

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, 1984

1. PROJECT: NORTH CENTRAL REGIONAL PROJECT NC-7
 Introduction, Multiplication, Evaluation, Preservation, Cataloguing, Enchancing, and Utilization of Plant Germplasm.

2. COOPERATING AGENCIES AND PRINCIPAL LEADERS:

<u>Administrative Adviser</u>	R. L. Mitchell, Missouri
<u>Regional Coordinator</u>	R. L. Clark, Iowa

State Experiment Stations and Representatives

Alaska	*R. L. Taylor	Missouri	*L. E. Cavanah
Illinois	*T. Hymowitz, Chm	Nebraska	*J. H. Williams
Indiana	*J. Janick	North Dakota	*J. D. Franckowiak
Iowa	*I. T. Carlson	Ohio	*S. Z. Berry, Secy
Kansas	*C. E. Wassom	South Dakota	*R. M. Peterson
Michigan	*A. Iezzoni	Wisconsin	*W. H. Gabelman
Minnesota	*H. Pellett		

U. S. Department of Agriculture

ARS Germplasm Resources Laboratory	*G. A. White
ARS Ass't to Deputy Administrator, Germplasm	Q. Jones
ARS Area Director, Mid-Great Plains Area	P. A. Putnam
Cooperative State Research Service	S. C. Wiggins
Soil Conservation Service	*K. Blan
Northern Regional Research Center	*R. Kleiman

* Voting Members of NC-7 Technical Committee

North Central Regional Plant Introduction Station, Ames, Iowa

Research Leader and Research Plant Pathologist	R. L. Clark
Horticulturist	M. P. Widrechner
Research Entomologist	R. L. Wilson
Research Agronomist	W. W. Roath

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS

New agronomic, horticultural and industrial introductions received as new PI numbers in 1984 totalled nearly 1000 accessions. The largest increase came in the genus *Amaranthus* (405); others with significant increases were: corn (101), and alfalfa (91), and cucumber (92). In addition, 444 other accessions are in the process of becoming PI numbers, currently being held at Ames under our local inventory numbers.

As a result of our continuing process of transferring seeds to other PI Stations having priority for specific crops, we removed from our inventory almost 2000 accessions previously housed at NC-7. The largest in this group was the pea collection (1520 accessions) now maintained by NE-9 at Geneva, N.Y.)

At year's end, our current total inventory included 22,891 accessions, down from the 24,002 at the end of 1983.

The final phase of the potato exploration into Mexico was concluded in the fall of 1983 by R. W. Ross, Potato Introduction Station, Sturgeon Bay, WI.

Just over 2400 accessions were planted in the field for seed increase and/or note taking on plant traits, and nearly 2200 accessions were planted for disease and insect evaluations by the PI Station staff.

Field notes were taken on all increase plantings using a data format developed in collaboration with the Crop Advisory Committees. This data can now be entered directly into the GRIN database.

Seed samples of 3220 accessions were sent to the ISU seed lab for germination testing, under a cooperative agreement between **USDA's** National Seed Storage Lab and ISU. An additional 500 accessions were tested for germination by the PI Station staff.

Back-up seed supplies of 1237 accessions were sent to the NSSL at Fort Collins in 1984 including:

Panicum	142 accessions
Setaria	202 accessions
Medicago (perennial)	311 accessions
Me lilotus	161 accessions
Daucus	101 accessions
He lianthus	66 accessions

Cooperator evaluations have led to reports of useful germplasm in the following crops for the listed traits:

Alfalfa: resistance to Phytophthora root rot, bacterial wilt, Fusarium wilt, downy mildew races I-7 and I-8, pea aphid, spotted alfalfa aphid, Verticillium wilt, and anthracnose.

Corn: resistance to Maize Dwarf Mosaic Virus and heat.

Tomato: resistance to TMV/PVX, Fusarium oxysporum race 3, bacterial speck, anthracnose, early blight, and bacterial wilt.

Cucumber: resistance to gummy stem blight and downy mildew.

Sunflower: resistance to downy mildew race 3; Sclerotinia sclerotiorum, and Diaporthe stem canker.

More than 16,000 seed packets and plants were distributed in 1984 to scientists around the world. Some of the more commonly requested crops were:

corn	2428 packets distributed
alfalfa	1070 packets distributed
tomato	7754 packets distributed
carrot	572 packets distributed
Brassica (rape)	571 packets distributed
sunflower	1312 packets distributed

4. USEFULNESS OF FINDINGS

Germplasm maintained by this, and other, Station continues to provide valuable new genes for U. S. Agriculture through the work of cooperating scientists and PI Station personnel. The evaluation of plant introductions and the dissemination of information and seed through the NC-7 Project serves crops workers, allowing them to make use of valuable new germplasm. The maintenance and preservation of plant introductions assures a germplasm pool for present and future use.

5. WORK PLANNED FOR NEXT YEAR

The regional station will continue our program of seed acquisition, increase, preliminary evaluation, storage, and distribution of agronomic and horticultural crops; regional trials of **ornamentals**; data entry into GRIN; disease and insect evaluations; and initiate a program of agronomic research designed to resolve problems associated with germplasm maintenance.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS APPROVED DURING THE YEAR:

A partial list of publications related to evaluation and use of plant germplasm in the North Central Region is included in a supplement to this report.

7. APPROVALS:

Date

Chairman, NC-7 Technical Comm.
Jerry D. Franckowiak

Date

NC-7 Administrative Advisor
R. L. Mitchell

Supplement
to

1984 ANNUAL REPORT FOR REGIONAL PROJECT NC-7

a. Publications involving regional station staff:

- 1) Clark, R. L., and Block, C. C. 1984. Belly rot resistance in Cucumis sativus. Phytopathology **74:819**.
- 2) Jarvis, J. L., Clark, R. L., Guthrie, W. D., Berry, E. C., and Russell, W. A. 1984. The relationship between second-generation European corn borers and stalk rot fungi in maize hybrids. Maydica **29:247-264**.
- 3) Foley, D. C., and Clark, R. L. 1984. Mechanical properties of stalks of Zea mays from the Plant Introduction Collection. CropSci. **24:1116-1118**.
- 4) Clark, R. L., and Foley, D. C. 1984. Stalk rot resistance and rind strength of maize stalks from the Plant Introduction Collection. Plant Disease (accepted for publication, 10/18/84)
- 5) Wilson, R. L., Clark, R. L., and Widrlechner, M. P. 1984. A Brief History of the North Central Regional Plant Introduction Station and a List of Genera Maintained. Proc. Ia. Acad. Sci. (accepted for publication 10-15-84).
- 6) Wilson, R. L. 1984. Evaluating Amaranthus in the laboratory for resistance to fall armyworm and cabbage looper. Abstracts of Submitted Papers, North Central Branch, Entomological Society of America, No. 157.
- 7) Wilson, R. L., Wiseman, B. R., and Widstrom, N. W. 1984. Growth response of corn earworm larvae on meridic diets containing fresh and lyophilized corn silk. J. Econ. Entomol. **77:1159-1162**.
- 8) Collison, V. L., and Wilson, R. L. 1984. A comparison of honeybee races used to pollinate wild sunflowers in cages. Proc. Sunflower Res. Workshop, p. 21-22, Feb. 1, 1984.
- 9) Wilson, R. L., and Courteau, J. B. 1984. Search of plant introduction proso millets for fall armyworm resistance. J. Econ. Entomol. **77:171-173**.

b. Publications by cooperators

- California 1) Rick, C. M. 1984. Monogenic stocks -- revised list. TGC Report **34:22-37**.
- Iowa 2) Lawson, V. F., and Summers, W. L. 1984. Resistance to Pseudomonas syringae pv. tomato in Wild Lycopersicon Species. Plant Disease **68:139-141**.
- Iowa 3) Lawson, V. F., and Summers, W. L. 1984. Disease Reaction of Diverse Sources of Lycopersicon to Xanthomonas campestris pv. vesicatoria Pepper Strain Race 2. Plant Disease **68:117-119**.
- Nebraska 4) Valladares-Sanchez, N. E., Coyne, D. P., and Mumm, R. F. 1983. Inheritance and Associations of Leaf, External, and Internal Pod Reactions to Common Blight Bacterium in Phaseolus vulgaris L. J. Amer. Soc. Hort. Sci. **108:272-278**.
- Wisconsin 5) Amy, D. C., Grau, C. R. and Suleman, P. E. 1980. Occurrence of Maize Dwarf Mosaic in Wisconsin and Reaction of Sweet Corn Plant Introduction Accessions and Commercial Hybrids. Plant Disease **64:85-87**.
- Alabama 6) Cranberry, D. M., and Norton, J. D. 1980. Response of Progeny from Interspecific Cross of Cucumis melo x C. metuliferus to Meloidogyne incognita acrita. J. Amer. Soc. Hort. Sci. **105:180-183**.

Alabama

7) Norton, J. D., and Granberry, D. M. 1980. Characteristics of Progeny from an Interspecific Cross of Cucumis melo with C. metuliferus. J. Amer. Soc. Hort. Sci. 105:174-180.

Israel

8) Fallik, E., Bashan, Y., Okon, R., Cahaner, A., and Kedar, N. 1983. Inheritance and sources of resistance to bacterial speck of tomato caused by Pseudomonas syringae pv. tomato. Ann. Appl. Biol. 102:365-371.