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, 1965

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

* Voting members of NC-7 Regional Technical Committee.

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS

a. Regional Station Program

(1) Physical facilities.

(a) Several large items of equipment for plant pathology use have been purchased, largely with aid of Federal funds. Included are refrigerators, dew chamber, pH meter, torsion balance, hot plate, and glove box or transfer hood.

(b) The 1957 Chevrolet pick up truck has been replaced. The body of the old truck rusted through in many places and was deteriorating. The new one will be a 3/4 ton size.

(c) With regard to personnel, a plant pathologist reported for duty on October 25, 1965. This filled the vacancy that had existed for some time.

(2) Production. The 1965 growing season is the eighteenth since the establishment of the regional station at Ames on December 1, 1947. The weather was generally good and many annual crops have performed better than they have in several years. July was very dry but relatively cool. However, early August was quite hot and the drought continued. The later annuals and other crops were irrigated, when necessary.

Winterkilling during 1964-65 was the worst in the history of the station. Practically the entire planting of perennial grasses and legumes set out in 1964 was killed. The exact cause is not known, but we did have low temperatures without snow cover during part of the winter and in March there was an accumulation of ice from several freezing rains and wet snow. This lasted for several weeks. Even so called hardy alfalfas were killed in the nursery.

The 1965 seed increases will result in an increase of about 270 items for the 1966 seed list. A comparison with the 1965 list is shown below:

Inventory of Available Crop Accessions

1964	1965-66	Increase
11,744	12,014	270

Table I. Number of Genera and Accessions of Various Crops Grown at the Regional Station in 1965.

	No. of Genera		No. of Accessions	
Crop	1964	1965	1964	1965
Grasses	25	27	552	556
Legumes	11	14	244	264
Vegetables	9	12	1080	1214
Ornamentals	7	43	28	41
Special Crops	33	38	267	272
TOTAL	85	134	2171	2347
Carryover of perennial accessions			400	18
TOTAL FOR SEASON			2571	2365

(3) Introductions received. Listed below in table II is a summary of crops received in 1965, compared with 1964:

Table II. Number of Genera and Accessions of the Various Crop Groups Received in 1964 and 1965. (See Appendix B).

Crop	No. of Genera		No. of Accessions	
	1964	1965	1964	1965
Grasses	13	9	184	44
Legumes	12	6	65	53
Vegetables	10	11	285	250
Oil and Special	3	17	25	78
Ornamentals	20	26	40	56
TOTALS	58	69	599	481

(4) Seed and Plants distributed.

Table III. Number of seed packets and plants distributed in 1964 and 1965 according to crop group. (See Appendix B for further details).

Crop	No. of packets or plants	
	1964	1965
Grasses	1479	2212
Legumes	2773	1429
Vegetables	2978	6330
Oil and Special	967	188
TOTAL PACKETS	8197	10159
Ornamentals (Plants)	1602	996
TOTAL, ALL ITEMS	9799	11155

(5) Total Seed and Plant Inventory for 1965. An inventory of accessions on hand in 1965 appears in Appendix B. A summary of that inventory appears in Table IV.

Table IV. Summary of Appendix B.

Crop	Total Active 1/1/65		Removed From Inventory 1965	Received 1965	Total Active 12/31/65	Seed list 1965	To Be Increased	Packets, Plants Distributed
	Genera	Accessions						
Grasses	46	4126	56	44	4114	3705	409	2212
Legumes	19	1865	4	53	1914	1740	174	1429
Vegetables	22	6647	58	250	6839	5833	1006	6330
Oil & Spec.	46	792	4	79	867	736	131	188
TOTALS	133	13430	122	426	13734	12014	1720	10159
*Ornamentals	84	186	9	56	233	---	---	996
TOTALS	217	13616	131	482	13967	12014	1720	11155

* Woody and herbaceous ornamentals do not appear in the published seed list. Special lists of available stock is circulated at appropriate times to interested cooperators and orders are filled from their requests.

Over 4000 hardwood cuttings were distributed to fill over 60 requests for 'Cheyenn privet, PI 107630.

(6) Seed Transfers to the National Seed Storage Laboratory. Transfers of reserve quantities of seed of valuable introductions are being made to the National Seed Storage Laboratory. The following was sent in 1965:

Corn	36 Accessions
Tomatoes	121 Accessions
TOTAL	157

Additional seed will be transferred in 1966.

(7) Plant Pathology Program. The plant pathology position which was vacant during most of the year was filled when the new pathologist reported for duty on October 25, 1965. Much of his time since reporting was spent in reading files and becoming acquainted with the regional program. Other activities included:

(1) Plans for screening carrot introductions for resistance to nemotodes. Work toward building up nematode populations in sand benches was begun, in preparation for screening.

(2) Make work plans for 1966.

(3) Help plan a new plant pathology laboratory.

More details on future plans are given in Supplement I.

During the growing season, sunflower plantings continued to be checked for Plasmopora halstedii, a responsibility given to us a few years ago. Only a few diseased plants were found and destroyed.

Also, we watched for unusual symptoms in other crops in our plantings that might be caused by disease. When necessary, plant pathologists at Iowa State University have assisted us. Nothing of any concern was found by them in material that was questioned.

As a cooperative venture among all four regional pathologists, a series of mimeographed reports was initiated under the general heading "A Summary of Reports on the Resistance of Plant Introductions to Diseases, Insects, and Nematodes". During the past year, the NE-9 pathologist assisted us with the preparation of three reports on crops for which we have primary maintenance. Reports prepared are listed below, the first three being for NC-7 crops.

Daucus carota
Allium spp.
Cucurbita spp.
Forage and Turf Grasses (NE-9)
Vigna spp. (S-9)
Selected Forage Crop and Field Crop Species (S-9)

(8) Ornamentals Crops Program. Work during the year was concerned with both herbaceous and woody ornamentals. Several genera of the former introduced by Viehmeyer of the Nebraska Station are being grown for trial. These include Dasylirion, Dianthus (2 species), Lippia and Potentilla. Shrubs and trees from Viehmeyer's domestic explorations now being grown at the Regional Station include: Amelanchier, Cercocarpus, Chamaebatieria, Clematis, Fraxinus, and Platanus.

Seed of many of Viehmeyer's wild Penstemon introductions was received, cleaned and placed in regional storage.

Cuttings of five cultivars of Taxus media were furnished by L. C. Chadwick, Ohio State University for rooting and eventual testing in the regional trials. This is the first attempt to accumulate yews for regional trial planting. The Ornamental Subcommittee at this last meeting favored regional testing of various 'hardy' Taxus selections being held at Wooster and elsewhere in the region.

(a) Release of the hardy privet 'Cheyenne'. The continued superior performance of the common privet Ligustrum vulgare PI 107630, over a period of years, prompted the Crops Research Division to release this plant introduction under the name 'Cheyenne'. This introduction has been regularily propagated by two wholesale nurseries in the North Central Region, and up to this time had not been named.

The experiences of the New Crops Research Branch and NC-7 cooperators in growing this Yugoslavian privet, which Edgar Anderson collected in 1934, have been summarized in the spring (1965) issue of the American Horticultural Magazine.

The release of 'Cheyenne' prompted requests for propagation wood from 60 commercial and public nurseries, as well as, research workers in the Northeast, North Central and Western Region. Distribution of a few plants was made in the spring, but most requests for cuttings were held for late fall distribution.

(b) Trial Plant Distribution. Thirteen ornamental species, including an ornamental crabapple, Minnesota 11AB, and one vine were made available to trial cooperators during the spring planting season. Two Longwood Garden - USDA introductions from Japan, Hydrangea paniculata, PI 235134 and Ligustrum obtusifolium, PI 235136 were included among the eleven shrubs distributed. A total of 967 plants, including 36 plants for replacement, were shipped to trial sites. Of the total, 409 plants were donated by a commercial nursery.

(c) Trial Plant Reports. Five year reports were prepared on seven shrubs and one ornamental crabapple. Cooperator annual reports of plant performance serve as a basis for these five year summaries.

(9) Public Relations. About 65 people visited the Regional Station in 1965. There were many individual visitors. The largest organized groups represented the Iowa Teachers Conservation Camp (35) and students from an Iowa State Agronomy class (14). For this latter group, the coordinator was asked to present a lecture on Plant Introduction and conduct a brief tour of the greenhouses.

b. Regional Cooperative Program. Part a of this report concerns the activities at the regional station. Part b will concern regional cooperative activities.

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

Include amounts in 1966 report

CRi 1-11 Introduction of Fruit and Vegetable Crops
CRi 1-12 Introduction of Field Crops
CRi 1-13 Introduction of Specialty Crops

$1000 Hom. Appl.

In 1965, domestic exploration was continued by the Nebraska Station in search of native plants that might be useful for ornamentals and for ground cover on highway shoulders and slopes for erosion control and for beauty. Exploration trips were made into many Southwestern and Western states, including Wyoming, Utah, Colorado, Arizona, and New Mexico. About 100 items were collected. A large part of the collection is held at the North Platte, Nebraska Station but promising materials of which the is sufficient quantity to share, has been distributed to various locations for evaluation. The Regional Station has received materials for propagation and increase for ultimate use in the regional woody ornamental trial plantings.

(2) Evaluation of New Crops for Potential Industrial Utilization. In 1965, eight new crop species were grown for the first time at the Regional Station. They are:

a/ Crambe hispanica - Erucic acid oil
b/ Glaucium arabicum - High diene oil
c/ Euphorbia lagascae - Epoxy acid oil
d/ Euphorbia lathyrus - 84% oleic acid oil
e/ Ducrosia anethifolia - Petroselinic acid oil
f/ Arctium lappa - Unusual triene
g/ Bupleurum craceum - Petroselinis acid
h/ Lappula redowshii - Drying oil, I. V. 204.
i/ Leonotic nepetaefolia
j/ Calendula arvensis
k/ Labularia nearitima
l/ Alyssum dasycarpum

Not all species produced seed or even developed into mature plants. Most species were also grown at the Kansas station with similar results.

Three species appear promising but there are disadvantages with at least two.

Crambe hispanica appears much like Crambe abyssinica except that in 1965 (one replication) it matured ten days to two weeks earlier. If this characteristic holds up in future years, it could be useful in the further development of Crambe as a crop.

Ducrosia anethifolia was very promising early in the season. It grew only 20-24 inches high, bloomed very profusely and the flowers were worked well by insects. However, it produced practically no seed. Similar performance was experienced at the Minnesota station.

Euphorbia lagascae, a source of epoxy acid oil, is being evaluated as a possible replacement for Vernonia, also a source of a similar epoxy acid oil. At Ames, two dates of planting were used with 12 and 24 inch row spacings, one replicatio of each. Early season growth and development was very good and the early planting held promise for a good seed yield. However, two problems developed as the crop neared maturity. One was that it has a very indeterminate habit of growth. The other was that just as soon as the seed capsules began to turn from a green color to tan, the dry, midday summer heat would cause them to shatter. In order to save the crop, it was pulled up by the roots, tied in bundles, covered with cheescloth and shocked in the field to mature. Seed loss was estimated to be from 20 to 30 per cent.

Estimated yield of the early planting (May 3, 1965) was 474 pounds per acre for the 12 inch rows and 330 pounds for the 24 inch rows. The late planting (June 8, 1965) yielded 326 and 121 pounds per acre respectively. This planting did not fully develop at the end of the season and it is believed that this date is too late for planting here at Ames.

The Kansas station experienced similar problems with the crop. However, they found that an April 21 planting yielded about twice as much as the April 1 planting and nearly three times as much as the May 10 planting. Row spacings used there were 6, 12, 18 and 24 inches.

Small seed increases were obtained at the Regional Station of certain other crops. However, the problem of an indeterminate growth habit prevailed.

(3) Regional Cooperative Evaluation Program.

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

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

Reported to Oakes 1/28/66

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

500 — CRi 2-1 Evaluation and Maintenance of Fruit and Nut Introductions.
5,500 — CRi 2-5 Evaluation and Maintenance of Vegetable Introductions.
5,000 — CRi 2-7 Evaluation and Maintenance of Forage and Range Plant Intro.
1,340 — CRi 2-8 Evaluation and Maintenance of Cereal Crop Introductions.
12,340

(c) State Contributing Projects. In 1965, most states in the North Central Region continued cooperation with NC-7 through various contributing projects. Annual reports of progress on all these projects were submitted to the NC-7 Technical Committee in 1965 and are contained in appendix D of the minutes of the 1965 meeting of this committee. A list of current projects is contained in appendix A of this report.

A summary of certain reports follows:

1. Alaska reported that yields of the potential new crop, Limnanthes could be obtained from 300 to at least 2100 lb/A with different accessions tested in two foot rows. L. douglasii is tolerant of weed control rates of prometryne, ipazine, solan and CIPC when applied preemergence and also seems to be tolerant of weed control rates of picloram, CDAA and tricamba when applied post emergence.

Machine harvest procedures for the crop still remain to be found. It appears that Limnanthes may have potential in Alaska as a crop.

2. Indiana reported that 12 alfalfa introductions show promise as sources of potato leafhopper resistance (See appendix C).

Samples of Medicago sativa, M. falcata and M. gaetula are being evaluated for morphalogical characteristics and physiological responses in order to group according to these characteristics. Intra and intergroup crosses will be made to associate these characteristics with performance.

3. In root rot resistance experiments at Missouri, six Lotus corniculatus introductions appear to be promising as strains for advanced agronomic evaluation and for inclusion in the breeding program (See appendix C).

4. Additional sources of resistance to leafhopper in alfalfa introductions are reported from Nebraska. (See appendix C).

c. Introductions of Special Value for 1965. On the basis of records kept on evaluation reports, it becomes evident that certain introductions have real merit due to disease or insect resistance, various plant characteristics or for other reasons. Such an introduction is considered at this station as one for which its merit or value is sufficiently substantiated, used in breeding lines or in varieties, or otherwise generally accepted by crops workers.

Listed below are several introductions considered to have special value.

1. Ligustrum vulgare, PI 107630 from Yugoslavia. This introduction was named the variety 'Cheyenne' due to its superior characteristics. It is further described in a8 in this report.

2. Cucumis sativus PI's 197087, India, and 220860, Korea, were used in developing the SC-59 cucumber at the U. S. Vegetable Breeding Laboratory, Charleston, South Carolina (See appendix C). The new variety carries high resistance to downey and powdery mildew and to race 1 anthracnose with fairly good resistance to race 2 anthracnose. It also carries good resistance to angular leafspot.

PI 197087 'Silchar' from India, was previously reported,, from several sources, as haveing resistance to anthracnose and powdery mildew. Previously, it was used as a parent in the varieties SC-50, Polaris and Pixie, all released by Soth Carolina. This line is also being used in South Carolina for developing gynoecious lines for use in producing hybrid slices and pickles, along with PI's 196289 and 220860.

220860, 'Shogoin' from Korea is of particular importance for its gynoecious sex characteristic. It was used in Michigan to develop the first commercial pickle with the gynoecious or all-female character, variety 'Spartan Dawn'.

3. Cucumis sativus PI's 197087, 196289 and 220860 are being used in developing gynoecious lines at the U. S. Vegetable Breeding Laboratory, Charleston, South Carolina. The pickles also have good tolerance to cucumber mosaic virus.

PI 196289 from India was previously reported as having resistance to anthracnose. It contributed germplasm to the varieties 'Polaris' and 'Pixie'. This accession must be grown under a ten hour day for seed production.

4. Cucumis sativus, 227208, Japan, said to have originated in China similar to variety 'Suyo'. 'Tokeyo Long Green' applied in this country to breeding lines derived from this introduction. Reported from several sources to be resistant, or partially so to powdery mildew. Also reported to show resistance to tobacco mosaic virus. It has been used in breeding lines at various locations. In Hawaii, as reported by W-6, the breeding line in which this accession is used is designated as H.A.E.S. Sel. 64-A-13, (with resistance to mildew and mosaic).

5. Cucumis sativus, 212233, Japan. In Plant Inventory No. 162, this introduction is described as the variety 'Kurume Natuhusinari', a long day cucumber bred by the triple cross between two varieties of the North-Chinese cucumbers and one of the Japonese cucumber. The white spined fruits grow about five inches long and 1.5 inches thich (at Ames it was noted to grow as long as 13 inches by 3 inches wide, light green with white spines). Very prolific, disease resistant; a vigorous grower. It was presented to this station by Dr. W. C. Barns, South Carolina in 1954.

It is reported to be highly resistant to powdery mildew, fruitful and productive. In Michigan, it was used in the breeding program as a source of powdery mildew resistance. Also, at Michigan, it showed resistance to tobacco ringspot virus in greenhouse tests, but this resistance did not hold up to a satisfactory level in the field. In Hawaii, it is used in the line, H.A.E.S. Sel. 64-A-13, described in 3c4 above.

6. Cucumis sativus, 234517, South Carolina, 'SC-50'. 'SC-50' is the result of the cross (197087 x Ashley) x Ashley. It was received at this station in 1956 from South Carolina. This line is reported to show resistance to powdery mildew, anthracnose, downey mildew, mosaic and angular leafspot. It was used in the breeding

program in Hawaii for its powdery mildew resistance and also contributed germplasm to the line H.A.E.S. 64-A-13, described above. Its resistance to angular leafspot can be considered indefinite because conflicting reports were received. In some locations resistance held up, in others it did not. In Alaska, it needs further evaluation for its earliness for outdoor culture. (In Alaska, cucumbers must be grown in plastic houses in the summer in order to obtain production).

PI 197087, used in 'SC-50', is described in 3c2/ above.

7. Lycopersicon pimpinellifolium, 79532, Peru. This introduction is already well known for its disease resistance and germplasm contributions to many breeding lines and tomato varieties. It is said to have been collected near the edge of a sugar cave field near Trujillo, Peru, in 1929. It is a conservative estimate to say that it has contributed germplasm to at least 30 varieties, because the actual number may be considerable more. It has been reported to carry resistance to Fusarium wilt, Stemphyllium leaf spot, anthracnose and perhaps others not on record here. It recently contributed germplasm to the variety 'Immokalee' released by the Florida Agricultural Experiment Station. PI 126445 also contributed.

8. Lycopersicon hirsutum. 126445, Peru. Collected in 1937 at the bottom of a dugway at 6800 feet altutude. It was reported to have resistance to an unidentified cyst nematode, early blight, leafminer and Strain 11 of curly top virus. It contributed the character for high provitamin A to the variety 'Caro Red' and was used in the variety Immokalee' along with PI 79532 described in 3c6/ above. It was also used in the varieties 'Indian River'; 'Manalucie', 'Manapal' and 'Floralou'.

9. Lycopersicon peruvianum, 128657, Peru. Perhaps this introduction is best known for its resistance to nematodes. It was reported resistant to the cotton root knot nematode. Meloidogyne incognita var. acrita and the Southern root knot nematode, Meloidogyne incognita incognita. Its resistance to the southern root knot nematode may not be as significant as its resistance to the cotton root knot nematode because this species is not usually attacked by the former. I. J. Thomason and P. G. Smith, in 1957, reported that cross, Lycopersicon esculentum (Michigan State Forcing) x L. peruvianum (PI 128657) is resistant to several Meloidogyne species. (Resistance in tomato to Meloidogyne javanica and M. incognita acrita.) Pl. Dis. Rep. 41:180-181, 1957) The U. S. Vegetable Breeding Laboratory at Charleston, South Carolina, reports that this introduction is the source of root knot nematode resistance in the variety 'Nemared'.

10. Medicago sativa, 204889, Turkey. This introduction is useful for its leafhopper resistance. This resistance was reported by the Nebraska Station where it was used in a breeding program. It contributed leafhopper resistance germplasm to the synthetic line, NS-30, along with PI's 206278 and 243224. NS-30 continued to show a high level of leafhopper resistance in 1965.

11. Medicago sativa, 206278, Turkey. The value of this introduction is also in its leafhopper resistance and it was used in a way similar to 204889 described in 3c9/ above.
10

12. Medicago sativa, 243224, Iran. This introduction also contributed to leafhopper resistance to NS-30 described in 3c9/ above. Also, some pea aphid selections were made in Minnesota.
10

13. Medicago sativa, 205329, Peru. This introduction was also reported by several sources as being resistant to leafhopper. In addition, it had good seed production. It contributed germplasm to the variety WL-304. In the North Central Region, this variety produced higher yields than Vernal, Buffalo or Ranger in certain locations in 1960, 1961, 1962 and 1963.

4. USEFULNESS OF FINDINGS:

Plant introductions continue to contribute valuable characteristics to breeding lines and release varieties, as undicated above and in appendix c, which is of ultumate value to the public and to the agricultural economy.

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

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

5. WORK PLANNED FOR NEXT YEAR:

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

Work planned for next year includes, but is not limited to the following:

a. Continue domestic exploration for native ornamentals in Nebraska and initiate native grass collection in Alaska.
b. Continue evaluation and seed increase of grass, legume, vegetable and new crop introductions. Field plantings of about 2500 introductions are planned.
c. Evaluate carrot introductions for resistance to nematodes. (See Supplement I)
d. Field evaluation of tomato introductions. (See Supplement I)
e. Field evaluation of corn introductions to stalk rot. (See Supplement I)

6. PUBLICATIONS ISSUED OR MANUSCRIPTS PREPARED DURING THE YEAR:

a. Regional Station.
Informal as well as formal publications issued in 1965 are listed below:

(1) 1965 Seed list of available introductions.

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

(3) Dodge, A. F. 1964. Five Year Report on Regional Plantings of Woody Ornamentals and Shelter Plants in the North Central Region, 1958-1962. Loose Leaf Notebook, North Central Regional Plant Introduction Station, Ames, Iowa. 20 pp., 10 maps.

(4) _____, William L. Ackerman and Harold F. Winters. 1965. Performance of Three Privet Introductions in the Upper Midwest. The American Horticultural Magazine. 44:92-98.

(5) Leppik, E. E. 1964. Mapping the World Distribution of Seed-Borne Pathogens. Proc. Int. Seed Test. Ass. 29:473-477.

(6) _____ and G. Sowell, Jr. 1964. Alternaria sesami, and Serious Seed-borne Pathogen of World Wide Distribution. FAO Plant Prot. Bul. 12:1-4.

(7) Skrdla, Willis H., Leonard J. Alexander, Gene Oakes and Albert F. Dodge. Horticultural Characters and Reaction to Two Diseases of the Lycopersicon Accessions in the North Central Region. North Central Regional Bulletin 65 (Revised). In manuscript.

b. Alaska.

D. H. Dinkel. 1964. Pre-emergence weed control in Limnanthes douglasii. 21st Research Report NCWCC, 1964.

c. Indiana.

A. J. Ullstrup. 1965. Inheritance and Linkage of a Gene Determining Resistance in Maize to an American Race of Puccinia polysora. Phytopathology 55:425-428.

d. Iowa.

R. L. Mitchell. 1965. A Look at Some New Crops in Iowa. Iowa Farm Science 20(2):3-4. August.

e. Kansas.

C. V. Hall and R. H. Painter. Insect Resistance in Cucurbita. Proposed Regional Publication (In manuscript).

f. Minnesota.

E. T. Anderson and T. S. Weir. Description of Prunus Hybrids, Selections and Varieties Grown at the University of Minnesota Fruit Breeding Farm. Proposed Regional publication (In manuscript).

g. Nebraska.

(1) D. P. Coyne and M. L. Schuster. 1965. A Genetic Study of Bacterial Wilt Tolerance in Phaseolus vulgaris crosses and the Development of Multiple Bacterial Disease Tolerance in Beans. Abstract No. 118 from ASHS Meeting, 1965.

(2) H. J. Gorz and F. A. Haskins. 1964. Occurence of o-hydroxycinnamic acid in species of Melilotus and Trigonella. Crop Science 4:193-196.

(3) W. L. Howe, W. R. Kehr, and C. O. Calkins. February, 1965. Appraisal for combined Pea Aphid and Spotted Alfalfa Aphid Resistance in Alfalfa. Res. Bul. 221. Nebraska Agricultural Experiment Station.

(4) G. R. Manglitz and H. J. Gorz. 1964. Host-Range Studies with the Sweetclover Weevil and the Sweetclover Aphid. Jour. of Econ. Ent. 57:683-687.

(5) L. C. Newell and D. E. Smika. Quality in Grass Seed. Nebraska Experiment Station. Quarterly. Iowa Press.

(6) D. E. Smika and L. C. Newell. March 1965. Irrigation and Fertilization Practices for Seed Production from Established Stands of Side-oats Grama. Nebraska Agricultural Experiment Station. Bul. 218.

h. Ohio.

Skrdla, Alexander, Oakes and Dodge. See 6a(7) above. A cooperative regional publication in manuscript to be published by the Ohio Station.

i. Wisconsin.

P. N. Patel and J. C. Walker. 1965. Resistance in Phaseolus to Halo blight. Phytopathology 55(8):889-894.

j. Publications from other regions on NC-7 primary maintence crops.

(1) T. W. Culp and M. L. Kinman. 1965. Rust on Sunflowers in the Mississippi Delta. Pl. Dis. Rep. 49:433-434.

(2) R. E. Ford and J. R. Baggett. 1965. Reactions of Plant Introduction Lines of Pisum sativum to Alfalfa Mosaic, Clover Yellow Mosaic, and Pea Streak Viruses, and to Powdery Mildew. Pl. Dis. Rep. 49:787-789.

(3) M. E. Gallegly and M. E. Marvel. 1954. Inheritance of Resistance to Tomato Late Blight. Phytopathology 44:489.

(4) D. L. Strider and T. R. Konsler. 1965. An Evaluation of the Cucurbita for Scab Resistance. Pl. Dis. Rep. 49:388-391.

7. APPROVED:

January 24, 1966
Date

C. P. Wilsie
Chairman, Technical Committee
C. P. Wilsie

January 24, 1966
Date

E. F. Frolik
Regional Administrative Adviser
E. F. Frolik

SUPPLEMENT I
NC-7 Annual Report for 1965

1965 PLANT PATHOLOGY REPORT
North-Central Regional Plant Introduction Station
Regional Project NC-7
Ames, Iowa

I. Accomplishments in 1965.

Since I just came on the job the last of October no field experiments or notes were possible this year. However, a stalk-borer was noted on several accessions of Helianthus spp., especially PI 201816. The insect did not fall into one of the common species for this area so it was turned over to Dr. Peters in Entomology. Neither he nor other entomologists in the department recognized this particular borer, so it is being grown to maturity for positive identification.

A series of greenhouse benches was filled with sand in preparation for root knot screening of the carrot accessions. Three of the benches are planted to Rutgers tomato to build up the nematode population. The sand in these three benches was obtained from Dr. Norton in Plant Pathology and contained small numbers of the Northern Root Knot Nematode, Meloidogyne hapla. When the population in these three benches reaches a high level, the sand will be mixed with sand in the other 17 benches. Rutgers tomatoes will be planted in all 20 benches until a high population is obtained; then carrot screening will begin.

II. Proposed Research in 1966.

A. Screening accessions for resistance to pests.

1. Approximately 200 accessions of Lycopersicon esculentum will be screened for resistance to Septoria leaf blight and Rhizoctonia soil rot of fruits. The leaf blight inoculations will all be done in the field with the aid of sprinklers if natural rainfall fails. Soil rot tests will be run both in the field and the laboratory. Field notes will be taken on the percentage infection, lab notes on the rate of growth of the fruit lesions.

2. Additional accessions (300) of corn will be screened in the field for resistance to stalk rot incited by Diplodia zeae. Inoculations will be timed in relation to silking dates for the different accessions.

3. Alfalfa introductions will be screened in the greenhouse for resistance to Pseudopeziza medicaginis leaf spot.

4. The entire collection of carrot introductions will be screened for resistance to the Northern Root Knot Nematode, Meloidogyne hapla, in the greenhouse. The carrots will be seeded in sand having a high population of M. hapla. Resistance or susceptibility will be based on the number and size of galls on the roots.

Dr. Norton, nematologist in the Botany and Plant Pathology Department, will assist with the disease readings.

B. Field notes will be taken on all accessions grown at Ames when, in the Pathologist's opinion, a significant disease situation exists. This might include: epiphytotics, new records of pathogen-host combinations, new geographic distribution of a pathogen, and evidence of definite resistance in an accession to a demonstrably prevalent pathogen.

C. Data retrieval system.

In the hope that some uniform system will be agreed upon - and utilized - by the entire Branch, coding will be set up for important characters of as many crops as possible. Alfalfa, corn and tomatoes will be worked on this year.

D. Compilation of at least two "Summary of Reports on the Resistance of Plant Introductions to Diseases, Insects and Nematodes" will be attempted.

APPENDIX A

NC-7 STATE CONTRIBUTING PROJECTS, 1965-66

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

2. Illinois: The Assembly, Evaluation, Seed Increase and Distribution of New Introductions and Genetic and Chromosomal Tester Stocks in Maize. Project 15-382.

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

4. Iowa: Agronomic Survey of Potential Industrial Oil and Fiber Crops for Culture in Iowa. Project 1556. Terminated in 1965.

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

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

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

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

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

10. Nebraska: Improvement of Ornamentals and Fruits for Nebraska. Proj. 20-5.

11. Nebraska: Collection of Native Plants for Use as Ornamental or Breeding Material in Western North America. Project 43-16.

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

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

APPENDIX B

Inventory and Summary of Accessions Maintained and Received through 1965.

Genera	Total Active Jan. 1 1965	Removed from Inventory 1965*	Received 1965	Total Active Dec. 31 1965	Seed List 1966	**To Be Increased	Packets Distributed.
GRASSES & FIELD CROPS							
Aegilops	142	0	0	142	110	32	13
Agropyron	187	11	0	176	168	8	30
Agrostis	107	0	1	108	92	16	4
Alopecurus	34	0	0	34	31	3	1
Apera	6	0	0	6	5	1	0
Arrhenatherum	11	0	0	11	11	0	3
Brachypodium	0	0	1	1	0	1	1
Bromus	398	3	11	406	382	24	210*
Calamagrostis	10	0	0	10	9	1	9
Cynosurus	8	0	0	8	8	0	0
Dactylis	338	13	0	325	317	8	65*
Danthonia	3	0	0	3	2	1	1
Echinochloa	23	0	0	23	16	7	20
Elymus	10	0	0	10	7	3	1
Eremopoa	2	0	0	2	2	0	0
Eremopyron	9	0	0	9	9	0	0
Euchlaena	7	0	0	7	7	0	22
Festuca	183	0	4	187	174	13	70
Guadiniopsis	1	0	0	1	1	0	0
Glyceria	5	3	0	2	0	2	0
Helictotrichon	4	0	0	4	3	1	2
Heteranthelium	3	0	0	3	3	0	0
Hordeum	8	1	0	7	7	0	0
Koeleria	7	0	0	7	6	1	2
Lolium	118	0	0	118	116	2	4
Nardus	2	0	0	2	1	1	0
Neurachne	1	0	0	1	0	1	0
Panicum	172	0	5	177	173	4	306
Pennisetum	2	0	0	2	2	0	3
Phacelurus	1	0	0	1	1	0	0
Phalaris	75	0	0	75	74	1	30
Phleum	47	0	0	47	44	3	36
Poa	49	0	0	49	49	0	56
Polypogon	2	0	0	2	1	1	0
Puccinellia	5	0	0	5	0	5	1
Schedonnardus	1	0	0	1	1	0	0
Secale	4	0	1	5	4	1	4
Setaria	106	5	3	104	95	9	113
Sorghum	21	0	10	31	27	4	21
Stipa	1	0	0	1	0	1	0
Tricholaena	2	0	0	2	2	0	0
Tridens	1	0	0	1	1	0	0
Tripsacum	1	0	0	1	0	1	0
Trisetum	4	0	0	4	3	1	2
Triticum	1	0	0	1	0	1	1
Zea--Introd.	1780	20	8	1768	1741	27	--
State O.P. Coll.	224	0	0	224	0	224	--
TOTAL ZEA	2004	20	8	1992	1741	251	1181
TOTALS:Genera-46	4126	56	44	4114	3705	409	2212

*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.

Genera	Total Active Jan. 1 1965	Removed from Inventory 1965	Received 1965	Total Active Dec. 31 1965	List 1966	**To Be Increased	Packets Distributed.
LEGUMES							
Anthyllis	1	1	0	0	0	0	3
Astragalus	36	0	0	36	22	14	12
Coronilla	22	0	1	23	14	9	4
Dalea	4	0	2	6	2	4	0
Dorycnium	1	0	0	1	0	1	0
Galega	1	0	0	1	1	0	2
Lathyrus	124	0	1	125	110	15	0
Lespedeza	23	0	0	23	23	0	8
Lotus	155	0	0	155	151	4	176
Medicago	639	2	38	675	607	68	1017
Melilotus	184	0	9	193	168	25	64
Onobrychis	47	0	0	47	47	0	9
Ononis	3	0	0	3	3	0	0
Psoralea	14	0	0	14	9	5	0
Scorpiurus	21	0	2	23	19	4	0
Tetragonolobus	12	0	0	12	10	2	0
Trifolium	448	1	0	447	427	20	75
Trigonella	129	0	0	129	127	2	58
Vicia	1	0	0	1	0	1	1
TOTALS:Genera-19	1865	4	53	1914	1740	174	1429
FRUITS & VEGETABLES							
Allium	343	11	5	337	237	100	81
Apium	49	0	0	49	49	0	59
Asparagus	53	0	0	53	25	28	5
Beta	298	0	1	299	295	4	177
Carica	0	0	3	3	0	3	3
Citrullus	1	0	2	3	0	3	1
Cucumis	465	0	15	480	449	31	101
Cucurbita	395	19	5	381	380	1	509
Daucus	296	7	5	294	206	88	148
Lactuca	268	5	0	263	239	24	23
Lycopersicon	2799	13	206	2992	2515	477	4894
Orlaya	1	0	1	2	0	2	0
Petroselinum	88	0	0	88	3	85	0
Phaseolus	36	0	0	36	0	36	33
Pisum	1272	2	6	1276	1247	29	294
Prunus	1	0	0	1	0	1	0
Pyrus	2	0	0	2	0	2	0
Rheum	7	1	1	7	4	3	0
Rubus	82	0	0	82	0	82	0
Solanum	1	0	0	1	0	1	0
Spinacia	186	0	0	186	184	2	2
Vaccinium	4	0	0	4	0	4	0
TOTALS:Genera-22	6647	58	250	6839	5833	1006	6330

APPENDIX B

Genera	Total Active Jan. 1 1965	Removed from Inventory 1965	Received 1965	Total Active Dec. 31 1965	Seed List 1966	**To Be Increased	Packets Distributed
OIL & SPECIAL							
Alyssum	0	0	1	1	1	0	0
Anethum	4	0	15	19	5	14	11
Arctium	0	0	1	1	0	1	1
Brassica	371	2	23	392	353	39	13
Briza	0	0	1	1	0	1	0
Bupleurum	0	0	1	1	0	1	2
Calendula	1	0	2	3	3	0	1
Camelina	2	0	4	6	5	1	4
Cassia	6	0	0	6	1	5	1
Chenopodium	1	0	0	1	0	1	1
Cichorium	1	0	0	1	1	0	0
Crambe	11	0	7	18	18	0	71
Crotalaria	1	0	0	1	0	1	0
Cyamopsis	5	0	0	5	0	5	0
Cynara	2	0	0	2	0	2	0
Dimorphotheca	1	0	0	1	0	1	3
Ducrosia	0	0	1	1	0	1	2
Eruca	31	0	0	31	31	0	0
Euphorbia	2	0	6	8	2	6	4
Foeniculum	2	0	0	2	2	0	2
Glaucium	0	0	1	1	1	0	1
Guizota	1	0	0	1	0	1	0
Helianthus annuus	272	2	3	273	267	6	41
H. spp.	6	0	0	6	3	3	2
Hibiscus (Kenaf)	1	0	0	1	0	1	2
Lallemantia	2	0	0	2	1	1	1
Lappula	0	0	1	1	0	1	1
Limnanthes	13	0	0	13	10	3	13
Leonotis	0	0	1	1	0	1	0
Lobularia	0	0	1	1	0	1	0
Lunaria	1	0	0	1	0	1	0
Mentha	11	0	0	11	7	4	0
Osteospermum	1	0	0	1	0	1	0
Perilla	9	0	0	9	9	0	0
Raphanus	6	0	0	6	6	0	2
Ricinus	10	0	0	10	0	10	0
Rosa	1	0	0	1	1	0	0
Rudbeckia	1	0	0	1	1	0	0
Salvia	1	0	0	1	1	0	0
Satureja	5	0	0	5	1	4	1
Sesamum	5	0	0	5	0	5	0
Sideritis	1	0	0	1	1	0	0
Solanum	0	0	9	9	0	9	0
Spergula	0	0	1	1	1	0	0
Symphytum	1	0	0	1	1	0	0
Vernonia	3	0	0	3	3	0	8
TOTALS:Genera-46	792	4	79	867	736	131	188

ORNAMENTALS

Genera	Total Active Jan. 1 1965	Removed from Inventory 1965	Received 1965	Total Active Dec. 31 1965	Use In Program	Plants Distributed - 1965
PI Abelia	1	0	0	1	H	0
Acanthopanax	1	0	0	1	H	0
Acer	1	0	2	3	H	0
Alnus	1	0	5	6	H	0
Amelanchier	1	0	0	1	GD	0
Amorpha	2	1	0	1	G	0
PI Ardisia	1	0	0	1	G	0
PI Begonia	3	0	0	3	G	0
Berberis	1	0	0	1	H	0
Betula	2	0	2	4	G	0
PI Berchemia	1	0	0	1	G	0
PI Buddlea	0	0	1	1	D	0
PI Buxus	23	0	0	23	G	4
PI Camellia	1	0	0	1	G	0
Canna	0	0	1	1	G	0
Caragana	1	0	0	1	H	0
Caryopteris	1	0	0	1	H	9
PI Celastrus	1	0	0	1	G	0
Cercidiphyllum	1	0	0	1	G	0
Chamaebatiaria	0	0	2	2	D	0
Chrysanthemum	6	0	0	6	G	0
Clematis	1	0	0	1	G	0
Coleus	23	0	1	24	H	9
Cornus	2	0	0	2	H	0
Corylus	1	0	0	1	H	2
PI Cotoneaster	5	0	0	5	P	0
PI Damnacanthus	1	0	0	1	G	0
Deutzia	1	0	0	1	H	6
Dianthus	2	0	0	2	P	20
Dirca	1	0	0	1	G	0
Elaeagnus	1	0	0	1	P	0
Elsholtzia	1	0	0	1	H	0
Erigeron	1	0	0	1	G	0
Eucommia	1	0	0	1	H	0
Euonymus	6	0	1	7	GH	0
PI Euphorbia	1	0	0	1	H	0
Forsythia	1	0	1	2	D	0
Gleditsia	1	0	0	1	H	7
PI Hedera	1	0	1	2	H	0
Hydrangea	2	0	1	3	GD	123
Hypericum	4	0	1	5	GD	130
Ilex	4	0	14	18	G	0
Iris	1	1	2	2	G	0
Jamesia	1	0	0	1	G	0
PI Kohleria	1	0	0	1	G	0
Ledum	0	0	1	1	G	0
Ligustrum	3	0	0	3	GP	80 4,000 cuttings
Lippia	1	0	0	1	G	0
Liriope	1	0	0	1	G	0
Lonicera	5	0	1	6	G	112
Lycium	1	0	0	1	G	44

APPENDIX B

Genera	Total Active Jan. 1 1965	Removed from Inventory 1965	Received 1965	Total Active Dec. 31 1965	Use In Program	Plants Distributed - 1965
Malus	2	0	3	5	DG	79
Metasequoia	1	0	0	1	G	0
PI Morus	1	0	0	1	H	0
Pachistima	3	1	0	2	G	0
PI Passiflora	1	0	0	1	H	0
Penstemon	10	0	0	10	H	0
Perephyllum	1	0	0	1	G	0
Philadelphus	3	0	1	4	GD	70
Physocarpus	1	0	0	1	GD	73
Pinus	3	0	3	6	G	0
PI Potentilla	2	1	1	2	G	0
PI Prunus	2	1	0	1	H	0
PI Pyricantha	2	1	0	1	G	0
Pyrus	2	0	0	2	H	0
Quercus	1	0	0	1	G	0
PI Rhododendron	3	0	1	4	G	0
Rosa	4	0	1	5	HD	86
Rubus	1	0	0	1	H	0
PI Salmia	1	0	0	1	G	0
PI Sambucus	1	0	0	1	DH	61
PI Scabiosa	1	0	0	1	G	0
Securinega	1	0	0	1	H	0
PI Shepherdia	3	0	0	3	DH	0
Spiraea	1	0	0	1	H	0
Stachyurus	0	0	1	1	G	0
Stephanandra	2	2	0	0	0	0
PI Strobilanthes	1	0	0	1	G	0
Styrax	1	1	0	0	0	0
Symplocos	0	0	1	1	G	0
PI Syringa	6	0	0	6	HD	8
PI Thuja	1	0	0	1	H	0
Ulmus	0	0	6	6	G	0
Weigela	0	0	1	1	D	73
TOTALS:Genera-84	186	9	56	233		996

NORTH CENTRAL REGIONAL
PLANT INTRODUCTION STATION
Ames, Iowa

Appendix C to Project NC-7 Annual Report for 1965

PROMISING PLANT INTRODUCTIONS FOR 1965

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

Many results reported herein are preliminary in nature and may be the results of only 1 seasons' observation. This should be taken into consideration because occasionally certain characteristics may or may not hold up under more intensive or exhaustive evaluation. Whenever information from published material is reported, the complete reference to the publication is given.

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

A. Cooperator Evaluations.

1. GRASSES AND FIELD CROPS

a. Bromus spp.

202534 B. sitchensis Belgium. Moderately hardy in Alaska.
251527 B. inermis Yugoslavia. Has superior winterhardiness in Alaska, vigor and seed. To be introduced into breeding program.
251681 B. inermis USSR. Has superior winterhardiness in Alaska, vigor and seed. To be introduced into breeding program.
262455 B. inermis USSR. Has superior winterhardiness in Alaska, vigor and seed. To be introduced into breeding program.

- A. C. Wilton, Alaska

b. Dactylis glomerata

262459 Russia. Winter hardy and has some resistance to rust.

- D. Anderson, Minnesota

c. Elymus spp.

294105 E. arenarius var. mollis Denmark. Winterhardy and has considerable disease resistance and large stems, Used in breeding program.

294636 E. arenarius Norway. Needs further evaluation for breeding of disease resistance.

(N.B. The above accessions are not yet available from the Regional Station.)

- A. B. Schooler, North Dakota

d. Eremopyrum spp. (Re-identified from Agropyron)

219964 E. buonapartis Afghanistan. Vigorous, many spikes, strong, moderate vegetative growth.
220568 E. buonapartis Afghanistan. Vigorous, much vegetative growth, many spikes.
239711 E. orientale Iran. Vigorous, many spikes, moderate vegetative growth.

- P. Sarkar, Canada

e. Festuca spp.

The following are winter-hardy in Alaska:

251131 F. ovina Yugoslavia
270400 F. rubra USSR

- H. J. Hodgson, Alaska

f. Panicum spp.

The following have special value for bird feed mixes because of their very attractive seed coat color:

170604 P. miliaceum Turkey
204598 P. miliaceum Turkey
207663 P. miliaceum Japan
232929 P. miliaceum Hungary

- F. K. Johnson, Minnesota

204906 P. antidotale Turkey
Winter-hardy survivors are being increased for further evaluation. So far, no other accession of this species has offered more potential at this latitude (Elsberry Mo.) than 204906. Selections have been made for further evaluation.

- W. H. Billings, Missouri

220026 P. antidotale Afghanistan. Has some winter-hardiness.
268410 P. antidotale Afghanistan. Has some fine leafy plants.
269943 P. antidotale W. Pakistan. Has some fine leafy plants, intermediate in coarseness and vigor.

- V. Hawk, SCS

g. Phalaris spp.

Phalaris canariensis. The following are considered worthy of further evaluation for their high seed production:

223396 Iran
223397 Iran
223398 Iran
250741 Iran
251390 Iran
251475 Turkey
266186 Jordan

- Montana, 1965 W-6 Technical Committee Minutes

PI 269728

Phalaris arundinacea Illinois. (Dwarf strain presented to the Regional Station by SCS). A dwarf single plant segregate is under evaluation because of a search for a dwarf or low growing reed canary grass that will provide effective ground cover and yet cause less siltation in waterways.

- M. D. Atkins, Nebraska (SCS)

h. Poa pratensis

251278 Iran. Winter-hardy and mildew resistant.

- H. J. Hodgson, Alaska

i. Sorghum bicolor

170789 Turkey. Has very early maturity.
183002 India. Late maturity, very leafy.
255744 Afghanistan. Sturdy root growth.
267424 India. Has red leaf character.
276801 Ethiopia. Late maturity, very leafy, leaves nearly clasping.
276851 Ethiopia. Early growth, vigorous, many wide leaves, stems thick but lodged badly.

- W. Oppel, Wisconsin

j. Zea mays

(1) The following accessions show resistance to Diplodia zeae:

162702 Argentina	186187 Uruguay	186231 Uruguay
163558 Guatemala	186189 Uruguay	193901 Ethiopia
164381 India	186198 Australia	200187 Israel
167962 Turkey	186210 India	210404 South Africa
172330 Australia	186224 Argentina	279022 Spain
172331 Australia	'Silver Mine Cross'	
	186229 Uruguay	

- A. L. Hooker, Illinois

(2) Had very light infection of what is either Stunt or Dwarf Mosaic of corn, based on single plot observations in 1964:

167123 - Turkey	185059 - Turkey	204793 - Turkey
167974 - Turkey	186192 - Australia	204794 - Turkey
167976 - Turkey	186193 - Africa	*213696 - Iowa
168046 - Turkey	186221 - Argentina	213712 - Iowa
173828 - Turkey	186222 - Argentina	239112 - Yugoslavia
174413 - Turkey	193433 - Roumania	257625 - Ethiopia
183762 - Turkey	195233 - Hungary	260614 - Kenya
183806 - Turkey	200189 - Israel	262479 - Russia
184285 - Yugoslavia	200287 - Yugoslavia	267169 - USSR

*213696 - 'Funks Yellow Dent'

- Tennessee, 1965 S-9 Technical Committee Minutes

(3) Worthy of further study as possible breeding material.

174418 Turkey
179132 Turkey
228182 Russia
231296 Minnesota
231301 Minnesota

- Hawaii, 1965 W-6 Technical Committee Minutes

(4) Show resistance to Helminthosporium turcicum - need further evaluation.

162700 Argentina
198899 Argentina
213698 Indiana 'Reid's Yellow Dent'
221827 South Africa 'Early King'
221845 South Africa 'Homedale'
221866 Missouri 'Boone County White', Segregating
221871 Arkansas 'Delta Prolific White'
221876 Tennessee 'Jarvis Golden Prolific'
222609 Kansas 'Midland'

- A. L. Hooker, Illinois

(5) Showed an unuaual reaction to infection by Puccinia sorghi characterized by relatively large (1-2 mm in diameter), straw colored necrotic spots, each bearing a single minute pustule in its center.

167388 Turkey
172332 Australia
185054 Turkey
198902 Argentina, segregating for straw colored necrotic spots.

217413 Iowa 'Zapalote Chico', segregating for straw colored necrotic spots.

- H. H. Kramer and A. J. Ullstrup. 1959. Preliminary evaluation of Exotic Maize Germ Plasm. Agron. Jour. 59:687-689.

(6) 186208 South Africa 'Boesman Yellow Flint'. A single dominant gene determining resistance to infection by a physiologic race of Puccinia polysora, isolated in Indiana, was found within a population of the maize accession 186208. Linkage tests indicate that this gene is located about 1.6 crossover units from the Rp_1^d locus, on chromosome 10, that governs resistance to P. sorghi. It is proposed that the physiologic race used in these studies be designated PP.9 and the gene governing resistance to this race as Rpp_9.

- A. J. Ullstrup. 1965. Inheritance and Linkage of a Gene Determining Resistance in Maize to an American Race of Puccinia polysora. Phytopathology 55:425-428.

(7) 213800 North Dakota 'Mandan Yellow Flint' contributed a purple plant type which is green at the nodes - hence, different from known purple plant types -- allelism at B or Pl is under investigation.

- R. I. Brawn, Canada

(8) Segregating for resistance to Puccinia polysora.

227938 Canary Isl.

- A. J. Ullstrup, Indiana

(9) Segregating for resistance to Puccinia sorghi.

230320 West Virginia
251885 USSR
257620 Ethiopia
262484 USSR

- A. J. Ullstrup, Indiana

(10) Segregating for resistance to leaf blights.

267173 USSR
267174 USSR
267180 USSR Moderately resistant to H. maydis.
279021 Spain Resistant to H. maydis.
279032 Spain Resistant to H. maydis.

- A. J. Ullstrup, Indiana

(11) 306329 Michigan. A white capped open-pollinated yellow dent variety, early maturity, about 85 days, originally from Hungary. Has good standability for an open-pollinated variety, Inbreds made in this line are impressive for their combining ability.

- E. C. Rossman, Michigan

(12) Shows resistance to Maize Dwarf Mosaic - need further evaluation.

163597 - Guatemala
186193 - Africa

- A. L. Hooker, Illinois

2. LEGUMES

a. Coronilla spp.

253435 C. sp. Yugoslavia. Hardy, rather variable.
274040 C. varia Iowa. SCS No. M1-4902. Hardy, rather variable.
278698 C. varia Iowa 'Emerald'. Hardy, upright, fairly uniform, good forage.

- R. W. Robertson, Canada

274040 C. varia Iowa. SCS No. M1-4902. Appears completely hardy, vigorous, fine stemmed, low growing 12 to 15 inches high. Moderate seed production. Has promise as potential ground cover for highway slopes and is being tested in this respect.

- A. G. Johnson, Minnesota

b. Lotus spp.

Have shown superiority under close clipping treatment at Elsberry, Missouri and will be retained for further evaluation.

205633 L. corniculatus France
226800 L. corniculatus Greece
226801 L. corniculatus Netherlands
231123 L. corniculatus Austria

- M. D. Atkins, SCS

Long lived high seed producing types of Lotus corniculatus but need further evaluation to determine productivity and performance in solid plantings. Yields in lb. per acre in comparison with European commercial are shown below:

		Yield in lbs./A
234670	Italy	41
246733		47
251146 (var. ciliatus)	Yugoslavia	55
251147 (var. ciliatus)	Yugoslavia	132
251827	Italy	75
European commercial		22

- J. D. Baldridge, Missouri

Appear promising as a source of root rot resistance for advanced agronomic evaluation and for inclusion in a breeding program.

251146 L. corniculatus var. ciliatus Yugoslavia
251147 L. corniculatus var. ciliatus Yugoslavia
251423 L. corniculatus Yugoslavia
251424 L. corniculatus var. ciliatus Yugoslavia
251827 L. corniculatus Italy
251828 L. corniculatus Italy

- J. D. Baldridge, Missouri

258467 L. corniculatus USSR 'Morshansk 528'. Winter-hardy and has upright growth habit.

- D. C. Anderson, Minnesota

c. Medicago spp.

Winter-hardy selections made for topcrossing and maintainer line evaluations.

170450 M. sativa Turkey
170535 M. sativa Turkey
170543 M. sativa Turkey
250740 M. sativa Iran
250976 M. sativa Yugoslavia
255178 M. sativa var. varia Poland

- W. H. Davis, Wisconsin

172984 M. sativa Turkey. Hardy, 18% winter-killed, leafy.
172989 M. sativa Turkey. 43% winter-killed, good forage production, strap-like leaves. Needs further evaluation.
222112 M. sativa Afghanistan. 42% winter-killed, good forage production. Need further evaluation.
222113 M. sativa Afghanistan. 3% winter-killed, rather stemmy, fair forage production - needs further evaluation.
231731 M. falcata (Wisc 460). Hardy, 18% winter-killed; foliage not affected by 16° of frost, leafy, vigorous.

- R. W. Robertson, Canada

NC-30, a Nebraska synthetic which has the introductions listed below in its parentage continues to show a high level of leafhopper resistance.

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

- W. R. Kehr, Nebraska

Show promise as a source of potato leafhopper resistance:

206287 M. sativa Turkey	258758 M. sat. x falcata USSR
231731 M. falcata Wisc 460	260246 M. falcata Germany
258750 M. falcata USSR	260993 M. falcata USSR
258751 M. falcata USSR	262532 M. falcata USSR
258752 M. falcata USSR	263154 M. falcata USSR
258754 M. falcata USSR	263156 M. sativa USSR

- R. L. Davis, Indiana

Have apparent resistance to leafhopper yellowing as observed during first season of growth. Had a score of 1 on a scale of 1-9; 1 best - 9, poorest.

Medicago sativa

230225 - Pennsylvania	287886 - Spain	302929 - Spain
287884 - Spain	287887 - Spain	302932 - Spain
287885 - Spain	302928 - Spain	304220 - Argentina var. 'Scantonburlo'

Medicago sativa var. 'Gaetula'

277883 - Australia 277887 - Australia

Medicago falcata

300578 - USSR

W. R. Kehr, Nebraska

253450 M. pironae Yugoslavia. Appears completely hardy, vigorous fine stemmed, low growing 12 to 15 inches high, moderate seed production. Has promise as potential ground cover for highway slopes and is being tested in this respect.

- A. G. Johnson, Minnesota

Winter survival was equal to or better than the check varieties Ranger and Vernal, during the severe winter of 1964-65. Final stands of the check varieties was 58 per cent of the original.

Medicago sativa

275350 - Afghanistan	283658 - Australia	286370 - Czech. var. 'Prerovska'
279611 - Greece	286350 - Afghanistan	

- W. R. Kehr, Nebraska

205329 M. sativa Peru. Contributed about 5% of the germplasm in variety WL-304. WL-304 is a 10 clone synthetic comprised of one selection out of an open-pollinated progeny from PI 205329. In the North Central Region it produced higher yields than Vernal, Buffalo, or Ranger in certain locations in 1960, 1961, 1962 and 1963.

- D. F. Beard, Maryland

d. Melilotus spp.

208685 M. segetalis (M. infesta) Algeria. Shows considerable resistance to the sweetclover weevil.

- G. A. Stevenson, Canada

306326 M. infesta Canada Bdn. 61-98. Considered to be a non-host for the sweetclover weevil but a host for the sweetclover aphid.

- G. R. Manglitz and H. J. Gorz. 1964. Host-Range Studies with the Sweetclover Weevil and the Sweetclover Aphid. Jour. of Econ. Ent. 57:683-687.

306326 - Has intermediate level of O-hydroxycinnamic acid. Beta-glucosidase activity present. (Name and origin of this species is given above.)

- H. J. Gorz and F. A. Haskins. 1964. Occurrence of O-Hydroxy-cinnamic Acid in Species of Melilotus and Trigonella. Crop Science 4:193-196.

e. Onobrychis viciaefolia

Outstanding for survival. It is anticipated that plants surviving this test may be used in breeding improved sainfoins for Montana.

110397 Armenia
205202 Turkey
234823 Switzerland
258772 USSR

- Montana, 1965 W-6 Technical Committee Minutes.

170582 Turkey. Fairly hardy (25% winter-kill) fair aftermath, vigor and forage production. Needs further testing.
170585 Turkey. Hardy (20% winter-killed) persistent. Very early in spring.
239960 Iran. Hardy (15% winter-killed) fairly good forage and aftermath.
258767 USSR. Hardy (18% winter-killed) leafy, good forage production and aftermath.
258768 USSR. Hardy (10% winter-killed) fair forage production, leafiness and aftermath.
258769 USSR (27% winter-killed) stemmy, open type, fair aftermath and forage production. Needs further testing.

APPENDIX C

258773 USSR. Hardy, (10% winter-killed), tall, leafy, good aftermath and fair forage production.
258774 USSR. Hardy, (12% winter-killed)tall, vigorous aftermath.
258776 USSR. (35% winter-kill) fairly good aftermath, needs further testing.
258778 USSR. (40% winter-killed) leafy, and good aftermath. Needs further testing.
263158 USSR. (22% winter-kill) not too vigorous, fairly good aftermath.
263159 USSR. (30% winter-kill) fairly vigorous, needs further testing.

- R. W. Robertson, Canada

Good winter-hardiness.

258768 USSR - fine stems, leafy
258769 USSR - late maturity, leafy, tall.
258773 USSR - late, leafy.
259493 England - good recovery after clipping.
263158 USSR - fine stems.

- Montana, 1965 W-6 Technical Committee Minutes.

f. Ononis adenotricha

226643 Iran. Considered to be a non-host for both the sweetclover weevil and sweetclover aphid.

- G. R. Manglitz and H. J. Gorz. 1964. Host-Range Studies with the Sweetclover Weevil and the Sweetclover Aphid. Jour. of Econ. Ent. 57:683-687.

g. Parochetus communis

199353 India. Considered to be a non-host for the sweetclover weevil.

- G. R. Manglitz and H. J. Gorz. 1964. Host-Range Studies with the Sweetclover Weevil and the Sweetclover Aphid. Jour. of Econ. Ent. 57:683-687.

h. Trifolium spp.

237196 T. pratense Netherlands. Vigorous and winter-hardy. Selections from this introduction were crossed with adapted mildew and northern anthracnose resistant plants in the local program. Later generations from this cross are being evaluated.

253319 T. pratense Yugoslavia. Strong vigor in spring after severe winter.

- W. K. Smith, Wisconsin

251494 T. resupinatum Iran. Early maturing strain which might be of some value as an early bee pasture.

- G. A. Stevenson, Canada

267948 T. hybridum Lebanon. Winter-hardy and vigorous.

- W. H. Davis, Wisconsin

i. Trigonella spp.

Reaction to Sweetclover Weevil and Sweetclover Aphid.

PI No.	Species	Source	Feeding Index S.C. Weevil	Damage Index S.C. Weevil
222273	T. arcuata	Iran	4.8	# 1.0
244326	T. brachycarpa	Spain	2.2	# 1.0
227677	T. monantha	Iran	4.1	# 1.0
227051	T. monspeliaca	Iran	*2.3	# 1.0
244327	T. monspeliaca	Spain	*2.5	# 1.0
251412	T. noeana	Iran	4.3	# 1.0
206284	T. spicata	Turkey	*1.7	4.0
306326	Melilotus infesta	Canada	*1.0	3.5

* A rating of 1.0 - 2.5 is considered to be a non-host, 2.6-2.9 possible host, and 3.0 to 5.0 host.

A rating of 1.0 - 1.4 is considered a non-host, 1.5 to 2.5 possible host, and 2.6 to 4.0 host.

- G. R. Manglitz and H. J. Gorz 1964. Host-Range Studies with the Sweetclover Weevil and the Sweetclover Aphid. Jour. of Econ. Ent. 57:683-687.

APPENDIX C

A report on the O-hydroxycinnamic acid and beta-glucoside activity is made in the publication referred to below. Results with a few accessions are provided herein.

PI Number	Species	Source	Total O-HCA(%)	beta glucoside activity
222273	T. arcuata	Spain	0	--
244326	T. brachycarpa	Spain	0	--
244288	T. coerulea	Spain	0	--
244289	T. corniculata	Spain	0	--
206775	T. kotschy	Turkey	0	--
227677	T. monantha	Iran	0	--
227051	T. monspeliaca	Iran	0	--
251412	T. noeana	Iran	0	--
206284	T. spicata	Turkey	0	--
226533	T. uncata	Iran	0.95	+
227394	T. anguina	Iran	1.17	+
222211	T. balansae	Afghanistan	0.68	+
Bdn 61-98	Melilotus infesta	Canada	2.35	+

- H. J. Gorz and F. A. Haskins. 1964. Occurrence of O-hydroxycinnamic Acid in Species of Melilotus and Trigonella. Crop Science 4:193-196.

3. VEGETABLES

a. Allium cepa

239633 Iran. Resistant to thrips.
249898 Portugal. Has apparent thrips resistance.
256322 Brazil. Has wide angle of leaf divergence.

- J. P. Sleesman, Ohio

b. Beta vulgaris

Show promise because of their resistance to post emergence damping off. PI 163182 is closer to a commercial type than 164805. Will be incorporated into the breeding program.

163182 India
164805 India

- A. C. Gabert, Wisconsin

c. Cucumis spp.

115935 C. sativus India. Resistant to race 2 of Powdery Mildew, Erysiphe cichoracearum.

- Proc. ASHS 47:347-356. 1946

N.B. This accession is not on inventory at this station. If anyone has seed or knows of a source, please let me know.

- W. H. Skrdla

193498 C. dipsaceus Ethiopia. Monoecious flower, vigorous vine and apparently resistant to local diseases.

- M. E. Fogleman, Kansas

Progress is being made in building up seed of gynoecious lines for use in producing hybrid slicers and pickles. PI's 194087, 196289 and 220860 were used in this material. Both types carry the same resistance as SC 59 and the pickles also have good tolerance to cucumber mosaic virus. It is planned to release some of these hybrids next year.

196289 C. sativus India
197087 C. sativus India 'Silchar'
220860 C. sativus Korea 'Shogoin'

- South Carolina, U. S. Veg. Breed. Lab. 1965. S-9 Tech. Committee Minutes.

Used in developing SC 59 slicer cucumber. SC 59 is being increased for release to seed companies. Limited supplies may go on sale for 1966 spring planting. This new variety will carry high resistance to downy and powdery mildew and to race 1 anthracnose. Resistant to race 2 anthracnose is fairly good. It also carries good tolerance to angular leafspot. PI's 197087 and 220860 contributed germplasm to this variety.

197087 C. sativus India 'Silchar'
220860 C. sativus Korea 'Shogoin'

- South Carolina, U. S. Veg. Breeding Laboratory, 1965. S-9 Technical Committee Minutes.

Resistant to powdery mildew. Used in H.A.E.S. Sel. 64-A-13 (Resistance to mildew and mosaic).

212233 C. sativus Japan
227208 C. sativus Japan 'Tokyo Long Green'
234517 C. sativus South Carolina 'SC 50'

- Hawaii, 1964 W-6 Technical Committee Minutes.

The powdery mildew resistance of these accessions, in Hawaii, appears more effective in the warmer months when daytime temperatures range from 80° to 90°.

227208 C. sativus Japan 'Tokyo Long Green'
234517 C. sativus South Carolina 'SC-50'

- J. C. Gilbert, Hawaii, 25th Annual Report of Vegetable Breeding in the U. S., Hawaii and Puerto Rico, U.S. Veg. Breeding Lab., Charleston, S.C.

d. Cucumis melo

Have monoecious flowers.

124112 India
183307 India
207659 Japan

Have concentrated fruit set.

266930 Japan
266931 Japan
136195 Canada. An early line.

- M. E. Fogleman, Kansas

e. Cucurbita spp.

Reaction to squash mosaic virus

C. pepo		Rating
135394	Afghanistan	MR-S
176536	Turkey	MR-S
C. maxima		
135351	Afghanistan	MR-S
137887	Iran	MR
143284	Iran	R-MR
265556	Ethiopia	MR
265557	Argentina	R-MR
265561	Iran	MR-S
C. moschata		
135367	Afghanistan	I-R
135371	Afghanistan	R-MR
141646	Iran	R-MR
162889	Paraguay	R

I = Immune R = Resistant
MR = Moderately Resistant S = Susceptible

- W. H. Sill, Kansas

Tolerant to scab, Cladosporium cucumerinum.

C. pepo	C. pepo (cont.)
164957 Turkey	174184 Turkey
167136 Turkey	177376 Turkey
171622 Turkey	227237 Iran
174183 Turkey	285611 Poland

- D. L. Strider and T. R. Konsler. 1965. An Evaluation of the Cucurbita for Scab Resistance. Pl. Dis. Rep. 49:388-391.

t. Daucus carota

Results of nematode tests made at Winter Haven, Texas in 1959. Two kinds of nematodes were prevalent in the soil, Meloidogyne and Aphelenchus. Eight-five accessions were evaluated but only those with a score of 1 or 2 are reported below. None had a score of "0".

PI No.	Origin	Score*
163238	India	1
169485	Turkey	1
169486	Turkey	1
169487	Turkey	2
169489	Turkey	2
171641	Turkey	2
171642	Turkey	1
171643	Turkey	2
171644	Turkey	2
171645	Turkey	2
172886	Turkey	1
172888	Turkey	2
172891	Turkey	2
172892	Turkey	2
172893	Turkey	2
172894	Turkey	1
173687	Turkey	2
173688	Turkey	1
174205	India	2
174207	India	1
174208	India	1
174828	India	1
175716	Turkey	2
175719	Turkey	2
176560	Turkey	2
176565	Turkey	2
176969	Turkey	2
176970	Turkey	2
177379	Turkey	1
177380	Turkey	1
177381	Turkey	2
177382	Turkey	2
177384	Syria	1
179275	Turkey	1
181765	Lebanon	2
181880	Turkey	1
182204	Turkey	2
182207	Turkey	1
187234	Belgium	1
187235	Belgium	1
211024	Afghanistan	2
211591	Afghanistan	2
222249	Iran	2
222723	Iran	1
225868	Denmark	2
225872	Denmark	1
226464	Iran	1

* Nematode Score: 0 = none 4 = highest infestation

- Texas

225937 Sweden. Grew to large size. Being used in carrot hybridization.

- Oregon, 1964 W-6 Technical Committee Minutes.

305443 Idaho. Selected from original introduction, 173687 Turkey, because of ornamental possibility.

305444 Idaho. Selected from original introduction, 226636 Iran, because of ornamental possibility.

Both above selections made at Parma, Idaho.

- Idaho.

g. Lycopersicon spp.

Contributed germplasm to the variety Immokalee released by the Florida Agricultural Experiment Station.

79532 L. pimpinellifolium Peru
126445 L. hirsutum Peru

- Florida

105342 L. esculentum China. Fruit small but good set and foliage cover. Small crack resistance.
119778 L. esculentum Argentina. Fruit showed some crack resistance.
174261 L. esculentum Turkey.
212408 L. pimpinellifolium Peru. Will set fruit at temperatures of 90° F. days and 80° F. nights.
224674 L. esculentum New Hampshire. Very small, determinate, will set fruit at high temperatures.
250432 L. esculentum Czechoslovakia. Small determinate vine, matures early, has uu gene and shows signs of setting fruit at high temperatures.
262162 L. esculentum Switzerland. Small determinate, fruit matures early, vines are open causing sunscald, sets fruit at high temperatures, shows signs of crack resistance.
263713 L. esculentum Puerto Rico. Indeterminate vine, fruit matures somewhat early, fruit shape small and flat.
263725 L. esculentum Puerto Rico. Determinate vine, matures the same time as Heinz 1350, shows some signs of setting fruit at high temperatures.

- R. J. Barman, Indiana

108245 L. esculentum x L. pimpinellifolium Germany. Carries a dominant gene for one type of race 1 of Phytopthora infestans. F_1 progeny of W. Va. #36 and PI 108245 crossed with 'Marglobe', 'Rutgers', 'Wisconsin 55' and 'Southland' varieties were resistant when 4 weeks old. F_2 progeny segregated 3 resistant to 1 susceptible and 2 backcrosses segregated 1:1.

- M.E. Gallegly and M.E. Marnell. 1954. Inheritance of Resistance to Tomato Late Blight. Phytopath. 44:489.

126446 L. hirsutum Peru. A clone from this accession was shown to be tolerant to a virulent yellow isolate of the tobacco mosaic virus restricting the virus to a low titre within the plant. Three recessive genes have been shown to be involved in the expression of this character. This clone was incorporated into the breeding program and selections have been made which are not only tolerant to the original virulent yellow isolate but also give segregants tolerant to Alexander's isolates 1, 3, 4 and 5 and Randall's isolate 2.

- Washington, 1964 W-6 Technical Committee Minutes.

126952 L. pimpinellifolium Peru. Late but excellent color. Ascorbic acid 49 mg/100 cc. Needs further evaluation.

190188 L. esculentum x L. pimpinellifolium Mexico. Poor color but retained for ascorbic acid content - 77 mg/100cc.

223316 L. esculentum Rhode Island. Semi-paste type - needs further evaluation.

272655 L. esculentum Guatemala. Poor color, severe cracks, but retained for ascorbic acid content - 71.6 mg/100cc.

272758 L. esculentum El Salvador. Used in breeding program for color, flavor and crack resistance.

272964 L. esculentum El Salvador. Used in breeding program because of its long paste type. ($sp^+u^+y^+$)

272975 L. esculentum El Salvador. Very long paste, shiny skin - sp^+u^+ - needs further evaluation.

273011 L. esculentum Guatemala. Used in breeding program for its excellent shape (sp, u, seg y).

279566 L. esculentum Texas. Good color, variable shape, sp u - needs further evaluation.

- E. A. Kerr, Canada

127805 L. pimpinellifolium Peru. Used for its resistance to bacterial wilt. Now used in tomato line 7341 (Resistant to bacterial wilt and root knot nematode).

- Hawaii, 1964 W-6 Technical Committee Minutes

127833 L. pimpinellifolium Peru. Used in breeding program for its anthracnose resistance.

- D. L. Doney, Ohio

Varying degrees of resistance in L. peruvianum to root knot nematode, M. incognita acrita, has been shown. In the 10 PI's listed below, a number of larvae entered the roots resulting in localized positive host response but failed to support the life cycle of the nematode. No eggs were found and few or no galls were present.

PI No.	Species	Origin	galls per gm of root
128643	L. peruvianum	Peru	2 - no eggs
128645	L. peruvianum	Chile	14 - no eggs
128650	L. peruvianum var. dentatum	Chile	0 - no eggs
128653	L. peruvianum	Chile	13 - no eggs
128654	L. peruvianum	Chile	2 - no eggs
128656	L. peruvianum	Chile	0 - no eggs
128657	L. peruvianum	Peru	8 - no eggs
128660	L. peruvianum	Peru	1 - no eggs
128661	L. peruvianum var. dentatum	Peru	40 - no eggs
128663	L. peruvianum	Peru	1 - no eggs

- 24th Annual Report, U. S. Vegetable Breeding Laboratory South Carolina.

128657 L. peruvianum Peru. Source of resistance to root knot nematode in 'Nemared' tomato variety.

- 24th Annual Report, U. S. Vegetable Breeding Laboratory South Carolina.

131881 L. esculentum Argentina. Fairly soft fruit. Average firmness recording of 5 fruits on asco firmness meter = 77. Average diameter of 5 fruit = 4.96". pH of fresh puree = 4.2. Soluble solids = 5.5.

247089 L. esculentum Australia. Rough shaped fruit and very soft. Vigorous spreading habit of growth and good foliage protection of fruit under Nebraska conditions. Leaves show "cupping". Average firmness reading of 5 fruits on asco firmness meter = 82. Average diameter = 5.84"; pH = 4.3; soluble solids = 4.7.

273445 L. esculentum Philippines. 'Nagcarlan'. Being used in physiological studies on the relation of style protrusion under different levels of available soil moisture on fruit set under high temperatures.

- D. P. Coyne, Nebraska

201773 L. esculentum Canada. 'Earlinorth' carries a recessive gene for low temperature fruit set as determined at night temperatures of 40° F.

- G. A. Kemp, Canada

224674 L. esculentum New Hampshire. Very early breeding variety.

- Plant Inventory No. 163.

231257 L. cheesmanii Galapagos Isl. Self sterile. Does not make a compatible cross when used as a female but crosses readily with L. esculentum varieties when it is used as a male. The coarse, pubescent plant type is dominant in progeny from crosses with L. esculentum varieties. It is now used in a back cross program to obtain strains with possible resistance to Septoria and Alternaria. More testing is needed.

- C. Walkof, Canada

251322 L. esculentum x L. pimpinellifolium Ecuador. Late 'Red Cherry' type.

255839 L. esculentum Italy 'San Marzano'. Long slender paste type fruit.

262934 L. esculentum USSR. Fruit small ovate, easy stemming, holds in condition for long time; concentrated ripening; heavy fruit set.

263726 L. esculentum Puerto Rico. Midseason; carries crack resistance and easy stemming.

272219 L. esculentum Italy. Variable. Possible selections for crack resistance and color. Fruit ribbed, "pepper shaped"; pink, very poor set, susceptible to Verticillium wilt.

272790 L. esculentum Guatemala. Susceptible to Septoria and Verticillium; med. late, possibly crack resistant.

280597 L. esculentum USSR. Fruit small, ovate, easy stemming, holds in condition for long time; concentrated ripening; heavy fruit set.

- L. H. Lyall, Canada

262173 L. esculentum Germany. Has thick cell wall and heavy yield. This variety produces fruits of the desired quality for the package trade. Need more evaluation as to fruit size.

- R. A. Reesor, Canada

273445 L. esculentum Philippines. 'Nagcarlan'. Good heat resistance - 2° F. better than Epoch and Porter's Pride and 4° F. better than Heinz 1350 and Sioux -- based on 50% injury point at 117° F.

- E. J. Kinbacher, Nebraska

273446 L. esculentum Philippines. 'Filipino No. 2'. Used as a parent in developing a new tomato cultivar 'Rosy Red' at Ontario Agricultural College, Guelph Ontario, Canada. Has a clean peel, crimson flesh, uniform ripening, semi-dwarf and an exterior color of rosy red. Resistant to cracking at Guelph.

- 1964 NE-9 Technical Committee Minutes.

273446 L. esculentum Philippines. 'Filipino No. 2'. Plant vigorous, indeterminate, wild and cultivated; fruit 2" x 3" flat, lobed, rough, proliferated at blossom end, 12 loculed, seedy, green area around seeds, 7-8 per cluster, late maturing; flesh red; pistils do not protrude but sets fruit in humid, rainy climate. Has resistance to late blight.

- Contributor's information.

h. Phaseolus spp.

The following accessions sharply suppressed egg production of potato leafhopper, Empoasca fabae below appropriate controls in oviposition experiments.

136741 P. vulgaris Canada
174901 P. vulgaris India
194314 P. lunatus Ethiopia

There was intermediate egg production in the following group:

151014 P. vulgaris Chile
169718 P. vulgaris Turkey
195340 P. lunatus Guatemala
207504 P. aureus Afghanistan
209051 P. lunatus Cuba
219699 P. aureus Pakistan

Only 151014 caused high mortality of females.

These tests were conducted at 24° C. in darkness after preconditioning of female leafhoppers and testing only those 3-4 eggs per day prior to testing. Females returned to Vicia faba usually return to 3-4 egg/day rate following 6 test days though some do not after exposure to certain plants.

- E. T. Hibbs, Iowa

Work at Wisconsin showed the Phaseolus introductions listed below to show resistance (hypersensitive) to both races of Pseudomonas phaseolicola, PP8 (race 1) and W_1 (race 2).

P. vulgaris
150414 - El Salvador. Contained plants with a high degree of tolerance.
P. aureus
211066 - Afghanistan
226657 - Maryland
P. aconitifolius
213014 - India
214332 - India
P. mungo
174907 - India
212615 - Afghanistan
P. calcaratus
173933 - India
247686 - Congo
P. angularis
one unnumbered line

- P.N. Patel and J.C. Walker, 1965. Resistance in Phaseolus to Halo Blight. Phytopath. 55(8):889-894.

163117 P. vulgaris India. Showed a moderately high level of tolerance to a new halo blight strain in field and greenhouse screening tests.

- D. P. Coyne, Nebraska

165078 P. vulgaris Turkey. Methods of inheritance of bacterial wilt are described. (1) In one type of cross, data suggests that susceptibility is determined primarily by 2 complementary dominant genes, the absence of either or both genes resulting in tolerance. (2) In another cross, data suggests that disease reaction was inherited quantitatively. The effect of the major genes for wilt tolerance is not expressed in this genetical background.

- D. P. Coyne and M.L. Schuster. A Genetic Study of Bacterial Wilt Tolerance in Phaseolus vulgaris Crosses and the Development of Multiple Bacterial Disease Tolerance in Beans. Abstract #118 from ASHS Meeting 1965.

i. Pisum sativum

Have tolerance to Aphanomyces euteiches.

103079 China
164669 India
206873 Wisconsin
236493 Sweden
244124 Netherlands
244272 Netherlands
261634 Spain
261636 Spain
261662 Netherlands
263031 France
263871 Greece
272187 Germany
277851 Ethiopia

Have partial tolerance to Aphanomyces euteiches.

120617	Turkey	261667	Netherlands
121977	India	263028	France
166159	India	263032	France
173059	Turkey	263034	France
180868	Turkey	269763	England
183068	India	269810	England
184129	Yugoslavia	269811	England
212916	India	272184	Germany
244100	Netherlands	280234	Ethiopia
244153	Netherlands		

- L. Carlson, Minnesota

Have resistance to AMV-52.

121977	India (P.elatius)	174919	India	193838	Ethiopia
163125	India	174921	Nepal	197044	Honduras
164148	India	174922	India	197449	Ethiopia
164758	India	175229	India	197988	Netherlands
166082	India	175230	India	197989	Netherlands
166129	India	175231	Nepal	201391	Mexico
166159	India	179722	India	227258	Iran
169608	Turkey	180701	Germany	244116	Columbia
174917	India	183068	India	272170	India v. 'Ryska'
174918	India	184131	Yugoslavia	210684	Wisconsin -(needs further testing)

- R. E. Ford and J. R. Baggett. Reactions of Plant Introduction Lines of Pisum sativum to Alfalfa Mosaic, Clover Yellow Mosaic, and Pea Streak Viruses, and to Powdery Mildew. Pl. Dis. Rep. 49:787-789. 1965.

Have resistance to powdery mildew.

142775 Mexico
142777 Mexico - segregating
222069 Afghanistan - segregating
244155 Netherlands - not retested - needs further evaluation.

- R.E. Ford and J.R. Baggett. 1965. Reactions of Plant Introduction Lines of Pisum sativum to Alfalfa Mosaic, Clover Yellow Mosaic, and Pea Streak Viruses, to Powdery Mildew. Pl. Dis. Rep. 49:787-789.

Resistant to Pea Streak Virus (P-42) but not retested. Needs further evaluation.

193845 Ethiopia
203066 Finland
212029 Iran
261677 Netherlands

- R.E. Ford and J.R. Baggett. Reactions of Plant Introduction Lines of Pisum sativum to Alfalfa Mosaic, Clover Yellow Mosaic, and Pea Streak Viruses, and to Powdery Mildew. Pl. Dis. Rep. 49:787-789. 1965.

196019 Ethiopia. Only 1 pair leaflets per leaf, flowers purple, small plant, single stem, early flowering.

- C.H. Dearborn, Alaska

4. SPECIAL CROPS

a. Camelina sativa

Have high oil content and high yield of seed.

304268 Sweden
304269 Sweden

- R. G. Robinson, Minnesota

b. Helianthus annuus

Appear to have intermediate level of resistance to rust, Puccinia helianthi.

294658 USSR 'Smena'
294660 USSR 'Ienissei'

- T. W. Culp and M. L. Kinman. 1965. Rust on Sunflowers in the Mississippi Delta. Pl. Dis. Rep. 49:433-434.

c. Orlaya grandiflora

305445 U.S.A. Selected by the Idaho Station from the original introduction, 279801, because of ornamental possibility. Selection made at Parma.