccinellia	2	0	0	2	0	2	0
Schedonnardus	1	0	0	1	1	0	1
Secale	5	1	0	4	4	0	5
Setaria	90	0	9	99	89	10	104
Sorghum	13	0	3	16	16	0	74
Sporobolus	2	4	2	0	0	0	8

* 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	1961 total cumulative	Removed from inventory 1962*	Received 1962	1962 net cumulative	Seed List 1962	** To be increased	Packets Distributed
GRASSES & FIELD CROPS cont.							
Tricholaena	2	0	0	2	2	0	2
Tridens	1	0	0	1	1	0	0
Tripsacum	1	0	0	1	0	1	0
Trisetum	4	0	0	4	3	1	2
Triticum	1	0	0	1	1	0	0
Zea							
Introductions	1607	0	35	1642	1586	56	
State O.P. Collections	224	0	0	224	224	0	
Total Zea	1831	0	35	1866	1810	56	3603
TOTALS: Genera-47	3835	26	66	3875	3617	258	5015
LEGUMES							
Anthyllis	2	0	0	2	1	1	0
Astragalus	36	0	0	36	22	14	30
Coronilla	16	0	2	18	13	5	57
Dalea	4	0	0	4	2	2	4
Lathyrus	90	3	40	127	60	67	21
Lespedeza	1	0	0	1	0	1	2
Listia	1	0	0	1	0	1	0
Lotus	149	0	5	154	150	4	244
Medicago	554	2	20	572	563	9	766
Melilotus	168	0	2	170	164	6	36
Onobrychis	47	0	0	47	41	6	20
Psoralea	10	0	0	10	6	4	8
Scorpiurus	7	0	0	7	7	0	4
Tetragonolobus	3	0	0	3	3	0	2
Trifolium	434	10	1	425	396	29	209
Trigonella	131	0	2	133	104	29	117
TOTALS: Genera-16	1653	15	72	1710	1532	178	1521
FRUITS & VEGETABLES							
Allium	264	0	18	282	149	133	48
Apium	56	0	1	57	55	2	0
Asparagus	39	0	16	55	7	48	11
Beta	280	0	4	284	261	23	149
Cucumis	420	17	33	436	393	43	205
Cucurbita	465	69	1	397	382	15	146
Daucus	233	1	13	245	137	108	39
Lactuca	285	24	3	264	215	49	116
Luffa	3	0	0	3	0	3	0
Lycopersicon	2317	0	102	2419	1808	611	1885

APPENDIX B

Genera	1961 total cumulative	Removed from inventory 1962*	Received 1962	1962 net cumulative	Seed List 1962	** To be increased	Packets Distributed
FRUITS & VEGETABLES cont.							
Phaseolus	36	0	0	36	0	36	0
Pisum	1135	1	58	1192	1024	168	2230
Prunus	1	0	0	1	0	1	0
Pyrus	2	0	0	2	0	2	0
Rheum	7	0	0	7	1	6	0
Rubus	83	1	0	82	0	82	2
Spinacia	196	0	0	196	169	27	14
Vaccinium	5	2	1	4	0	4	0
TOTALS: Genera-18	5827	115	250	5962	4601	1361	4846
OIL & SPECIAL							
Brassica	364	1	6	369	312	57	83
Camelina	2	0	0	2	0	2	1
Cassia	0	0	1	1	1	0	0
Chenopodium	1	0	0	1	0	1	0
Comandra	-	-	-	-	0	-	1
Crambe	1	0	10	11	11	0	16
Crotalaria	-	-	-	-	0	-	6
Cyamopsis	5	0	0	5	0	5	0
Cynara	2	0	0	2	0	2	0
Datura	-	-	-	-	0	-	1
Dimorphotheca	1	0	0	1	0	1	6
Eruca	32	0	0	32	32	0	31
Euphorbia	-	-	-	-	0	-	12
Foeniculum	-	-	-	-	0	-	11
Guizotia	1	0	0	1	0	1	1
Helianthus annuus	221	0	0	221	221	0	394
Helianthus spp.	6	0	0	6	5	1	11
Hibiscus	-	-	-	-	0	-	10
Lallemantia	2	0	0	2	0	2	0
Limnanthes	1	0	7	8	0	8	4
Lunaria	-	-	-	-	0	-	1
Mentha	11	0	0	11	7	4	0
Nicotiana	-	-	-	-	0	-	1
Ononis	3	0	0	3	3	0	3
Osteospermum	0	0	1	1	0	1	5
Perilla	11	0	0	11	9	2	0
Raphanus	5	0	1	6	6	0	15
Ricinus	10	0	0	10	0	10	0
Rosa	1	0	0	1	1	0	0
Rudbeckia	-	-	-	-	0	-	5
Salvia	0	0	1	1	0	1	-
Satureja	5	0	0	5	0	5	5
Scabiosis	0	0	1	1	0	1	-
Sesamum	5	0	0	5	0	5	-
Symphytum	1	0	0	1	1	0	3
Vernonia	-	-	-	=	0	-	6
TOTALS: Genera-36	691	1	28	718	609	109	597

APPENDIX B

ORNAMENTALS

Genera	1961 total cumulative	Removed from inventory 1962	Received 1962	1962 net cumulative	Use# in Program	Plants Distributed 1962
PI Abelia	1	0	0	1	G	0
Acanthopanax	1	0	0	1	H	2
Acer	5	4	0	1	G	0
Albizzia	1	0	0	1	H	0
Amorpha	2	1	0	1	PG	0
PI Anagyris	1	0	0	1	G	0
Berberis	2	0	0	2	G	0
PI Betula	3	1	0	2	G	0
PI Berchemia	1	0	0	1	PG	0
PI Buxus	2	0	22	24	G	0
PI Camellia	1	0	0	1	G	0
Caragana	3	1	0	2	G	0
PI Carpinus	1	1	0	0	0	0
Caryopteris	1	0	0	1	PG	0
PI Chrysanthemum	67	10	0	57	G	0
PI Coleus	22	0	1	23	G	0
Cornus	3	0	0	3	G	0
Elsholtzia	1	0	0	1	H	0
Eucommia	1	0	0	1	H	0
Euonymus (1 PI)	6	4	1	3	PGD	75
PI Euphorbia	1	0	0	1	G	0
Forsythia	1	0	0	1	H	0
PI Hedera	1	0	0	1	G	0
Hovenia	1	0	0	1	H	0
Hydrangea	1	0	0	1	PG	0
Indigofera	1	0	0	1	H	0
PI Ilex	4	0	0	4	G	0
PI Iris	1	0	0	1	G	0
PI Ixia	1	0	0	1	G	0
PI Kohleria	1	0	0	1	PG	0
Larix	1	0	0	0	0	0
PI Ligustrum	1	0	0	1	G	0
Lonicera (1 PI)	2	0	2	4	PGHD	135
PI Malus	3	0	0	3	H	0
PI Morus	1	0	0	1	H	0
Pachystima	1	0	0	1	H	0
PI Passiflora	1	0	0	1	G	0
PI Philadelphus	2	0	0	2	G	0
Photinia (1 PI)	1	0	0	1	G	0
Physocarpus	1	0	0	1	PG	0
Picea	1	1	0	0	0	0

D-Plants distributed to Regional Trials; G-Growing at Regional Station; H-Holding (distributed previously); P-Under Propagation.

APPENDIX B

Genera	1961 total cumulative	Removed from inventory 1962	Received 1962	1962 net cumulative	Use# in Program	Plants Distributed 1962
Pinus	3	0	0	3	G	0
Potentilla	1	0	2	3	HD	177
Prunus	1	0	0	0	G	0
Pyracantha	0	0	1	1	D	28
Pyrus	2	0	0	2	G	0
Quercus	1	1	0	0	0	0
Rhododendron	3	0	0	3	G	0
Ribes	1	0	0	1	H	0
Rosa	6	6	2	2	HD	139
Rubus	1	0	0	1	H	0
Salix	2	4	7	5	G	0
Salmia	1	0	0	1	G	0
Salvia	0	0	1	1	G	0
Sambucus	0	0	1	1	PG	0
Sarcandra	0	0	1	1	PG	0
Scabiosa	0	0	1	1	G	0
Securinega	1	0	0	1	H	0
Shepherdia	2	0	0	2	H	0
Sorbus	1	1	0	0	0	0
Spiraea	0	0	0	1	D	73
Strobilanthes	1	0	0	1	G	0
Syringa	1	0	0	1	G	0
Thuja	1	0	0	1	G	0
Vaccinium	1	0	0	1	G	0
TOTALS: Genera-65	183	35	42	190		629

NORTH CENTRAL REGIONAL
PLANT INTRODUCTION STATION
Ames, Iowa

Appendix C to Project NC-7 Annual Report for 1962

PROMISING PLANT INTRODUCTIONS FOR 1962

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

Most of the information listed below is provided by crops workers. However, notes on agronomic and horticultural characteristics are made annually at the Regional Station on introductions grown for seed increase. Those lines which appear to have unusually good appearance in the nursery row are summarized in Part A, Regional Station Observations. Part B, Cooperator Evaluations summarizes information received from crops workers in the North Central Region, as well as other regions.

Most of the results are preliminary and should be considered as such. However, crops workers are encouraged to use them for further evaluation. They are also encouraged to use materials listed in the annual Seed List. One requisite for using this seed is that evaluation reports be submitted on the performance of the material used.

A. Regional Station Observations

1. GRASSES

a. Agrostis spp.

240137 - A. castellana - Portugal - A vigorous, dark green accession that had good appearance in the fall of the second year of growth. All plants overwintered and suffered no winter injury. Early maturing. Susceptible to stem rust, Puccinia graminis (1-5).*

240142 - A. castellana - Portugal - Very similar to PI 240137 but there was some winterkilling and winter injury. Susceptible to stem rust, Puccinia graminis (1-5).

247432 - A. sp. - Africa - This appears to be a good line if it proves to be winterhardy. Only 1 plant was lost over winter and very little injury was noted. It looked good both years, being uniform and showing good vigor. It should be tested for turf use. A specimen was collected for identification. Field resistant to rust.

251250 - A. alba - Pakistan - A vigorous spreader that showed good qualities during the second year. There was no winter killing and very little winter injury. Susceptible to stem rust.

* Indicates that individual plants and/or readings ranged from 1 (disease free) to 5 (heavily infected).

251945 - A. palustris - Austria - Looked especially good during the first year. No winter killing nor winter injury and quite vigorous. Forms a good sod. Also looked good in the 1960-61 planting. Susceptible to stem rust.

b. Alopecurus spp.

267947 - A. pratensis - Hungary - Looked especially good during the second year. It remained green and vigorous late into the fall. No winter killing nor winter injury. Susceptible to stem rust.

270395 - A. pratensis - U.S.S.R. - Similar to PI 267947. Susceptible to stem rust.

c. Bromus spp.

267054 - B. inermis - Poland - A very good appearing line both years. Compares well with 'Fischer'. No winter killing nor winter injury. Resistant to rust.

269876 - B. japonicus - W. Pakistan - Has a very strong tendency toward reseeding. Ground was covered with seedlings on November 1 of year planted. None were present in May of second year. Susceptible to crown rust.

d. Calamagrostis spp.

249726 - C. sp. - Greece - Looked very good, especially during the second year. Leafy, 15-18 inches tall, green, vigorous and strongly rhizomatous. No winter killing nor winter injury. A specimen was taken for identification. Resistant to rust.

e. Dactylis glomerata

237174 - Netherlands - A very good appearing line during both years. Plants are large with fairly wide leaves, vigorous and leafy. Rather late in heading and maturity. No winterkilling nor winter injury apparent. Merits further testing, although it is susceptible to rust.

237175 - Netherlands - Quite similar to PI 237174, possibly a little better. It is green, leafy, vigorous and foliage appeared quite clean in late October of second year. No winterkilling nor winter injury apparent. Merits further testing, although it is susceptible to rust.

267055 - Poland - A good looking line, especially during second year. It is vigorous and color was good in late October. Foliage appeared quite clean also at that time. Susceptible to rust. No winter killing nor winter injury apparent. Merits further evaluation.

269884 - W. Pakistan - A tall, coarse, upright line that performed quite well both years. There was no winterkilling and only slight winter injury but the foliage was affected by frost in the fall more so than the lines described above. Merits further evaluation. Susceptible to rust.

269885 - W. Pakistan - Similar to PI 269884, although not as vigorous in second year. Susceptible to rust.

f. Festuca spp.

251134 - F. rubra - Yugoslavia - A good looking line, especially in the second year. It is vigorous, leafy, has good green color and may have some value for turf. There was no winterkilling and very little or no winter injury. Merits further evaluation. No rust observed.

253308 - F. rubra - Yugoslavia - Very similar to PI 251134. It started its second year as being vigorous, and having good color which carried through to the fall, except for the seed producing period. May also have value for turf. Also looked good in the 1960-61 planting. Merits further evaluation. No rust observed.

264766 - F. arundinacea - Holland - A large, vigorous accession, larger than Alta. It looked good during both, first and second growing seasons. While there was no complete winterkilling, there was considerable winter injury to the plants. However, due to its vigor, the plants quickly recovered. It may have value for turf, particularly in the southern areas of the region. Merits further evaluation. No diseases observed.

278703 - F. rubra - Canada - This is the variety 'Refon' which was originally selected for its hardiness, leafiness and resistance to drought and disease in Canada. It performed very well at Ames during both seasons, having good color, leafiness and vigor. No winterkilling or winter injury. Should be further evaluated for possible turf use. No diseases observed.

g. Lolium spp.

237186 - L. perenne - Holland - One of the best appearing lines grown. Very leafy and vigorous during both seasons and quite hardy. There was some winter injury. However, it did not produce seed during the first nor second seasons. Evidently it is sensitive to daylength. Susceptible to rust.

278704 - L. perenne - Canada - This is the variety 'Norlea' which was selected and developed for its winter hardiness. It performed very well at Ames both years, having good vigor, hardiness and uniformity. There was no winter killing nor winter injury. May have value for turf and merits further evaluation for this purpose. Susceptible to rust.

h. Panicum spp.

268410 - P. antidotale - Afghanistan - A large, vigorous, leafy perennial that performed well at Ames during both years. While this species is not usually hardy at Ames, most plants of this accession overwintered during the winter of 1961-62 with only a small amount of winter injury. It merits further evaluation for hardiness and other characteristics as a forage plant, particularly in the southern part of the region. Older plants are susceptible to leaf spot.

269943 - P. antidotale - W. Pakistan - Similar to PI 268410. Older plants are susceptible to leaf spot.

i. Poa spp.

229721 - P. pratensis - Iran - A good looking accession, being leafy, a good vigorous sod former and having good color. Looked especially good the second year. No winter killing or winter injury. Similar behavior was noted in the 1960-61 planting also. Merits further evaluation for turf. Susceptible to rust.

251251 - P. sp. - Pakistan - One of the best performing Poas of 1961-62. It is vigorous, has good color and is a good sod former. No winterkilling nor winter damage. May have value for turf and should be further evaluated for that purpose. Its identity is pending and specimens have been taken for determination. Very susceptible to stem rust.

j. Zea mays

186191 - Uruguay - Has shown good rust resistance in field tests and is recognized as rust resistant accession, but was susceptible in greenhouse tests.

186209 - Venezuela - Relatively resistant to rust and stalk rot in field tests.

198896 - Argentina - Relatively resistant to rust, but very susceptible to leaf spot.

198897 - Argentina - Same as PI 198896.

172331 - Australia - Resistant to stalk rot according to tests at the Plant Introduction Station and Dr. D. Foley, Botany, ISU.

2. LEGUMES

a. Medicago spp.

251205 - M. sp. - Yugoslavia - Probably M. falcata but identification is being confirmed. This appears to be an unusual line in that it is strongly rhizomatous. Plants spaced 1 foot apart were set in the field on May 7, 1961. By October 27, the plants had grown together to the extent that it was nearly impossible to find the original plants. It has a very prostrate type of growth, but is vigorous and holds leaves well. There appeared to be no winterkilling or injury. This line was previously reported by W. R. Kehr to show leafhopper resistance. It is a poor seed producer and little, if any, will be available. It should receive further evaluation. Resistant to diseases and less susceptible to rust than other Medicago accessions.

253450 - M. pironae - Yugoslavia - One of two accessions of this species (the other is PI 253449). This line is stronger and more vigorous of the two. Both are rhizomatous and low growing. Appears to be quite winterhardy. Tolerant to rust.

263154 - M. falcata - U.S.S.R. - This is one of the better M. falcatas in the collection. Extremely vigorous, producing an abundance of growth (although clipping treatmentswere not applied). Relatively disease-free and very leafy and hardy. Not a good seed producer but merits further attention. Not suffering from diseases, tolerant to rust.

b. Lotus spp.

268068 - L. corniculatus - Portugal - This is a strongly creeping type of plant. In one season the 1 foot spaces between plants in the row were completely filled in. It was not definitely determined whether the creeping habit is due to rhizomes or stolon. Cultivation causes some soil to be thrown into the row which may cover stems and stolons. It is somewhat later than other lines and less vigorous. There appeared to be some winterkilling. However, it merits further evaluation for its apparent creeping habit. Free from disease.

c. Trifolium spp.

250989 - T. medium - Yugoslavia - A good, vigorous but small creeping type. Should receive further evaluation. Resistant to diseases.

253200 - T. medium - Yugoslavia - Appears to be a good line, no winterkilling. Needs more evaluation. Resistant to diseases.

3. VEGETABLES

a. Cucumis spp.

105340 - C. sativus - China - Tolerant to powdery mildew.
164320 - C. sp. - India - Resistant to powdery mildew.
183967 - C. sativus - India - Resistant to powdery mildew.
193498 - C. dipsacus - Ethiopia - Resistant to powdery mildew.
193967 - C. prophetorum - Ethiopia - Resistant to powdery mildew.
196844 - C. ficifolius - Ethiopia - Resistant to downy mildew.
212896 - C. sativus - India - Resistant to powdery mildew.
236468 - C. sp. - Ethiopia - Resistant to powdery mildew.
249562 - C. sativus - Thailand - Resistant to powdery mildew.
261645 - C. sativus - India - Resistant to powdery mildew.

b. Lycopersicon spp. (First year tests)

127828 - L. peruvianum var. humifusum - Peru - Relatively resistant to Alternaria and Septoria leaf spots, but no fruits were developed
193413 - L. esculentum - Ohio - Relatively resistant to Alternaria and Septoria leaf spots.
193422 - L. esculentum - Ohio - Same as PI 193413.
251302 - L. glandulosum - Peru - Same as PI 193413.
251303 - L. hirsutum - Peru - Resistant to Alternaria and Septoria leaf spots.
251304 - L. hirsutum var. glabratum - Peru - Same as PI 251303.
251305 - L. hirsutum var. glabratum - Ecuador - Same as PI 251303.
251311 - L. peruvianum - Peru - Same as PI 251303.
251313 - L. peruvianum var. dentatum - Chile - Same as PI 251303.

B. Cooperator Evaluations

1. GRASSES

a. Agropyron spp.

183009 - A. trachycaulum - Canada - May have value in making intergeneric crosses of barley.

201821 - Triticum orientale x Agropyron sp. - Italy - Appears to have leaf and stem rust resistance. Used in crosses with Lee hard red spring wheat and obtained F_2 plants.

220498 - A. trichophorum - Afghanistan - May have value in making intergeneric crosses of barley.

- A. B. Schooler, North Dakota

Selections were made from the accessions listed below, as described.

249142 - A. cristatum - Portugal - 6 clones selected for long lax spikes, 1 clone for erect heads.

249143 - A. desertorum - Portugal - 3 clones selected for long lax spikes.

250910 - A. cristatum - Iran - 8 clones selected for broad spikes.

251096 - A. cristatum - Yugoslavia - 4 clones selected for broad spikes.

255145 - A. cristatum - Turkey - 13 clones selected for erect heads.

- L. C. Newell, Nebraska

b. Agrostis castellana

The following 2 accessions are very uniform, produce rhizomes and are productive of seed. Five small turf plots were planted from single plants. Appear to have promise for turf, especially if a cross could be made with A. palustris.

240133 - Portugal
240140 - Portugal

- Tim Gaskin, Illinois

c. Bromus spp.

Results of an inoculation experiment of Staganospora bromi on Bromus are reported below. The inoculation studies were made to determine the host range of St. bromi on a number of species of Bromus. Three degrees of infection were designated as disease readings as follows: light - few small scattered pinpoint lesions developed on some leaves; moderate - individual lesions scattered but larger and developed on many leaves; heavy - large distinct lesions developed on many leaves by 10 days following inoculation. Heavy infection type was that obtained on the susceptible B. inermis line used in these tests.

Species		24 hours	48 hours
162779 B. auleticus	Argentina	Negative	Very light
172389 B. riparius	Turkey	Very light	Heavy
172390 B. sp.	Turkey	Negative	Heavy
187000 B. catharticus	Turkey	Negative	Light-Moderate
196321 B. pumpellianus	Germany	Moderate	Heavy

APPENDIX C

Species		24 hours	48 hours
197571 B. rubens	Italy	Light	Heavy
202276 B. willdenowii	Argentina	Light	Moderate
202531 B. adoensis	Belgium	Light-Moderate	Moderate
202532 B. cappadocicus	Belgium	Negative	Moderate
202534 B. setchensis	Belgium	Negative	Moderate
202674 B. alopecuros	Jordon	Light	Moderate-Heavy
203451 B. oxyodon	Turkey	Light	Light-Moderate
204412 B. tectorum	Turkey	Light	Moderate
204424 B. pseudodanthoniae	Turkey	Negative	Light
204426 B. racemosus	Turkey	Negative	Light
204861 B. anatolicus	Turkey	Light	Moderate
204870 B. commutatus	Turkey	Light	Moderate
206415 B. squarrosus	Turkey	Negative	Light
206551 B. arvensis	Greece	Negative	Very Light
207450 B. oxyodon	Afghan.	Light	Light
211006 B. macrostachys	Afghan.	Light	Light-Moderate
211856 B. valdivianus	Chile	Negative	Moderate
219804 B. stamineus	Chile	Very light	Light-Moderate
219997 B. madritensis	Afghan.	Moderate	Moderate
220005 B. danthoniae	Afghan.	Light	Light
220514 B. scoparius	Afghan.	Moderate	Moderate
222968 B. tomentellus	Iran	Moderate	Heavy
223342 B. squarrosus	Iran	Light	Moderate
227661 B. sterilis	Iran	Light	Moderate
229441 B. tomentosus	Iran	Light	Heavy
229527 B. brachystachys	Iran	Light	Moderate
229600 B. fibrosus	Iran	Light-Moderate	Heavy
229939 B. syriacus	Iran	Negative	Moderate
231760 B. ciliatus	N.Hampshire	Very light	Light-Moderate
232193 B. anomalus	Utah	Light	Moderate
232220 B. marginatus	California	Moderate	Heavy
233931 B. barcensis	Canada	Moderate	Heavy
235612 B. secalinus	Cyprus	Moderate	Moderate
239718 B. japonicus	Iran	Very light	Moderate
251683 B. riparius	U.S.S.R.	Light	Heavy

- Judith Ann Helin - Iowa

Chromosome counts were made on several Bromus accessions and are reported below. Accessions marked with an asterisk (*) indicate that there is still some question as to identity, but present indications are that they contain mixtures.

		2N Chromosome Number
*172389 B. spp.	Turkey	42
*172392 B. spp.	Turkey	70
202674 B. alopecuros	Jordon	14
204424 B. pseudodanthoniae	Turkey	28
204861 B. anatolicus	Turkey	14

			2N Chromosome Number
204862	B. anatolicus	Turkey	14
211006	B. macrostachys	Afghanistan	14
211007	B. racemosus	Afghanistan	28
219991	B. danthoniae	Afghanistan	14
220377	B. oxyodon	Afghanistan	28
220378	B. oxyodon	Afghanistan	28
220379	B. oxyodon	Afghanistan	28
220580	B. erectus	Afghanistan	112
229527	B. brachystachys	Iran	14
229600	B. erectus	Iran	56

- U. S. Regional Pasture Lab, Pennsylvania, as reported by NE-9

172390 - B. sp. - Turkey - Makes early spring growth, good recovery after clipping and produces high yield. Possibly a cross between B. erectus and B. inermis.

- New Hampshire, as reported by NE-9

172393 - B. inermis - Turkey - Outstanding in disease resistance but lacks overall vigor and regrowth.

- NE-9 report

The Bromus introductions listed below are showing resistance to brown spot as caused by Pyrenophora bromi.

172579 - B. inermis - Turkey
172760 - B. inermis - Turkey
173650 - B. inermis - Turkey
229938 - B. scoparius - Iran

- S. W. Braverman, NE-9

202534 - B. sitchensis - Belgium
236754 - B. carinatus - Canada - High forage yielders - have promise for breeding or direct use.

- Tennessee, as reported by S-9

229439 - B. tomentellus - Iran - Vigorous and productive throughout growing season - late maturing.
231759 - B. ciliatus - New Hampshire - Very late maturing, slow recovery, leafy. May have place in permanent pasture.
235469 - B. tomentellus - Switzerland - Vigorous and productive throughout growing season. Latest maturing and most promising of B. tomentellus group. May have place in permanent pasture.
251106 - B. erectus - Yugoslavia - Very productive, narrow leaved, good seed production and excellent recovery. May have place in permanent pasture and waterways.

251527 - B. inermis - Yugosoavia - Most productive of B. inermis group. Better than Elsberry variety. Makes excellent recovery and may have use in permanent pasture.

251683 - B. riparius - U.S.S.R. - Vigorous and leafy, stems and leaves pubescent. Early maturing, good recovery - has promise for permanent pastures and waterways.

253301 - B. erectus - Yugoslavia - Narrow leaved, good seed production, good recovery. May have value in permanent pastures and waterways.

- D. Carroll, Michigan

235469 - B. tomentellus - Switzerland - Excellent vigor. Stems and leaves abundant. Mature height, 24"

251527 - B. inermis - Yugoslavia - Cool season perennial with fair vigor and good recovery.

- Wm. Billings, Missouri

d. Dactylis glomerata

173696 - Turkey - High forage yielder - has promise for breeding or direct use - nearly rust free.

- Tennessee, as reported by S-9

The accessions listed below demonstrated considerable superiority, both in 1961 and 1962, for vigor and other desirable agronomic characters.

220877 - Ireland	237265 - Denmark
230116 - Iran	237266 - Denmark
230117 - Iran	237268 - Denmark
231551 - Italy	237269 - Denmark
235474 - Switzerland	

- C. N. Hittle, Illinois

The following two accessions show some tolerance or resistance to brown stripe, Scolecotrichum graminis. Also have fine leaf texture.

225822 - Denmark

230116 - D. gl. v. hispanica - Iran

- Arkansas report

251111 - Yugoslavia - Leafy, makes good seed production, short stems but excessive leaf rust. Shorter stemmed and more leafy than Potomac.

- D. Carroll, Michigan

e. Echinochloa spp.

In initial observations, the following accessions showed promise as wildlife food plants and possible hay on Class II and IIw lands. Made heavy seed production at Americus, Georgia

183332 - E. frumentacea	India
196291 - E. crusgalli	India
219606 - E. crusgalli	Pakistan
256044 - E. pyramidalis	S. Rhodesia

- S-9 report

The following two accessions of Echinochloa crusgalli were considered good possibilities for wild duck feed:

196291 - India
211025 - Afghanistan - Produced a yield of 449 lbs. seed per acre.

- S-9 report

196291 - E. crusgalli - India - High yielding forage plant that has promise for breeding or direct use.
217911 - E. frumentacea - India - One of 29 forage grasses showing highest dry weight yield, at 4.32 tons in 3 cuttings.

- Tennessee, as reported by S-9

223254 - E. coarctata - Afghanistan - High seed production for use as duck food.

- W-6 report

f. Euchlaena mexicana

162704 - Mexico - One of 29 forage species showing the highest dry weight yield, 5.25 T per acre. Harvesting for seed would be a special problem. The plant is very susceptible to bud worm and cannot compare with corn for silage or grain.

- S-9 report

g. Festuca spp.

Chromosome counts were made on several Festuca accessions and are reported below.

		2N Chromosome Number
196324 F. violacea	Germany	28
208099 F. longipes	Union of S.Africa	42
222104 F. kronenbergii	Afghanistan	42
222989 F. sclerophylla	Iran	42
232299 F. thurberi	Colorado 1 plant,42;4pl.,28	
234907 F. laxa	Switzerland	42
235074 F. laxa	Switzerland	42
236847 F. ovina	Canada	42
236850 F. scabrella	Canada	56
236851 F. scabrella	Canada	56

- U.S. Regional Pasture Lab, Pennsylvania, as reported by NE-9

237180 - F. rubra - Holland - Very impressive for ground cover. Nearly comparable to 'Sioux' but much better than 'Illahee'. May have place in gully and bank stabilization.
250965 - F. rubra - Yugoslavia - Very fine leaved - might have possibility for bank cover.

- D. Carroll, Michigan

200321 - F. rubra - Denmark - Good turf density and spreading habit, moderate leaf spot.
237182 - F. rubra var. commutata - Holland - Good turf density, light leaf spot.
250967 - F. ovina - Yugoslavia - Dark green turf, very fine leaf, attractive, no rhizomes.
251307 - F. rubra - Yugoslavia - Fine leaves, very little leaf spot.
251118 - F. elatior - Yugoslavia - Average turf appearance, fine leaves, light leaf spot.
251665 - F. rubra - Yugoslavia - Average turf appearance, light leaf spot.
253310 - F. rubra - Yugoslavia - Average turf density, light leaf spot.
255421 - F. rubra - Yugoslavia - Good turf density, light leaf spot.
255423 - F. rubra - Yugoslavia - Good turf density, light leaf spot.

- Tim Gaskin, Illinois

h. Lolium multiflorum

The two accessions listed below were reported as being a source of crown rust resistance for transfer to L. perenne.

194395 - Uruguay
201980 - Uruguay

- Reported by W-6

i. Panicum spp.

The accessions listed below have potential as wildlife food plants. They are among the highest seed producers out of 35 tested at Americus and/or Coffeeville, Georgia.

163300 - P. miliaceum - India
178992 - P. miliaceum - Turkey
179385 - P. miliaceum - Turkey
179389 - P. miliaceum - Turkey
198153 - P. miliaceum - India
198154 - P. miliaceum - India
202294 - P. miliaceum - Argentina
202295 - P. miliaceum - Argentina
251389 - P. miliaceum - Iran
251404 - P. miliaceum - Iran
251405 - P. miliaceum - Iran

- Reported by S-9

180484 - P. ramosum - India - Susceptible to Panicum mosaic virus.
219607 - P. antidotale - Pakistan - A symptomless carrier of P. mosaic virus.
221079 - P. turgidum - Israel - Susceptible to P. mosaic virus.
238345 - P. decompositum - South Africa - Susceptible to P. mosaic virus.
250787 - P. miliaceum - Afghanistan - Susceptible to P. mosaic virus.
253718 - P. maximum - India - Immune to P. mosaic virus.

- W. H. Sill and L. T. Talens. Nov. 1962. New hosts and characteristics of the Panicum mosaic virus. Plant Disease Reporter 46: 780-783.

253716 - P. antidotale - India - High yielding forage plant - has promise for direct use or breeding.

253718 - P. maximum - India - One of 29 forage grasses showing the highest dry weight yields at 5.01 tons in two cuttings.

- Tennessee, as reported by S-9

j. Phalaris arundinacea

235023 - Germany - Very leafy and more productive than Ioreed or Commercial. Excellent recovery. May have place in permanent pastures.

235485 - Switzerland - Appears to be an early starter but otherwise no better than Ioreed.

251426 - Yugoslavia - Productive, vigorous, good recovery but coarse stemmed. More productive than Commercial or Ioreed. May have place in permanent pastures.

269728 - Illinois - This line is a dwarf type received through V. B. Hawk. Mr. Carroll reports that it is winterhardy, having vigor better than Commercial or Ioreed, and appears to be resistant to diseases. An apparent dwarf or low growing type that may have a place in waterways. Considered to be a low seed yielder. In the observational 10 foot row, only 10 clones produced seed heads. Did not produce seed at all during the first year.

- D. Carroll, Michigan

k. Poa spp.

225823 - P. trivialis - Denmark - Good turf appearance, resistant to mildew, spreading.

227673 - P. pratensis - Iran - Average turf appearance but segregates for mildew resistance.

229778 - P. pratensis - Iran - Poor turf density but resistant to mildew.

230129 - P. pratensis - Iran - Average turf appearance but resistant to mildew.

230132 - P. pratensis - Iran - Good turf density and resistant to mildew.

234781 - P. pratensis - Germany - Good turf appearance, segregating for mildew resistance, resistant to leaf spot and has good rhizomes.

236919 - P. pratensis - Canada - Good turf appearance, susceptible to mildew but resistant to leaf spot.

236920 - P. pratensis - Canada - Good turf appearance and resistant to leaf spot.

250657 - P. pratensis - W. Pakistan - Thin turf appearance but resistant to mildew.

251407 - P. trivialis - Iran - Upright, resistant to mildew, vigorous.

253196 - P. pratensis - Yugoslavia - Poor turf appearance - bunch type but resistant to mildew.

254909 - P. bulbosa - Iraq - Poor turf appearance, resistant to mildew. No leaf spot evident, very fine leaves.

255476 - P. palustris - Yugoslavia - Good turf density, segregating for mildew resistance, slight leaf spot.

255890 - P. pratensis - Poland - Average turf appearance, segregating for mildew resistance and light leaf spot.

- Tim Gaskin, Illinois

204485 - P. compressa - Turkey - In turf trials, appeared to be immune to mildew and rust at the Arkansas Experiment Station.

- Reported by S-9

l. Secale sp.

240285 - S. anatolicum - Turkey - Has spot blotch resistance, but so far, crosses with cultivated barley were unsuccessful. Has been crossed with Hordeum bulbosum.

- A. B. Schooler, North Dakota

The following species were tested at Wisconsin and found to be less vigorous than common rye:

240285 - S. anatolicum - Turkey
240286 - S. montanum - Turkey - This line appears to have short lemma awns. A cross with this line was attempted.
253956 - S. montanum - Iraq
253957 - S. vavilovii - Afghanistan

- H. L. Shands, Wisconsin

m. Setaria spp.

177543 - S. italica - Turkey - High yielding forage plant - has promise for breeding or direct use.

- Tennessee, as reported by S-9

204627 - S. verticillata - Turkey - Susceptible to Panicum mosaic virus.
213277 - S. sphacelata - India - Immune to Panicum mosaic virus.

- W. H. Sill and L. T. Talens. Nov. 1962. New rusts and characteristics of the Panicum mosaic virus. Plant Disease Reporter 46:780-783.

n. Sorghum spp.

Forage sorghum selections from the following introductions were made in 1961 for sources of selfed lines, crossing onto male steriles, and intercrosses for lodging inheritance studies:

S. vulgare

63923	China	L4	217688	Egyptain Sudan	L3,L2 & L4
170781	Turkey	L1, L3	217689	Egyptain Sudan	Short, L1
174379	Turkey	L3	217691	Egyptain Sudan	L9
174381	Turkey	L2, L3	217725	Egyptain Sucan	L4
177079	Turkey	L6	217778	Egyptain Sudan	L4
177552	Turkey	L9	217781	Egyptain Sudan	L4-6
179504	Turkey	L9	217826	Egyptain Sudan	L6, variable
179747	India	L2	217829	Nebraska	L4
181075	India	L3	217889	Nebraska	L2
181080	India	L8, open head	221613	Africa	L9
181084	India	L9, open head	221619	Africa	L9,L2 & L8
183149	India	L3	221637	Africa	L9
183477	India	L3	221638	Africa	L7
185606	Egypt	L2-4	221685	Africa	L3, tall
186232	Costa Rica	L1	221728	S. Africa	L3
192879	Java	L1, L5	223819	Afghanistan	L2
217681	Egyptian Sudan	Tall,L3,5,6	236278	Australia	Short, L1

- R. C. Pickett, Indiana

156549 - S. arundinaceum - S. Rhodesia - Suhi-1, a new sudangrass hybrid developed from this line and combine Kafir 60, was released in Georgia. This hybrid is characterized by a long production period, high yield of forage, disease resistance, and late maturity.

- Reported by S-9

192879 - S. vulgare - Java - This line is of special interest because of its long kafir type head.

- O. J. Webster, Nebraska

The following lines are being used in breeding program for their medium height and good head exertion.

Sorghum vulgare

267389 - India
267499 - India
267500 - India
267501 - India
267509 - India

- R. E. Atkins, Iowa

o. Triticum monococcum

170196 - Turkey - Crossed readily with T. aesitivum, F_1's very robust but completely sterile. Therefore it could not be used in further breeding work.

- R. L. Ellsworth, Kansas

p. Zea mays

162571 - (Sweet) - Argentina - Fairly good lodging resistance for a sweet corn.
163597 - (Dent) - Guatemala - Largest number of roots of all corns tested in a root worm study in 1962. 71 accessions in test.
165458 - (Dent) - Mexico - No lodging - tough roots.
177631 - (Pop) - Turkey - Low rootworm counts and low percent damage to roots.
186185 - (Flint) - Uruguay - No lodging, few larvae but high percent of damaged roots.
186199 - Australia - No lodging but highest of 70 lines in rootworm number.
186209 - (Flint) - Venezuela - No lodging, low percent root damage.
186225 - Australia - No lodging and low rootworm numbers.
198898 - Argentina - Lodges, but had few rootworm larvae.
198906 - (Flint) - Argentina - Better than average in all rootworm criteria.
213716 - (Dent) - Iowa - Low percent of rootworm damage on nodes 4, 5 and 6 of roots.
214295 - 'Pride of Saline' - (Dent) - Kansas - No lodging, low percent of root damage from corn rootworms.
217413 - 'Zapalote Chico' - (Dent) - Mexico - No lodging in corn rootworm test.
217464 - (Flint) - New York - Few roots but few rootworm larvae also.
218149 - (Dent) - New Mexico - Low corn rootworm larvae populations.
218179 - (Flour) - Arizona - Best of 5 flour corns tested against rootworm damage.

240320 - (POP) - Bolivia - No lodging, had the most roots of 6 popcorns tested in 1962.
240328 - (Pop) - Bolivia - Had the lowest amount of corn rootworm damage of popcorns tested in 1962. No rootworm pupae.

- Don Peters, Iowa

162571 - (Sweet) - Argentina - Crossed with adapted midwestern lines for development of second cycle lines.
174418 - (Sweet) - Turkey - Free of tillers.
177107 - (Sweet Flint) - Turkey - Male sterile.
179570 - (Flint) - Turkey - Free of tillers.
231739 - (Sweet) - Turkey - Male sterile.
255983 - (Sweet) - Maine - Crossed with adapted midwestern lines for development of second cycle lines.

- R. H. Andrew, Wisconsin

162700 - (Flint) - Argentina - Prolific, 2-eared.
167971 - Turkey - Prolific - 2-eared.
210404 - (Dent) - South Africa - Prolific, 2-eared.
228175 - Russia - Prolific - 2-eared.
257607 - (Dent Flint) - Ethiopia - Prolific - 2-eared.
257610 - Ethiopia - Prolific, 2-eared.
262498 - (Dent Flint) - U.S.S.R. - Prolific, 2-eared.
267181 - (Dent Flint) - U.S.S.R. - Prolific, 4-eared.
267185 - (Flint) - U.S.S.R. - Prolific, 3-eared.

- J. D. Somers, Illinois

The following lines carry dominant protoplasmic resistance to Puccinia sorghi:

163558 - Guatemala 163563 - Guatemala 172332 - Australia

193906 - Ethiopia - Carries recessive protoplasmic resistance to Puccinia sorghi.

- A. L. Hooker & P. M. LeRoux. Sources of protoplasmic resistance to Puccinia sorghi in corn. Phyto. 47:187-191. 1957.

The following lines are highly resistant to Puccinia sorghi:

163558 - Guatemala - Also resistant to a majority of the cultures used. Three genetically different inbreds were obtained from this line.
172597 - (Flint Dent) - Turkey.
186191 - Uruguay - Also resistant to a majority of the cultures used.
213777 - South Dakota - Also resistant to a majority of the cultures used.

The following lines are resistant to Puccinia sorghi:

214297 - 'Thomas Utility White' - (Dent) - Illinois.
217405 - 'Gourdseed' - (Dent) - Texas.
217415 - 'Draughtproof' - (Dent) - W. Virginia

218186 - (Flour) - Arizona.
221845 - 'Homedale' - South Africa.
251653 - 'Maximear Early' - Yugoslavia.
251655 - Yugoslavia.

- A. L. Hooker, Additional sources of resistance to Puccinia sorghi in the U.S. Plant Disease Reporter 46:14-16, 1962.

Ratings for resistance to corn borer feeding are given below: 1 - light, 9 - heavy.

	Rating		Rating
166161 - India	2	177118 - Turkey	2
167979 - Turkey	2	177595 - Turkey	2
168006 - Turkey	2	177607 - Turkey	2
174990 - Burma	2	186211 - Peru	2
175969 - Turkey	2	193423 - Israel	2
175970 - Turkey	2	193433 - Roumania	2
177115 - Turkey	2		

- F. F. Dicke, Iowa

The following are being used in breeding program because they have no suckers:

167959 - Turkey 167968 - Turkey

- C. Norskog, Minnesota

167975 - (Flint) - Turkey - Early, no suckers, 67 days to silking.
167981 - (Flint) - Turkey - Early, no suckers, 65 days to silking.
167991 - (Flint) - Turkey - No suckers, 69 days to silking.
167992 - (Flint)(sh) - Turkey - No suckers, 70 days to silking.
167995 - (Flint) - Turkey - No suckers, 66 days to silking.
167997 - Turkey - Stands well, 74 days to silking.
168005 - (Flint) - Turkey - No suckers, 75 days to silking.
172593 - (Flint) - Turkey - No suckers, 65 days to silking.
185665 - Haiti - Late but prolific.
200199 - (Flint) - Italy - Orange color, 70 days to silking.
200204 - France - No suckers, 65 days to silking.
207528 - (Flint) - Afghanistan - Orange color, 65 days to silking.
213778 - (Flint) - S. Dakota - Early, 2-eared plants were selected. 67 days to silking.
222468 - 'Nothstine' - (Dent) - Michigan - Good vigor, stands well, large, wide kernels. 72 days to silking.
228173 - Russia - 65 days to silking.
228176 - Russia - Good standability, 70 days to silking.
231227 - (Flint) - Canada - Early, 57 days to silking.
231228 - (Flint) - Canada - Early, 56 days to silking.
251884 - U.S.S.R. - 65 days to silking.
251934 - (Dent) - U.S.S.R. - Loose husk when dry. 69 days to silking.
267160 - (Dent) - U.S.S.R. - Hard dent, good stalks.

- C. Norskog, Minnesota

The following accessions produced abnormal plants, generally seedling characteristics, mostly yellow stripe.

168025 - Turkey
177589 - Turkey - Chlorophyll deficient mutants are being used in breeding.
177591 - Turkey - Produced 1 plant of the yellow-stripe phenotype. This mutant is not allelic with the classic yellow-stripe-1 and responded to foliar applications of ferrous sulphate by greening.
177647 - Turkey
179561 - Turkey - (Same characteristics as for 177591 above).
185065 - Turkey - Chlorophyll deficient mutants used in breeding.
185845 - (Pop) - Czechoslovakia
194047 - Ethiopia- Mutants being used in breeding program.
196127 - Ethiopia - Produced 1 plant of the yellow-stripe phenotype. This mutant is of the Ys-1 type and responded to foliar application of ferrous sulfate by greening.
198902 - Argentina
198905 - (Flint) - Argentina
200292 - Yugoslavia
200296 - Yugoslavia - (Same characteristics as for 196127 above).
200305 - Yugoslavia
204791 - Turkey
204817 - Turkey
213763 - North Dakota
213801 - North Dakota
217461 - (Dent Flint) - Pennsylvania - (Same characteristics as for 196127 above).
231738 - Turkey
239102 - Yugoslavia - Mutant used in breeding program.
239115 - Yugoslavia - Mutant used in breeding program.
247750 - Belgian Congo

- W. D. Bell, Pennsylvania, as reported by NE-9

The following accessions are possibly resistant to Pythium debaryanum but reaction is variable:

172323 - (Dent) - Australia
172327 - (Dent) - Australia
172331 - 'Silver Mine Cross' - Australia
172333 - (Dent) - Australia

The following show resistance to Fusarium stalk rot but resistance is variable:

172330 - (Dent) - Australia
172331 - 'Silvermine Cross' - (Dent) - Australia

- D. C. Foley, Iowa

172331 - (Dent) - 'Silver Mine Cross' - Australia - Resistant to Diplodia zeae and Gibberella zeae.
213713 - (Dent) - Missouri - Resistant to Helminthosporium turcicum.

- Wm. Ambrose, Delaware

172332 - Australia - Used in a study of the inheritance of resistance to corn rust.

- A. L. Hooker and W. A. Russell. Inheritance of resistance to Puccinia sorghi in six corn inbred lines. Phytopathology 52:122-128, 1962.

185444 - New Hampshire - Inbred lines obtained from crosses with this PI are still being evaluated, both field and sweet types. Extremely early Spancross season. Lines selected out of this accession are very early and yet vigorous growers. To be maintained and used in production.

- Report from NE-9

The following lines are reported to be multi-eared:

186191 - Uruguay
198898 - Argentina
198900 - Argentina
204838 - Turkey
217407 - 'Tom Thumb' (Pop) - Peru
217474 - New York
244068 - Yemen

- Reported by NE-9

The following lines showed no infection when inoculated with race 1 strain of Helminthosporium carbonum. Susceptible to race 2 of the same species.

186208 - (Flint) - South Africa
198902 - Argentina

- Alice L. Robert. New Hosts for three Helminthosporium species from corn. Plant Disease Reporter 46:321-324,1962.

204830 - (Flint) - Turkey - A number of male steriles found in progeny, assume this may be a cytoplasmic male sterility because of the high number.
213776 - 'Northwestern Dent' - North Dakota - Dent line selected from this accession carries an apparently recessive free-husking character. Also suspect presence of good pollen restorer genes. Crosses are in progress.
213806 - 'Mandan Black' - North Dakota - Very bushy grower with many tillers and prolific earing.
214194 - Canada - Three lines selected out of this accession for earliness and vigor, maintained and used in production.
217413 - 'Zapalote Chico' - (Dent) - Mexico - Has possible earworm resistance. All being crossed into sweet corns and increased.
218143 - New Mexico - Possible earworm resistance; all being crossed into sweet corns and increased.

231296 - (Sweet) - Northrup-King - Possible earworm resistance. All being crossed into sweet corns and increased.

231741 - (Sweet) - Turkey - A 16-rowed narrow-kerneled type that has excellent type plants with very few tillers and a strong stalk. No flag leaves on the ears and is midseason in maturity.

- Reported by NE-9

213806 - 'Mandan Black' - North Dakota - Maturity is satisfactory for Eastern Ontario. This line shows recessive tillering. Will be grown again in 1963.

- L. S. Donovan, Canada

The following lines are extremely early and silk 30-45 days after emergence.

214200 - 'Rutherford' - Canada
214202 - 'Saskatchewan White Flint' - Canada
214279 - 'Gaspe' - (Flint) - Canada
217412 - 'Tom Thumb' - (Pop) - Iowa
218039 - Holland
245134 - U.S.S.R.
251884 - U.S.S.R.

Used in breeding program as a source of Helminthosporium resistance and prolificacy:

217407 - 'Tom Thumb' - (Pop) - Peru

- A. F. Troyer, Minnesota

The following lines are used as a source of earliness in breeding program:

214274 - (Flint) - Canada
214275 - (Flint) - Canada
214276 - (Flint) - Canada
214277 - (Flint) - Canada
214278 - (Flint) - Canada
214279 - 'Gaspe Flint' - Canada
214280 - (Flint) - Canada
214281 - (Flint) - Canada
217412 - 'Tom Thumb' - Iowa

- J. H. Lonnquist, Nebraska

217412 - 'Tom Thumb' - Iowa - Used in breeding program as a source of early germ plasm.

- Carl Hartman, Indiana

217413 - 'Zapalote Chico' - Mexico - Shows resistance to corn earworm. In nursery it had 92.8% non-infested ears and had a mean damage grade of 0.12 based on 0 with no damage and 5.0 as maximum damage. It has a very tight and tough husk which probably gives it the resistance.

- L. M. Josephson, Tennessee, as reported by S-9.

The following 2 lines were continued in an inbreeding program as sources of disease resistance in back crossing program. Have good resistance to Helminthosporium turcicum.

217460 - (Flint) - Pennsylvania - 65 days to silk.
217461 - (Flint) - Pennsylvania - 69 days to silk.

- L. M. Jones, Illinois

2. LEGUMES

a. Lathyrus ochrus

226008 - Australia - Pods resist shattering fairly well.

- R. G. Robinson, Minnesota

b. Lotus spp.

The following 10 L. corniculatus introductions have the most persistence and most tolerance to root and crown rot during initial evaluations. However, they were not as resistant as 3 Missouri entries which represented the improvement from one cycle of selection for persistence.

213566 - Italy
226796 - Holland
226799 - Germany
226800 - Greece
227512 - Iran
250972 - Yugoslavia
251144 - var. ciliatus - Yugoslavia
251145 - var. ciliatus - Yugoslavia
251423 - Yugoslavia
251424 - var. ciliatus - Yugoslavia

- J. O. Baldridge, Missouri

180171 - L. corniculatus - Czechoslovakia - Used in breeding program for its longevity and disease resistance.

- W. H. Billings, Missouri

The following accessions are excellent in their ability to maintain stand and vigor:

222063 - L. tenuis - Afghanistan
228150 - L. corniculatus - Russia
228151 - L. corniculatus - U.S.S.R.
229569 - L. tenuis - Greece - In the spaced plant evaluation in 1961, this accession appeared to be resistant to leaf hoppers as well as possessing considerable vigor. Rod row evaluations are further evidence of the superiority of plant vigor of this introduction. Plant breeders and entomologists who are interested in studying resistance to leafhoppers should take a look at this introduction.
232097 - L. corniculatus - Germany
247898 - L. tenuis - France
251146 - L. corniculatus var. ciliatus - Yugoslavia - Merits further evaluation. It made a great deal of growth in the fall of 1962 and started growing early in the spring of 1962.
251147 - L. corniculatus v. ciliatus - Yugoslavia

251400 - L. angustissimus - Iran - It made a great deal of growth in the fall of 1961 and started growing early in the spring of 1962.
255302 - L. corniculatus - France
258467 - L. corniculatus - 'Morshansk 528' - U.S.S.R.

- C. N. Hittle, Illinois

251143 - L. corniculatus - Yugoslavia - Very vigorous and productive, fine stemmed and leafy. Excellent recovery and late maturing. May have place in permanent pasture and ground cover.
251147 - L. corniculatus v. ciliatus - Yugoslavia - Vigorous, early maturing, excellent recovery after clipping. Very productive, leafy - may have value in permanent pasture.
251149 - L. tenuis - Yugoslavia - Vigorous, late maturing, excellent ground cover, maintains green color late into fall. May have place in permanent pasture and ground cover.
251422 - L. corniculatus var. ciliatus - Yugoslavia
251423 - L. corniculatus - Yugoslavia - The above two accessions are early maturing, produce heavy seed set and make excellent recovery. May have place in permanent pasture and ground cover.

- D. Carroll, Michigan

251147 - L. corniculatus v. ciliatus - Yugoslavia - Has excellent vigor.

- Wm. Billings, Missouri

c. Medicago spp.

141462 - M. sativa - Iran - Resistant to all collections of stem nematodes tested and resistant over a range of temperatures.

- California, as reported by W-6

141462 - M. sativa - Iran - Resistance to stem nematode considered to be conferred by one single major factor - Tetrasomic inheritance of resistance was demonstrated.

- F. J. Grundbacher and E. H. Stanford. Genetic factors conditioning resistance in alfalfa to the stem nematode. Crop Science 2:211-217,1962.

175789 - M. sativa - Turkey - Six selections made for further evaluation; have some root rot resistance and other survival virtues under humid conditions.
180303 - M. sativa - India - Strong seedling vigor and rapid recovery; 3 selections made for use in synthetics.
226518 - M. sativa - Iran - Several spotted aphid resistant plants isolated from this number for use in crosses.
222287 - M. sativa - Iran - Excellent seedling vigor, fast recovery and good color.
228350 - M. sativa - Iran - Good vigor and recovery. Above average in leafhopper resistance.

- D. F. Beard, as reported by NE-9

The following accessions have vigor superior to check varieties:

196218 - M. sativa - India
196224 - M. sativa - India
196231 - M. sativa - India
196232 - M. sativa - India
196233 - M. sativa - India
201208 - M. sativa - Australia
233196 - M. sativa - U.S.S.R.
233197 - M. sativa - U.S.S.R.
233198 - M. sativa - U.S.S.R.
234481 - M. sativa - Spain
234817 - M. falcata - Switzerland
235093 - M. sativa - Germany
236605 - M. sativa - France
238150 - M. sativa - Turkey
243223 - M. sativa - Iran
250740 - M. sativa - Iran
251225 - M. sativa - Yugoslavia
255883 - M. sativa - Poland
255884 - M. sativa - Poland

The following accessions show resistance to blackstem:

196222 - M. sativa - India
196223 - M. sativa - India
196231 - M. sativa - India
196240 - M. sativa - India
204886 - M. falcata - Turkey
223789 - M. sativa - Afghanistan
234816 - M. falcata - Switzerland
235021 - M. falcata - Switzerland
238153 - M. sativa - Turkey
239955 - M. sativa - Algeria

The following accessions show tolerance to leafhopper:

196237 - M. sativa - India
206456 - M. falcata - Turkey
234643 - M. sativa - Spain
235021 - M. falcata - Switzerland
238152 - M. sativa - Turkey
238153 - M. sativa - Turkey
239955 - M. sativa - Algeria

The following accessions show tolerance to pea aphid:

196245 - M. sativa - India
235021 - M. falcata - Switzerland

- R. L. Davis, Indiana

Several plants from the following introductions were selected for their resistance to spotted alfalfa aphid:

196239 - M. sativa - India
201864 - M. sativa - Iran
211609 - M. sativa - Afghanistan
219928 - M. sativa - Afghanistan
220530 - M. sativa - Afghanistan
222733 - M. sativa - Iran
234205 - M. sativa - 'Bam' - Iran

204591 - M. sativa - Turkey - Very vigorous plants which do not show any winter dormancy in the fall.

204889 - M. sativa - Turkey - Evaluating for plants with leaf disease resistance and potato leafhopper tolerance.

205329 - M. sativa - Peru - Several plants were more tolerant to potato leafhopper the first year in the field but almost winterkilled that winter.

206278 - M. sativa - Turkey - Evaluating for plants with leaf disease resistance and potato leafhopper tolerance.

229954 - M. sativa - Iran - Some plants have good resistance to leaf diseases. Prostrate and erect plant types.

234482 - M. sativa - Spain - Some tolerance to potato leafhopper.

251830 - M. falcata - Austria.- Source of leaf disease resistance.

- J. Miller, Iowa

Selections from the following introductions with antibiosis resistance to both spotted alfalfa and pea aphids were intermediate in resistance.

201864 - M. sativa - Iran
234205 - M. sativa - 'Bam' - Iran

The first generation of a synthetic made from intercrossing 11 sativa-type clones which showed leafhopper resistance for 2 years, 3 clones which were selected from the following introductions, showed a high level of resistance in 1962.

204839 - M. sativa - Turkey
206278 - M. sativa - Turkey
243224 - M. sativa - Iran

Selections with antibiosis resistance to both spotted alfalfa and pea aphids from the following accessions were susceptible to leafhopper.

207494 - M. sativa - Afghanistan
217419 - M. sativa - Denmark

Selections from the following introductions with apparent leafhopper resistance in 1961 were propagated and tested in clonal rows in 1962. Selections were intermediate in resistance.

258330 - M. sativa - U.S.S.R.
258757 - M. falcata - U.S.S.R.
258838 - M. sativa - U.S.S.R.
258840 - M. sativa - U.S.S.R. - Selections were found to be susceptible.

260246 - M. falcata - Germany - A selection with resistance to leafhopper and the spotted alfalfa aphid was obtained from this accession.

One or more selections with apparent leafhopper resistance were obtained from the following accessions in 1962:

269930 - M. sativa - W. Pakistan
270315 - M. tianschanica - Sweden

- W. R. Kehr, Nebraska

Fifty alfalfa introductions were tested for resistance to Pythium irregulare in 1961-62. The variety 'Rhizoma' showed highest resistance and the introductions were compared with it. Several accessions of M. falcata had high levels of resistance but none as high or higher than 'Rhizoma'. The following survival figures are reported:

Ploidy		% Survival
Tetraploid	204458 - M. falcata - Turkey	85.90
Tetraploid	204885 - M. falcata - Turkey	84.85
Tetraploid	204457 - M. falcata - Turkey	80.78
Not listed	255178 - M. sativa 'Varia' - Poland	74.42

Tetraploids showed higher tolerance than diploids.

- E. L. Sorensen, Kansas

206572 - M. sativa - Greece - Good cool season leguminous forage - slightly rhizomatous at Americus, Georgia.

239953 - M. sativa - 'Gaetula' - Algeria - Has increased resistance to egg laying by the adult alfalfa weevil as measured by eggs per cluster and eggs per inch of stem in greenhouse studies. In one test, it averaged 3.8 eggs per inch stem and 4.7 eggs per cluster compared with 20.7 and 11.5 respectively for variety 'Atlantic'. In another test it averaged 1.5 eggs per inch of stem and 4.0 eggs per cluster compared with 9.1 and 10.6 for 'Cherokee' plants. Although it needs to be tested under field conditions, it appears very promising on basis of greenhouse tests. (This work was performed by J. W. Dudley, North Carolina.)

- Reported by S-9

217419 - M. sativa - Denmark - Good Flemish type. (Starling)

229570 - M. sativa - Greece - Vigorous, black stem resistance high, moderate leaf spot resistance. Being tested for combining ability (one clone).(W. W. Washko)

231042 - M. sativa - India - Tolerant to chewing insects.(Starling)

231731 - M. falcata - (Wisc. 460) - Excellent leaf spot and leafhopper resistance. (W. W. Washko)

233750 - M. falcata - Italy - Fairly good rhizome development, used in crosses.

234438 - M. sativa - Argentina - Very vigorous. (R. W. Cleveland)

234443 - M. sativa - Belgium - As good as check varieties.(Starling)

255178 - M. sativa 'Varia' - Poland - Good Flemish type. (Starling)

260982 - M. sp. - Yugoslavia - Low incidence of blackstem and common leafspot - vigorous. (W. W. Washko)

- Reported by NE-9

231731 - M. falcata - (Wisc. 460) - Selections were made for Cercospora resistance. Showed resistance to blackstem.

- C. P. Wilsie, Iowa

231764 - M. sativa - New Hampshire - Hardy, fairly good forage production.

232927 - M. sativa 'Varia' - Hungary - Eleven percent winterkilled, fair forage production.

233750 - M. falcata - Italy - Fair forage production and seed production.

236606 - M. sativa - France - Very promising, very high forage production, good aftermath, but shy seeder.

244674 - M. sativa - 'Glutinosa' - India - Twelve percent winterkilled, fair forage production.

255178 - M. sativa - 'Varia' - Poland - Vigorous, good forage and seed production.

260982 - M. sp. - Yugoslavia - Thirteen percent winterkilled, fair forage production.

- Robertson, Canada

The following introductions were reported as being resistant to stem nematode:

234205 - M. sativa - 'Bam' - Iran
234673 - M. sativa - France
243223 - M. sativa - Iran
250779 - M. sativa - Afghanistan
250780 - M. sativa - Afghanistan
250936 - M. sativa - Iran
253949 - M. sativa - Afghanistan
253951 - M. sativa - Afghanistan

- Reported by W-6

Not able to cross the following introductions with M. sativa. Used Calchicine in an attempt to double the chromosome number. None are 4n. Evaluations are being continued.

253446 - M. carstiensis - Yugoslavia
253449 - M. pironae - Yugoslavia
253450 - M. pironae - Yugoslavia

- M. D. Rumbaugh, South Dakota

The following have possible resistance to Phoma herbarum but need further evaluation.

253446 - M. carstiensis - Yugoslavia
253449 - M. pironae - Yugoslavia
253450 - M. pironae - Yugoslavia

- W. M. Clement, Minnesota

d. Psoralea cinera

238353 - Australia - Fairly good forage yield but quality is questionable. Too late for good seed production in 1956. Probably it won't overwinter but it is being tested for hardiness.

- R. G. Robinson, Minnesota

e. Trifolium spp.

204521 - T. fragiferum - Turkey - Vigorous - row approximately 2' wide in 1962 - planted in 1961. Best of T. fragiferums. Makes good ground cover.

251858 - T. pratense - Italy - Early maturing but lodges badly. Not outstanding but appears to have possibility for forage.

253853 - T. pratense - Spain - Five stemmed, leafy, vigorous, many seed heads, good recovery. Most productive of Trifolium group.

- D. Carroll, Michigan

233813 - T. repens - Italy - Vigor equal to 'Pilgrim'.

- Reported by NE-9

f. Vicia spp.

170017 - V. sativa - Turkey - Good vigor and yield. Pods off ground. Resists shattering. Received as V. narbonensis but appears to be V. sativa.

193116 - V. cornigera - Australia - Good vigor and yield. Resists shattering - early.

234266 - V. cracca - New York - Overwinters at Rosemount, Minnesota. Good seed production and good ground cover. Establishment may be a problem because of low seedling vigor.
238379 - V. macracarpa - Australia - Good vigor, good yield, resists shattering - early.

- R. G. Robinson, Minnesota

3. VEGETABLES

a. Allium cepa

The following introductions were rated excellent for keeping quality:

256322 - Brazil	256327 - Brazil
256323 - Brazil	256328 - Brazil
256324 - Brazil	260793 - Germany
256325 - Brazil	262921 - U.S.S.R.
256326 - Brazil	262981 - Holland

- Reported by NE-9

b. Asparagus officinalis

261641 - Netherlands - Male and female; 5% twin seedlings. (Maryland)
263052 - U.S.S.R. - 4 percent twin seedlings, very vigorous. (Maryland)

- Reported by NE-9

c. Beta vulgaris

The following introductions are very attractive red garden beets with little zoning and high red interval color.

163182 - India
164805 - India

d. Brassica oleracea (Cauliflower)

The following introductions are being used in breeding program for possible insect resistance:

264651 - Germany	264655 - Germany
264652 - Germany	264656 - Germany
264653 - Germany	264657 - Germany
264654 - Germany	264658 - Germany

- S. A. McCrory, South Dakota

e. Citrullus vulgaris

271132 - Tunisia - Downy mildew resistant.
276444 - Jordan - Very vigorous, late. May have disease and/or drouth resistance.
276445 - Jordan - Vigorous, tough rind - fair quality. May have disease or drouth resistance.

- A. D. Hibbard, Missouri

f. Cucumis spp.

164465 - C. sativus - India - Tolerant to angular leaf spot.
169400 - C. sativus - Turkey - Partially resistant to angular leaf spot. Has value as partially resistant parent and is being crossed with SMR 15 and 18 to introduce angular leaf spot resistance.
179676 - C. sativus - India - Same as 169400 above.
234517 - C. sativus - (SC-50) - South Carolina - Tolerant to angular leaf spot.

The following introductions are tolerant to angular leaf spot:
257286 - C. sativus - Spain
257486 - C. sativus - China
264664 - C. sativus - Germany

- J. C. Walker, Wisconsin

169304 - C. sativus - Turkey - Demonstrated resistance to Verticillium wilt in preliminary tests by Dr. Skotland in Washington.

- Reported by S-9

175111 - C. sativus - India - May have powdery mildew tolerance.

- Reported by NE-9

The following two accessions contributed germ plasm to varieties 'Polaris' and 'Pixie' released in South Carolina. 'Polaris' was developed for slicing and 'Pixie' for pickling. Both varieties are highly resistant to downy mildew, powdery mildew and race 1 Anthracnose with moderate resistance to race 2.

196289 - C. sativus - India - Being used in further breeding for resistance to race 2 Anthracnose.
197087 - C. sativus - India

- Reported by S-9

200818 - C. sativus - Burma - Being used in breeding program as a source of bacterial wilt resistance.
212233 - C. sativus - South Carolina - Being used in breeding program as a source of resistance to powdery mildew.

- C. E. Peterson, Michigan

212233 - C. sativus - South Carolina - Early, productive, resistant to powdery mildew.
227208 - C. sativus - Japan - Resistant to powdery mildew and mosaic.
234517 - C. sativus - (SC-50) - South Carolina.- Fair powdery mildew resistance; firm fruit resists soil rot and melon fly.

- Reported by W-6

g. Cucumis melo

The following introductions had no bacterial wilt after beetle feeding:

125921 - Afghanistan	143248 - Iran
125938 - Afghanistan	162668 - Argentina
125945 - Afghanistan	167058 - Turkey
126113 - Afghanistan	211949 - Iran
126213 - Canada	212212 - Greece

The following had low beetle feeding:

149168 - U.S.S.R.	211116 - Israel
179248 - Turkey	

The following had low wilt infection:

212088 - Afghanistan

- L. C. Peirce, Iowa

h. Cucurbita spp.

The following 2 accessions were used in South Carolina as a source of resistance to squash mosaic virus. Seventh generation selections from crosses involving these introductions were tested in replicated yield trials and they showed a high tolerance to SMV.

135394 - C. pepo - Afghanistan
172870 - C. pepo - Turkey

169454 - C. pepo - Turkey - Seventh generation selections made from cross with 'Yellow Crookneck', 'Early Prolific Straightneck' and 'Long Cocozelle', which show high tolerance to squash mosaic virus are being tested in replicated yield trials.

The following 2 introductions are being used in breeding stocks to incorporate greater disease resistance in commercial types in Texas.

201772 - C. okeechobeensis - Florida
234616 - C. pepo - South Africa

- Reported by S-9

163229 - C. moschata - India - High total solids, fair inside color, some tolerance to mildew.
163231 - C. moschata - India - Higher than average total solids but poor color.
169441 - C. moschata - Turkey - High total solids and fair inside color.
169444 - C. moschata - Turkey - High total solids and good inside color. Plan to use in crosses in 1963.
192942 - C. moschata - China - Crossed with our inbreds, F_1 then selfed to segregate, then selfed again for further selection. Hope to obtain usable lines from these crosses.
257532 - C. moschata - Canary Island - Good flesh depth, tolerant to mildew but late maturity. Poor color, low solids.
266925 - C. pepo - Germany - Naked seed, could be used as edible nut.

- H. H. Reichman, Illinois

234616 - C. pepo - South Africa - Very vigorous bush, leaves show silver markings, characteristic of zucchini. Source of vigorous bush habit.

- Reported by NE-9

i. Daucus carota

263023 - England - Displays large size, gradual tapering, smoothness, small core, excellent color both inside and out; claimed high in carotene.

277668 - Netherlands - Medium size, good color inside and out.

- Reported by NE-9

j. Lactuca spp.

104854 - L. scariola - England - Contributed single dominant gene resistance to downy mildew to 'Calmar', a downy mildew resistant lettuce introduced by the California AES and USDA.

177418 - L. sativa - Turkey - Contains a single dominant gene for resistance to downy mildew. Used in breeding.

- Reported by W-6

The following introductions are resistant to root rot, slow bolting, slight heading:

164937 - L. sativa - Turkey
164938 - L. sativa - Turkey
164939 - L. sativa - Turkey - Also, being used in crosses with Great Lakes 659 but value of crosses has not yet been assessed, particularly in relation to root rot resistance.
171669 - L. sativa - Turkey - No heading.
222253 - L. sativa - Iran - No heading.
222254 - L. sativa - Iran - Fast bolting, no heading.

- Luis Sequeira, Wisconsin

204584 - L. sativa - Turkey - No infection in 13 plants with Eastern strain of aster yellows when inoculated with caged aphids.

- Canada results as reported by NE-9

k. Lycopersicon spp.

Further use of the introductions listed below was made in Florida in the development of 'Manapal', a disease resistant tomato with the desirable qualities of 'Rutgers'. The pedigree of 'Manapal' includes both 'Manalucie' and 'Indian River' cultivars which were developed in part from PI 79532 and 126445. 'Manapal' has the record for the highest degree of known resistance to graywall and it is equal to Rutgers in quality and productivity under a wide range of conditions.

79532 - L. pimpinellifolium - Peru
126445 - L. hirsutum - Peru

79532 - L. pimpinellifolium - Peru
(1) Contributed Stemphyllium leaf spot resistance to the variety 'Marion' released by South Carolina in 1961. May have Fusarium wilt resistance.
(2) Contributed immunity to race 1 of Fusarium lycopersici in varieties 'Mosage', 'Brookston', 'Roma' and 'Fireball'.

The following introductions appear to have adequate resistance to race 1 and 2 of Fusarium oxysporum f. lycopersici for preliminary crossing for inclusion in a breeding program. (R. E. Stall, Florida)

124039 - L. pimpinellifolium - Peru
126915 - L. esculentum x L. pimpinellifolium - Peru
211838 - L. pimpinellifolium - Peru

126409 - L. esculentum - Peru - Used in breeding program for its cracking resistance.

247089 - L. esculentum - Australia
(1) Used in breeding program for its earliness.
(2) Crossed with a number of named varieties to incorporate its earliness into the breeding program. This Australian variety, Kyi, is early, flat, rough and cracks.

- Reported by S-9

79532 - L. pimpinellifolium - Peru - Used as a parent in developing the variety 'Epoch' at Purdue - Contributed Fusarium wilt resistance. Line No. 10 used in this work was Dr. Tuckers material.

- G. W. Bohn and C. M. Tucker. Immunity to Fusarium wilt in the tomato. Science 89:603-604. 1939.

92863 - L. esculentum - Manchuria - Being tested for possible Anthracnose resistance.

- T. Toyama, Canada

The following introductions are showing resistance to leaf miner:

126431 - L. peruvianum - Peru
126436 - L. pimpinellifolium - Peru
126445 - L. hirsutum - Peru
126449 - L. hirsutum glabratum - Peru
126924 - L. pimpinellifolium - Peru
126931 - L. pimpinellifolium - Peru
127826 - L. hirsutum - Peru - Also shows resistance to the tropical mite.
127830 - L. peruvianum v. dentatum - Peru
128643 - L. peruvianum - Peru
128645 - L. peruvianum - Peru
128650 - L. peruvianum v. dentatum - Chile
128653 - L. peruvianum - Chile
128654 - L. peruvianum - Chile
128655 - L. peruvianum v. dentatum - Chile
129146 - L. peruvianum - Peru
251306 - L. peruvianum - Peru - Also shows resistance to the tropical mite.

- D. A. Wolfenbarger, Texas

The following introductions are resistant to a potent strain of the curly top virus (strain 11) and is self fertile as well.

126431 - L. peruvianum - Peru
126445 - L. hirsutum - Peru
126448 - L. glandulosum - Peru
126928 - L. peruvianum - Peru
126929 - L. peruvianum - Peru
126930 - L. peruvianum v. dentatum - Peru
126935 - L. peruvianum v. dentatum - Peru
126946 - L. peruvianum - Peru
127830 - L. peruvianum v. dentatum - Peru

- Reported by W-6

In work at Illinois, Dr. Miller found the following introductions to show indication of drought resistance:

126432 - L. pimpinellifolium - Peru
128646 - L. peruvianum - Chile
129146 - L. peruvianum - Peru
129157 - L. hirsutum v. glabratum - Ecuador

- P. M. Miller, Connecticut

126446 - Lycopersicon hirsutum - Peru - A symptomless carrier of the tobacco mosaic virus.
180723 - L. esculentum - 'Kondine Red' - Germany - Used as parent of (PI 180725('Kondine Red' x L. pimpinellifolium)) which was released as var. 'German Cherry' in Oregon in 1962.
180725 - L. pimp. x esc. - Germany - Contributed to var. 'German Cherry' as described above.

- Reported by W-6

The following introductions may be segregating for dominant-gene resistance to late blight. May be due to a single gene pair inherited in a dominant manner. Resistance to race 0 appeared in a ratio of 3:1 but the resistant individuals were killed by race 1 (M. E. Gallegly).

197159 - L. esc. x L. pimp. - Guatemala
255858 - L. esculentum - Italy

The following appear to be segregating for resistance to late blight. May be due to multiple gene resistance since the ratios of resistance to susceptibility did not fit a 3:1 ratio and since the survivors from race 0 were only partially susceptible to race 1. (M. E. Gallegly)

204587 - L. esc. x L. pimp. - Turkey - Resistance is rather low and not as great as 204996.
204997 - L. esculentum - West Virginia - Resistance is rather low and not as great as 204996.
224709 - L. pimpinellifolium - Mexico
255857 - L. esculentum - Italy - Resistance is rather low and not as great as 204996.
263716 - L. esculentum - Puerto Rico - Resistance is rather low and not as great as 204996.

The following are immune to race 0 of late blight. This line and PI 224675 carry resistance as great as or greater than 204996. PI's 198674 and 224675 were resistant to all isolates of race 0 and race 1 as were resistant individuals of 204996. However, they were susceptible to isolate 154 (Gallegly) not yet classified as to race.(M. E. Gallegly)

198674 - L. esculentum - Mexico
224675 - L. esc. x L. pimp. - Mexico

204996 - L. esc. x L. pimp. - West Virginia - Resistant to late blight. Resistance used in commercial breeding lines. PI's 198674 and 224675 also carry resistance which is as great or greater than this line. (M. E. Gallegly)

223306 - L. esculentum - Rhode Island - Provided some very promising crack resistant lines. The fruits are slightly flat and of high color. The crack resistance is transmitted to its progeny. Its one fault is that the stems are difficult to remove and this is also transmitted to its progeny.

244957 - L. esculentum - Costa Rica - Early, possible resistance to Anthracnose.

247089 - L. esculentum - Australia
(1) Appears to have characteristics for concentrated ripening, (2) Frequently used as a parent because of its earliness of maturity, well sized, firm fruits with little cracking, concentrated fruit set and possible use in mechanical harvesting. 5-6 slightly oblate fruits per pound.

250432 - L. esculentum - Czechoslovakia - An early, determinate, prolific tomato.

262175 - L. esculentum - Germany - Small fruit,crack resistant.

273445 - L. esculentum - 'Nagcarlan' - Philippines - Dr. Graham, Ontario Agric. College, found that this variety has the ability to set fruit at cool night temperatures and that he used it in breeding new varieties for the northern part of Ontario, Canada.

280060 - L. esculentum - Canada - Trellis type selection made from this accession by W. H. Lachman, Mass. May be useful in breeding work. Produces firm, well colored, globular fruits.

- Reported by NE-9

213188 - L. esculentum - T-62 sel. from 'Scarlet Globe' - Greece - Used in breeding program because of its erect plant type, fair concentration of fruit and fair fruit retention.

213189 - L. esculentum - T-1385 sel. from 'Early Chatham' - Greece - Used in breeding program for its earliness and small vine.

- L. C. Peirce, Iowa

235673 - L. esculentum - (Dr. F. O. Holmes) - Resistant to internal browning and graywall.

- H. H. Murakishi. Comparative incidence of graywall and internal browning of tomato and sources of resistance. Phytopathology 50:408-412. 1960.

255855 - L. esculentum - Italy - Medium size plant with excellent set of elongated San Marzano fruit type; 72 days from transplanting to 3 ripe fruit per plant as compared with 80 for Roma.
262175 - L. esculentum - Germany - Resistant to concentric cracking.
263000 - L. esculentum - Holland - Fairly firm fruit.

- C. Wyatt, Ohio

263720 - L. esculentum - Puerto Rico
(1) Outstanding for fruit type. Saved seed from a few plants to observe again in 1962.
(2) Excellent globe shape - very little cracking - small to medium size. Will be placed in overseas trials to determine possible adaptation to other areas.

- Bruce Root, Missouri

276326 - L. esculentum - Denmark - Early ripening fruit - should be tested in 1963.

- D. H. Dinkel, Alaska

1. Phaseolus spp.

136725 - P. vulgaris - Canada - Being used in breeding program for its moderate tolerance to bacterial wilt.
165421 - P. coccineus - Mexico - Good tolerance to common blight and bacterial wilt. Being used in breeding program.

- D. Coyne, Nebraska

175858 - P. coccineus - Turkey - Appears to be a good runner bean of diverse seed color and plant type.
203958 - P. vulgaris - New York - Probably too late for Minnesota. Made exceptionally large foliage growth for Phaseolus and held its leaves all season. Free of diseases.

- R. G. Robinson, Minnesota

269323 - P. vulgaris - Sweden - Early fruiting - Needs further evaluation.
269327 - P. vulgaris - Sweden - Early fruiting - needs further evaluation.

- D. H. Dinkel, Alaska

m. Pisum sativum

Drs. W. C. MacDonald and H. H. Marshall recently reported in the Canadian Plant Disease Survey 41:275-279, 1961, that they had completed testing 450 pea introductions for resistance to pre-emergence damping off incited by Pythium ultimum. The following pea introductions were significantly better than Lincoln at the 1-5% level:

123426 - India	171812 - Turkey	196032 - Ethiopia	210624 - 'Early
164612 - India	174922 - India	206781 - 'Alaska'	Perfection
167363 - Turkey	180702 - Germany	206800 - "	
169606 - Turkey	193843 - Ethiopia	206852 - Holland	
170669 - Turkey	195024 - Ethiopia	210587 - Holland	

196877 - Ethiopia - Dwarf, good vigor, excellent dark green foliage, very good yield, early, medium large pods, not much doubling, similar to 'Wando' but not as early or prolific.
236493 - Sweden - High ovule number per pod (12), rapid growing dwarf with short internode, early, resistant to both pea and bean mosaic; high seed number readily transmitted and conditioned by homozygous recessive gene.
269821 - England - William Massey Line 3 - Very early bearing, fully developed pods on June 18. The pods are borne in pairs at each axil; there are frequently 9 seeds per pod.

- Reported by NE-9

140165 - Afghanistan
169604 - Turkey
In a seedling test for evaluating resistance of peas to Fusarium root rot, the resistant introduction, 140165 was more stable to varying conditions than susceptible variety 'Miragreen'. PI 169604, also one of the more resistant introductions was slightly less resistant and slightly less stable than 140165.

- J. L. Lockwood. A seedling test for evaluating resistance of pea to Fusarium root rot. Phytopathology 52:557-559. 1962.

The following show promise as a source of resistance to Fusarium wilt, dry root rot, and wet root rot:
165949 - India
210586 - Wisconsin - 'Wade'

197989 - Netherlands - Carries resistance to enation mosaic.
244092 - Netherlands - Shows characteristics for 3 to 4 pods per node.
244201 - Netherlands - Has the ability to recover from enation mosaic.

- Reported by W-6

The following are tolerant to Aphanomyces eutiches where roots were infected by immersion in a zoospore suspension of A. eutiches. Root portions behind root caps were strongly attractive to the zoospores, although no correlation for relative attraction could be found between resistant and susceptible lines of peas and other species.
166159 - India
180693 - Germany

- J. L. Cunningham & D. J. Hagedorn. Attraction of Aphanomyces eutiches zoospores to pea and other plants. Phytopathology 52:616-618 - 1962.

A study was undertaken to compare an Aphanomyces eutiches susceptible variety of pea, 'Wando' with a so-called tolerant line, PI 180693 with respect to how infection of roots is initiated by zoospores and if any morphological difference exists between the two lines. Results indicate that roots of PI 180693 were not as conducive to formation of oogonia as those of 'Wando'. No other consistently apparent differences existed.

180693 - Germany

- J. L. Cunningham & D. J. Hagedorn. Penetration and infection of pea roots by zoospores of Aphanomyces eutiches. Phytopathology 52: 827-834. 1962.

n. Solanum spp.

In a test for Verticillium wilt resistance, the number of plants, as indicated, showed no symptoms.

	No. of plants
164941 - S. melongena - Turkey	5
169644 - S. melongena - Turkey	1
174362 - S. melongena - Turkey	3
179744 - S. melongena - India	1

- A. E. Thompson, Illinois

246502 - S. pennellii - Peru - Resistant to Fusarium, gray leaf spot, bacterial wilts, tobacco mosaic virus and curly top.

- E. V. Wann, Indiana