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, 1969

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:

Administrative Adviser	E. F. Frolik, Nebraska
Regional Coordinator	W. H. Skrdla, Iowa

State Experiment Stations and Representatives

North Dakota	*G. A. Peterson, Chm.	Minnesota	*L. C. Snyder
Alaska	*R. L. Taylor	Missouri	*A. D. Hibbard
Illinois	*E. B. Patterson	Nebraska	*J. H. Williams, Sec
Indiana	*K. J. Lessman	Ohio	*M. H. Niehaus
Iowa	*I. T. Carlson	South Dakota	*R. M. Peterson
Kansas	*C. E. Wassom	Wisconsin	*W. H. Gabelman
Michigan	*C. M. Harrison		

U.S. Department of Agriculture

New Crops Research Brance	*J. L. Creech, Chief
Cooperative State Research Service	C. I. Harris
Soil Conservation Service	*M. D. Atkins
Northern Utilization Research & Dev. Div.	*W. H. Tallent
U.S. Forest Service	*D. H. Dawson
Entomology Research Division	*J. L. Jarvis, Iowa

* Voting members of NC-7 Technical Committee

North Central Regional Plant Introduction Station Staff, Ames, Iowa

Regional Coordinator	W. H. Skrdla
Horticulturist	A. F. Dodge
Plant Pathologist	R. L. Clark
Entomologist	J. L. Jarvis

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS:

a. Introductions Having Special Value.

(1) Corn

(a) Two hybrid corns were released by the Michigan Agricultural Experiment Station that contain germ plasm from PI 181842, Lebanon, in their pedigree via the inbred line, MS103. One hybrid is Michigan 568-3X, (W64A x MS103) x MS68 released in 1968. The other is Michigan 555-3X, (W64A x MS103) x MS153 released in 1969.

(b) The Illinois Agricultural Experiment Station released 47 backcross derived dent corn inbred lines, all homozygous for the $\underline{Ht}_1$ $\underline{Ht}_1$ type of genetic resistance to Helminthosporium turcicum in March of 1967. In 1968, 10 additional lines with this type of leaf blight resistance were released to the general public. Of these 57 lines, 27 were derived from PI 217407, Ladyfinger popcorn from Iowa, which contributed Ht resistance. The other 30 lines were derived from the Georgia inbred line, GE440. This inbred received its Ht resistance from the variety, Hastings Prolific from Illinois.

(c) Whole kernel lysine content was determined on inbred lines and Plant Introduction corns. The lysine values, reported in weight percent on a whole kernel basis, ranged from 0.16 to 0.45% for the inbred lines and 0.22 to 0.41% for the Plant Introduction lines. PI 217410, Papago Flour Corn from Iowa, had 0.41% lysine and 14.19% protein, but its endosperm is phenotypically opaque. (Missouri)

(d) The Illinois station reported **11 Plant Introduction** corns as being superior sources of resistance to Diplodia stalk rot. They are PI's 162702, 167962, 172330, 186189, 186198, 186210, 186229, 200187, 210404, 218167, and 279022.

(2) Alfalfa

The Farmers Forage Research Cooperative, Lafayette, Indiana, reports the release of their variety, Weevlchek, which has germ plasm from PI 231731, Medicago falcata, from Wisconsin. "Weevlchek is a high yielding variety with greater resistance to the alfalfa weevil, potato leafhopper, and bacterial wilt than other varieties currently being commercially grown in the Midwest and Southeastern United States." PI 231731 was previously reported as having a certain level of weevil resistance or tolerance.

(3) Crambe

The Indiana Agricultural Experiment Station released, in 1969, the Crambe variety 'Indy' which is an introduction of Crambe hispanica, PI 279346 from Ethiopia. Indy Crambe requires a shorter growing period than other Crambe introductions, or the variety Prophet. Thus, it may have use in a multiple crop system.

(4) Tomatoes

(a) At the Missouri Station significant differences were found in the combining ability of 11 tomato introductions for fruit quality traits. Three small fruited lines, PI's 118785, 128223, and 272709 showed superior combining ability for high Brix, high titratable acidity and low pH of fruit.

(b) At Nebraska, 3 PI tomato lines showed excellent ability to recover from repeated application of high rates of 2, 4-D sprays. These lines are PI's 129131 (Panama), 190858 (Argentina), and 203229 (Australia). These lines could be used in a selection program for 2, 4-D tolerance. Three additional lines also showed good resistance: 118778 (Brazil), 124036 (Argentina), and 272636 (Costa Rica).

(5) Raspberry

A raspberry from Finland, PI 247797, variety Anelma, will be offered for sale in 1970 by the Farmer Seed and Nursery Company, Faribault, Minnesota. The variety was evaluated for several years and will be released without genetic change. Anelma raspberry was originated by the Horticultural Research Station at Piikio, Finland. The canes are 24 to 36 inches tall, fruits are larger than Latham, early to mid-season in maturity, very hardy, apparently resistant to virus and very vigorous.

b. Accomplishments at the Regional Station.

New agronomic, horticultural, and industrial plant introductions received in 1969 totaled 730 plus 75 ornamental items for a grand total of 807 items. For seed increase and revitalization, about 2600 accessions were grown, plus about 700 carryover accessions of perennial crops. Seed packets distributed totaled 6500 plus 1082 ornamental plants, for an overall total of 7583 items distributed. Over 15,600 introductions are on the active inventory and of these, more than 13,700 are available for distribution.

Seed production of certain crops received a severe setback due to a hailstorm on September 6. Small, but very heavy hail, driven by 90 mph wind, badly damaged all crops. Seed that had natural protection by flesh and husks (tomatoes, cucumbers, pumpkins, and corn) could be salvaged. Other seed with less protection (alfalfa, various grasses, and others) was lost. We made no harvest of alfalfa because seed was lost or too badly mixed with adjacent rows.

Introductions evaluated in the field for disease resistance include 310 corn and 180 tomatoes. Hail damage eliminated the third and fourth replicates of corn. Corn accessions showing evidence of disease resistance in replicates one and two include: 213791, 218149, 218167, 219873, and 219887, resistant to Diplodia stalk rot; 217404, 217407, 217490, and 221704, resistant to smut; 214123, 221838, and 221842, resistant to rust; and 218184, 221832, and 221845, resistant to northern leaf blight. The tomato plots were also severely damaged by hail. On regrowth after the storm, PI's 129145 and 134418 appeared to be resistant to Septoria leaf spot. In a greenhouse test, 79532 and 102721 also showed promise of resistance. Because of the hail injury, readings on Rhizoctonia fruit rot could not be made. Resistance to general fruit breakdown was evident, however, in lines 129145, 129149, 129152, 134417, and 134418. These were all small-fruited, wild-type tomatoes and their small size may have caused them to escape much of the injury from hail.

Seed of 44 introductions, 17 genera of woody plants from the Skrdla-Brooks exploration in the USSR were pretreated or grown during the year. Plants of 17 Dutch elm introductions including hybrids of trees known to have resistance to DED were received. Plants of 18 elm introductions previously received from Holland and 9 other elm introductions are in test out-of-doors. One elm PI 341754, Exeter elm, has been propagated and grown for Regional trial distribution. Regional trial plantings in 13 states by 30 cooperators totaled 1052 plants of 16 items.

The entire collection of cruciferous oilseeds (434 accessions) was screened for resistance to the turnip aphid. Of the Brassica spp. screened, only PI 171538, an introduction of oilseed rape (B. napus) was resistant; it also has resistance to the green peach aphid. Alyssum dasycarpum was highly resistant to the turnip aphid and may be a non-host. False flax (Camelina sativa) was unattractive to winged aphids, but susceptible to aphid feeding.

A total of 300 introductions of corn were screened in the field for resistance to larvae of the first generation of the European corn borer. Of these, 19 showed promise as sources of resistance.

c. Domestic Exploration

On June 30, 1969, the Alaska Station completed the domestic exploration work that was sponsored by NC-7 and received support from the New Crops Research Branch. Promising materials of Agropyron, Bromus, Poa, and Festuca were collected. Seed for general distribution will be placed at the Regional Station.

On July 1, the South Dakota Station initiated a three-year domestic exploration for collecting native grasses for use in their breeding and improvement program.

d. Regional Cooperative Program

The Ohio Station assisted with the increase and evaluation of 150 new tomato introductions. The Nebraska Station continued to evaluate alfalfa introductions; the Missouri Station is evaluating trefoil introductions for root rot resistance; the Indiana Station is evaluating grass and legume introductions and the Illinois Station is evaluating corn introductions for certain diseases.

4. USEFULNESS OF FINDINGS:

Plant introductions continue to provide valuable germ plasm for plant characters, disease and insect resistance and other traits that are useful to plant breeders for developing and improving crop varieties, which benefits the general public. The evaluation of introductions and dissemination of information and seed helps to better serve crops workers. The permanent maintenance of plant introductions assures a valuable germ plasm pool for present and future use.

5. WORK PLANNED FOR NEXT YEAR:

a. Continue program of seed increase, storage, preliminary evaluation, pathology and entomology screening work, local and regional testing new crops and ornamentals and coordination of cooperative program.

b. Assist the South Dakota Station with collecting native grasses.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS PREPARED DURING THE YEAR:

a. State Station Publications

(1) Missouri

(a) Lambeth, V. N., E. F. Straten and M. L. Fields. 1966. Fruit Quality Attributes of 250 Foreign and Domestic Tomato Accessions. Missouri Agr. Exp. Sta. Res. Bul. 908, 53 pages.

(b) Ibarbia, E. A., V. N. Lambeth, G. F. Krause, and E. S. Hildebrand. 1969. Combining Ability of Tomato Lines for Fruit Quality Traits. Res. Bul. 956, Missouri Agr. Exp. Sta., June 1969.

(2) Nebraska

(a) Coyne, D. P. and O. C. Burnside. 1968. Differential Plant Injury and Yield Responses of Tomato Varieties to 2, 4-D. Res. Bul. 226, Nebr. Agr. Exp. Sta., February, 1968.

(b) Malm, N. R. 1969. Millet Improvement Program Established in Western Nebraska. Nebraska Quarterly, pp. 27-28, Spring 1969.

b. USDA Publications

(1) Higgins, J. J. and G. A. White. 1968. Vernonia anthelmintica: A potential Seed Oil Source of Epoxy Acid. II. Effects of Cultural Practices, Seed Maturity, and After-ripening Conditions on Germination. Agron. Journal 60(1):59-61.

(2) Higgins, J. J. 1968. Vernonia anthelmintica: A Potential Seed Oil Source of Epoxy Acid. I. Phenology of Seed Yield. Agron. Journal 60(1):55-58.

(3) Luginbill, Philip Jr.1969. Developing Resistant Plants--The Ideal Method of Controlling Insects. Production Research Report No. 111, USDA, ARS--14 pages, October, 1969.

(4) White, G. A. 1969. A Search for New Fiber Plants Part XII. Field Yields of Kenaf (Hibiscus cannabinus L.) Jour. of the Tech. Assoc. of the Pulp and Paper Industry. (TAPPI) 52(4):656-659.

(5) Anonymous. Meadowfoam: Beauty plus Utility. Agricultural Research, USDA, page 5, July 1969.

c. Journal Articles

(1) Indiana

Berry, C. D. and K. J. Lessman. 1969. Dehulling and Seed Germination in Vernonia anthelmintica (L) Willd. Crop Science 9:247-249 March-April.

(2) Iowa

(a) Jarvis, James L.[1] 1969. Differential Reaction of Introductions of Crambe to the Turnip Aphid and the Green Peach Aphid. Jour. of Econ. Entomol. 62(3):697-698.

(b) Jarvis, J. L.[1] 1968. Resistance in Pepper Introductions to the Green Peach Aphid. Proceedings North Cent. Br. Entomol. Soc. of Amer. 23(2):142-144.

(3) Kansas

Singh, Jarnail, J. K. Greig, and Jerry S. Weis. 1969. Endogenous Growth Regulators of Diploid and Polyploid Species of Euphorbia. Advancing Frontiers of Plant Sciences 23:177-182.

(4) Michigan

Zitter, T. A. and H. H. Murakishi. 1969. Nature of Increased Virulence in Tobacco Mosaic Virus After Passage in Resistant Tomato Plants. Phytopathology 59(11):1736-1739.

(5) Minnesota

(a) Barnes, D. K. and R. H. Ratcliffe. 1969. Evaluation of Annual Species of Medicago as Sources of Alfalfa Weevil Resistance. Crop Sci. 9(5):640-642

(b) Busbice, T. H., W. V. Campbell, J.O. Rawlings, D. K. Barnes, R. H. Ratcliffe, and C. H. Hanson. 1968. Developing Alfalfa Resistant to Alfalfa Weevil Oviposition. Crop Sci. 8(6):762-767.

(c) Krenzer, E. G., Jr. and Dale N. Moss. 1969. Carbon Dioxide Compensation in Grasses. Crop Sci.9(5):619-621.

(d) Moss, Dale N., E. G. Krenzer, Jr., and W. A. Brun. 1969. Carbon Dioxide Compensation Points in Related Plant Species. Science 164:187-188 (11 April 1969)

(e) Troyer, A. F. and Arnel R. Hallauer. 1968. Analysis of a Diallel Set of Early Flint Varieties of Maize. Crop Sci. 8:581-584 (Sept. - Oct.)

(6) Missouri

Paez, A. V., J. P. Ussary, J. L. Helm, and M. S. Zuber. 1969. Survey of Maize Strains for Lysine Content. Agron. Journ. 61(6):886-889.

(7) Nebraska

(a) Coyne, Dermot P. 1968. Correlation, Heritability, and Selection of Yield Components in Field Beans, Phaseolus vulgaris L. Proceedings Amer. Soc. for Hort. Science 93:388-396.

(b) Newell, L. C. 1968. Effects of Strain Source and Management Practice on Forage Yields of Two Warm-Season Prairie Grasses. Crop Sci. 8(2):205-210.

(8) Ohio

Cirulli Mateo and L. J. Alexander. 1969. Influence of Temperature and Strain of Tobacco Mosaic Virus on Resistance in a Tomato Breeding Line Derived from Lycopersicon peruvianum. Phytopathology 59(9):1287-1297.

[1]Regional Plant Introduction Station

(9) South Dakota

Rumbaugh, M. D. 1969. Inheritance of Foaming Properties of Plant Extracts of Alfalfa. Crop Sci. 9:438-440.

(10) Wisconsin

(a) Bingham, E. T. 1968. Transfer of Diploid Medicago spp. Germplasm to Tetraploid M. sativa L. in 4X-2X Crosses. Crop Sci. 8(6):760-762.

(b) Nath, J. and E. L. Nielsen. 1961. Identification and Chromosome Numbers of Some Bromus Species. Crop Science 1:375-376.

7. APPROVED:

January 20, 1969
Date

Glenn A. Peterson
Chairman, Technical Committee
G. A. Peterson

January 20, 1969
Date

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

MISCELLANEOUS PUBLICATIONS

1. Publications in Press or Manuscript

a. Regional Plant Introduction Station

(1) Clark, R. L. Resistance to Northern Root Knot Nematode (Meloidogyne hapla Chitwood) in Plant Introductions of Daucus carota. FAO Plant Protection Bulletin (in press).

(2) Clark, R. L. Resistance to Diplodia Stalk Rot in Plant Introduction Corn, 1966-68. (In manuscript).

(3) Dodge, A. F. A New Sweetberry Honeysuckle from Hokkaido, Japan. American Horticultural Magazine (in press).

(4) Jarvis, J. L. Relative Injury to Some Cruciferous Oilseeds by the Turnip Aphid. J. Econ. Entomol. (in press).

2. Mimeograph or Offset Publication

a. Regional Plant Introduction Station

Clark, R. L., J. L. Jarvis, S. W. Braverman, S. M. Dietz, G. Sowell, Jr., and A. J. Oakes, Jr. 1969. A Summary of Reports on the Resistance of Plant Introductions to Diseases, Nematodes, Insects, and Mites.--ZEA MAYS L. 29 pp.

b. Tomato Gentics Cooperative Report

(1) Laterrot, H. and P. Pecaut. 1969. Gene TM: New test of Alellism. TGC Report 19:14-15.

(2) Laterrot H. and P. Pecaut. 1969. Gene TM-2: New source. TGC Report 19:13-14.

3. Printed Publications. The publications listed below are primarily from other regions, but concern NC-7 primary maintenance crops.

a. Corn

(1) Josephson, L. M., S. E. Bennett, and E. E. Burgess. 1966. Methods of Artificially Infesting Corn with Corn Earworm and Factors Influencing Resistance. J. Econ Entomol. 59:1322-1324.

(2) Starks, K. J. and W. W. McMillian. 1967. Resistance in Corn to the Corn Earworm and Fall Armyworm. Part II. Types of Field Resistance to the Corn Earworm. J. Econ. Entomol. 60:920-923.

b. Cucumbers

(1) Kooistra, E. 1968. Powdery Mildew Resistance in Cucumber. Euphytica 17:236-244.

(2) Kooistra, E. 1968. Significance of the Non-appearance of Visible Disease Symptoms in Cucumber (Cucumis sativus L.) After Infection with Cucumis Virus 2. Euphytica 17:136-140.

(3) Station Staff. 1967. Research Report, 1967. Research Station, Ottawa, Ontario, Canada, Canada Dept. of Agric. pp. 417-441.

c. Lettuce (Until recently, NC-7 had priority for Lactuca species)

(1) Ryder, E. J. Evaluation of Lettuce Varieties and Breeding Lines for Resistance to Common Lettuce Mosaic. Tech. Bul. 1391, USDA, ARS, 8 pages.

d. Tomatoes

(1) Angell, F. F., B. A. Twigg, and Dorothy A. Eikes. 1968. Processing Tomato Variety Trials-1968. Misc. Publ. No. 692, Md. Agr. Exp. Station, 14 pp.

(2) Barksdale, T. H. 1969. USDA-CRD Resistance of Tomato Seedlings to Early Blight. Phytopathology 59:443-446.

(3) Martin, M. W. and P. E. Thomas. 1969. CS, A New Tomato Breeding Line Resistant to Curly Top Virus. Phytopathology 59(11):1754-1755.

(4) Thyr, B. D. 1969. Additional Sources of Resistance to Bacterial Canker of Tomato (Corynebacterium michiganense) PDR 53(3):234-237.

Inventory and Summary of Accessions Maintained and Received through 1969.

Genera	Total Active Jan. 1 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Seed List 1970	**To Be Increased	Packets Distributed
GRASSES & FIELD CROPS							
Aegilops	163	0	0	163	160	3	30
Agropyron	181	0	0	181	168	13	0
Agrostis	132	0	2	134	120	14	54
Alopecurus	44	0	0	44	33	11	1
Apera	6	0	0	6	5	1	2
Arrhenatherum	14	0	0	14	14	0	0
Avena	1	0	0	1	0	1	2
Boissiera	1	0	0	1	1	0	1
Brachypodium	6	0	0	6	0	6	0
Bromus	532	4	20	548	475	73	118
Calamagrostis	18	0	0	18	10	8	0
Clinelymus	0	0	2	2	0	2	0
Cynosurus	8	0	0	8	8	0	0
Cyperus	0	0	1	1	0	1	0
Dactylis	415	0	0	415	385	30	0
Danthonia	1	0	0	1	0	1	8
Deschampsia	0	0	1	1	0	1	0
Echinochloa	24	0	0	24	20	4	11
Eremopoa	3	0	0	3	2	1	1
Eremopyrum	12	0	0	12	12	0	4
Eriachne	1	0	0	1	0	1	0
Euchlaena	39	39	0	0	0	0	42
Festuca	202	0	0	202	192	10	32
Gaudiniopsis	1	0	0	1	1	0	1
Glyceria	4	0	0	4	1	3	0
Helictotrichon	6	0	0	6	5	1	8
Heteranthelium	5	0	0	5	3	2	1
Hordeum	7	0	0	7	7	0	0
Koeleria	9	0	0	9	6	3	1
Lasiagrostis (Stipa)	1	0	0	1	1	0	0
Lolium	129	0	0	129	121	8	19
Milium	2	0	0	2	0	2	0
Nardus	4	0	0	4	2	2	1
Neurachne	1	0	0	1	0	1	0
Panicum	232	0	3	235	200	35	46
Phalaris	76	0	0	76	75	1	59
Phleum	48	0	0	48	48	0	2
Poa	51	0	0	51	50	1	3
Polypogon	13	0	0	13	12	1	4
Puccinellia	3	0	0	3	0	3	0
Schedonnardus	1	0	0	1	1	0	2

* 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 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Seed List 1970	**To Be Increased	Packets Distributed
Secale	5	1	0	4	4	0	1
Setaria	152	1	5	156	140	16	37
Sorghum	31	0	0	31	29	2	1
Stipa	1	0	0	1	0	1	0
Tetrachne	0	0	1	1	0	1	1
Tricholaena	2	0	1	3	2	1	2
Tridens	2	0	0	2	2	0	3
Tripsacum	2	0	0	2	2	0	4
Triticum	1	0	0	1	1	0	0
Urochloa	0	0	1	1	0	1	0
Zea mays--Introd.	1848	2	98	1944	1877	67	2241
St. O.P. Coll.	259	0	0	259	259	0	---
TOTAL ZEA MAYS	2107	2	98	2203	2136	67	2241
TOTALS:Genera-52	4699	47	135	4787	4454	333	2743
LEGUMES							
Astragalus	62	0	0	62	45	17	2
Coronilla	45	1	6	50	30	20	40
Dalea	9	0	0	9	2	7	1
Desmodium	0	0	0	0	0	0	1
Dorycnium	1	0	0	1	1	0	0
Galega	12	0	0	12	4	8	2
Genista	2	0	0	2	2	0	0
Glycyrrhiza	1	0	0	1	0	1	0
Lathyrus	282	0	5	287	159	128	6
Lespedeza	31	0	5	36	26	10	42
Lotus	176	0	5	181	165	16	12
Madia	1	0	0	1	0	1	0
Medicago	794	0	45	839	765	74	286
Melilotus	298	1	227	524	230	294	35
Onobrychis	79	1	0	78	65	13	19
Ononis	6	0	0	6	5	1	1
Psoralea	21	0	0	21	15	6	1
Scorpiurus	44	0	1	45	26	19	0
Tetragonolobus	19	0	1	20	15	5	9
Trifolium	462	0	0	462	458	4	4
Trigonella	150	3	7	154	138	16	8
TOTALS:Genera-21	2495	6	302	2791	2151	640	469

Genera	Total Active Jan. 1 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Seed List 1970	**To Be Increased	Packets Distributed
FRUITS & VEGETABLES							
Allium	200	0	0	200	180	20	2
Apium	58	0	0	58	56	2	0
Asparagus	54	0	0	54	26	28	6
Beta	299	1	2	300	300	0	7
Carica	3	0	0	3	0	3	0
Caucalis	0	0	1	1	0	1	0
Citrullus	2	0	0	2	0	2	0
Cucumis	511	14	40	537	483	54	257
Cucurbita	452	3	8	457	410	47	99
Daucus	347	11	24	360	240	120	177
Fragaria	2	0	0	2	0	2	0
Lycopersicon	3132	0	139	3271	3050	221	1282
Orlaya	1	0	1	2	0	2	0
Petroselinum	93	1	2	94	31	63	5
Pisum	1282	0	0	1282	1260	22	220
Rheum	7	0	0	7	4	3	0
Rubus	84	0	0	84	84	0	0
Solanum	1	0	0	1	0	1	0
Spinacia	189	0	5	194	185	9	30
Vaccinium	3	0	0	3	3	0	0
TOTALS: Genera-20	6720	30	222	6912	6312	600	2085
OIL & SPECIAL							
Adonis	1	0	1	2	0	2	1
Alyssum	1	0	0	1	1	0	1
Ammi	1	0	1	2	1	1	0
Anethum	71	23	2	50	17	33	0
Arctium	1	0	0	1	1	0	0
Atractylis	0	0	1	1	0	1	0
Berteroa	2	0	0	2	2	0	0
Bifora	0	0	1	1	0	1	0
Biscutella	1	0	0	1	0	1	0
Brassica	489	4	0	485	397	88	207
Briza	4	0	0	4	0	4	0
Bupleurum	1	0	1	2	0	2	0
Calamintha	1	0	0	1	1	0	0
Calendula	3	0	0	3	2	1	1
Caltha	1	0	0	1	0	1	0
Camelina	8	0	0	8	7	1	3
Cardamine	1	0	0	1	0	1	0
Cassia	6	0	0	6	1	5	0
Cephalaria	0	0	2	2	0	2	0
Chamaepeuce	1	0	0	1	0	1	0
Chenopodium	3	0	0	3	0	3	1
Christolea	1	0	0	1	0	1	0
Chrysanthemum	1	0	0	1	0	1	0
Cichorium	2	0	0	2	2	0	0
Cnicus	1	0	0	1	1	0	0

APPENDIX B

Genera	Total Active Jan. 1 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Seed List 1970	**To Be Increased	Packets Distributed
Crambe	39	0	1	40	24	16	35
Crepis	1	0	1	2	1	1	0
Crotalaria	1	0	0	1	0	1	0
Cyamopsis	5	0	0	5	0	5	1
Cynara	2	0	0	2	0	2	0
Daucus	0	0	1	1	0	1	0
Dimorphotheca	1	0	0	1	1	0	0
Ducrosia	1	0	0	1	1	0	0
Echinacea	1	0	0	1	0	1	0
Echium	2	0	0	2	2	0	0
Eruca	32	0	0	32	32	0	2
Eryngium	1	0	4	5	0	5	0
Euphorbia	11	0	1	12	6	6	0
Foeniculum	3	0	0	3	2	1	0
Glaucium	1	0	0	1	1	0	0
Goldbachia	0	0	1	1	0	1	0
Guizotia	1	0	0	1	0	1	0
Helenium	1	0	0	1	1	0	0
Helianthus annuus	289	1	45	333	280	53	898
Helianthus sp.	10	0	0	10	2	8	8
Heracleum	2	0	0	2	0	2	0
Hibiscus (Kenaf)	1	0	0	1	1	0	2
Iberis	2	0	0	2	0	2	2
Impatiens	2	0	0	2	0	2	0
Isatis	0	0	2	2	0	2	0
Lallemantia	2	0	0	2	1	1	0
Lappula	2	0	0	2	0	2	0
Lapsana	2	0	1	3	1	2	0
Leonotis	1	0	0	1	0	1	0
Lepidium	1	0	0	1	1	0	1
Limnanthes	17	0	0	17	17	0	22
Limnosciadium	0	0	1	1	0	1	0
Lobularia	1	0	0	1	0	1	1
Lunaria	1	0	0	1	0	1	0
Mentha	11	0	0	11	7	4	9
Monarda	4	0	0	4	2	2	0
Mosla	1	0	0	1	1	0	0
Oenothera	1	0	0	1	0	1	0
Onosma	1	0	0	1	0	1	0
Osteospermum	1	0	0	1	0	1	0
Perilla	9	0	0	9	9	0	0
Petroselinum	1	0	0	1	0	1	0
Picris	3	0	0	3	0	3	0
Prionosciadum	0	0	1	1	0	1	0
Raphanus	8	0	0	8	8	0	6
Rhaponticum	1	0	1	2	0	2	0
Ricinus	10	0	0	10	0	10	0
Rochelia	1	0	0	1	1	0	0
Rudbeckia	1	0	0	1	1	0	0
Satureja	6	0	0	6	3	3	1
Schlechtendalia	2	0	0	2	0	2	0

APPENDIX B

Genera	Total Active Jan. 1 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Seed List 1970	**To Be Increased	Packets Distributed
Sesamum	5	0	0	5	0	5	0
Sideritis	2	0	0	2	1	1	0
Sigesbeckia	1	0	0	1	1	0	0
Sisymbrium	1	0	0	1	0	1	0
Spergula	1	0	0	1	1	0	0
Stenachaenium	1	0	1	2	0	2	0
Symphytum	1	0	0	1	1	0	0
Tephrosia	2	0	0	2	0	2	0
Thalictrum	2	0	0	2	1	1	0
Thlaspi	1	0	0	1	1	0	0
Trachyspermum	1	0	0	1	0	1	0
Vaccaria	1	0	0	1	1	0	0
Vernonia	3	0	1	4	3	1	2
TOTALS:Genera-89	1120	28	71	1163	849	314	1204

Genera	Total Active Jan. 1 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Plants Distributed 1969
ORNAMENTALS					
PI Abelia	1	1	0	0	0
Abeliophyllum	1	0	0	1	0
PI Abies	2	0	0	2	0
PI Acer	5	1	0	4	0
PI Aconitum	1	1	0	0	0
PI Actinidia	2	0	0	2	0
PI Agapanthus	1	0	0	1	0
PI Alnus	5	0	1	6	0
PI Amelanchier	5	0	0	5	0
Amorpha	3	0	0	3	0
PI Ardisia	1	0	0	1	0
PI Armeria	1	0	0	1	0
PI Aronia	1	0	0	1	0
PI Aruncus	0	0	1	1	0
PI Begonia	4	0	0	4	0
PI Belamcanda	1	0	0	1	0
Berberis	1	0	0	1	0
PI Betula	5	0	1	6	44
Buddleia	1	0	0	1	0
Buxus	22	0	0	22	0
PI Callicarpa	0	0	2	2	0
PI Camellia	1	0	0	1	0
Caragana	2	0	0	2	0
PI Carica	3	0	0	3	0
PI Carpinus	1	0	0	1	0
Caryopteris	1	0	0	1	0
Castanea	1	0	1	2	0
Celastrus	1	0	1	2	89
PI Cercocarpus	2	0	1	3	0
Chaenomeles	0	0	1	1	81
PI Chamaebataria	3	0	0	3	0
PI Chrysanthemum	8	0	0	8	0
PI Clematis	2	0	0	2	0
PI Clethra	0	0	1	1	0
PI Coleus	22	0	0	22	0
PI Colutea	1	0	0	1	0
PI Cornus	15	0	0	15	0
PI Cotoneaster	21	0	0	21	0
PI Cowania	1	0	0	1	0
PI Crataegus	8	0	0	8	77
PI Cytisus	4	0	1	5	0
PI Damnacanthus	1	0	0	1	0
PI Dasylirion	1	0	0	1	0
PI Deutzia	2	0	1	3	0
PI Dianthus	8	0	0	8	0
PI Dierama	1	0	0	1	0
Dirca	1	0	0	1	0
PI Duchesnea	2	0	0	2	0
Elaeagnus	2	0	0	2	0
Elsholtzia	1	0	0	1	0

Genera	Total Active Jan. 1 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Plants Distributed 1969
PI Eucommia	1	0	0	1	0
PI Euonymus	12	0	0	12	0
PI Euphorbia	1	0	0	1	0
PI Fendlera	0	0	1	1	0
PI Foresteria	1	0	0	1	0
PI Forsythia	2	0	0	2	0
Fothergilla	1	0	0	1	24
PI Fraxinus	2	0	0	2	0
PI Gaultheria	1	0	0	1	0
PI Genista	2	0	0	2	0
Gleditsia	1	0	0	1	0
PI Haemanthus	1	0	0	1	0
PI Hedera	2	0	1	3	0
Helianthilla	1	0	0	1	0
PI Hemiptelea	1	0	0	1	0
Hippophae	1	0	0	1	0
PI Hydrangea	2	0	0	2	0
PI Hypericum	8	0	0	8	0
PI Ilex	29	0	5	34	0
Indigofera	1	0	0	1	0
PI Iris	4	2	5	7	0
PI Jamesia	1	1	0	0	0
PI Juglans	1	0	0	1	0
PI Juniperus	4	0	1	5	151
PI Kohleria	1	0	0	1	0
PI Lavatera	1	1	0	0	0
PI Ledum	1	0	0	1	0
PI Ligustrum	8	0	1	9	0
PI Lilium	0	0	1	1	0
PI Lindera	0	0	1	1	0
PI Lippia	1	0	0	1	0
Lonicera	6	0	3	9	0
PI Lycium	1	0	0	1	0
Lythrum	1	0	0	1	0
PI Maackia	2	0	0	2	0
Malus	8	0	0	8	0
Medicago	1	0	0	1	0
PI Metasequoia	1	0	0	1	0
Mimulus	1	0	0	1	0
PI Morus	1	0	0	1	0
PI Orlaya	0	0	1	1	0
Ostrya	0	0	1	1	0
Pachistima	1	0	0	1	0
PI Passiflora	1	0	0	1	0
Penstemon	10	0	0	10	0
PI Pera phyllum	1	0	0	1	0
PI Pelargonium	0	0	1	1	0
PI Philadelphus	6	0	0	6	0
Photinia	1	0	1	2	0
Physocarpus	1	0	0	1	0

APPENDIX B

Genera	Total Active Jan. 1 1969	Removed from Inventory 1969*	Rec'd 1969	Total Active Dec. 31 1969	Plants Distributed 1969
PI Pinus	10	0	1	11	0
PI Polygonum	1	0	0	1	0
Potentilla	6	0	1	7	0
Prunus	1	0	0	1	0
Ptelea	1	0	0	1	0
Pyracantha	1	0	0	1	0
Pyrus	3	0	0	3	0
Quercus	0	0	1	1	83
Rhamnus	3	0	0	3	0
Rhododendron	15	0	7	22	0
Rhus	2	0	0	2	0
Robinia	1	0	0	1	0
Rosa	14	0	0	14	0
Rubus	2	0	0	2	0
Rudbeckia	1	1	0	0	0
Salix	2	0	2	4	148
Salmea	1	0	0	1	0
Salvia	1	0	0	1	0
Sambucus	6	0	0	6	0
Sanquisorba	1	0	0	1	0
Scabiosa	2	0	0	2	0
Securinega	2	0	0	2	0
Sedum	1	0	0	1	0
Sheperdia	2	0	0	2	0
PI Sophora	2	0	0	2	0
Sorbus	4	0	1	5	97
Spiraea	4	0	2	6	35
Stachyurus	1	0	0	1	0
Strobilanthes	1	0	0	1	0
Styrax	1	0	0	1	0
Symplocos	1	0	0	1	0
Syringa	8	0	0	8	0
PI Taiwania	0	0	1	1	0
Taxodium	1	1	0	0	82
Taxus	4	0	0	4	171
Thuja	1	0	1	2	0
Ulmus	39	0	17	56	0
Viburmum	7	0	0	7	0
Viola	1	0	0	1	0
Weigela	2	0	0	2	0
Xanthorhiza	0	0	1	1	0
Yucca	2	0	5	7	0
TOTALS:Genera-142	472	9	75	538	1082

MISCELLANEOUS INFORMATION NOT INCLUDED IN MAIN BODY OF 1969 NC-7 ANNUAL REPORT

1. Regional Station Production Program

The 1969 growing season is the twenty-second since the establishment of the Regional Station at Ames on December 1, 1947. The growing season started late because of a cold, wet spring. Otherwise, growing conditions were good during the season, but the lateness of planting was detrimental to the development of certain early season crops. We did not plant any Brassica, Spinacia, or Pisum introductions at all.

Some of our crops suffered severe loss due to a hailstorm as described on page 2, paragraph 3b, of this report.

The 1969 seed increases resulted in the availability of about 350 additional accessions for the seed list (see Table II).

A summary of the number of accessions grown in 1969, compared with 1968, is provided in Table I.

Table I. Number of Genera and Accessions of Various Crops Grown at the Regional Station in 1969.

Crop	No. of Genera 1968	No. of Genera 1969	No. of Accessions 1968	No. of Accessions 1969
Grasses	26	17	425	690
Legumes	12	14	429	515
Vegetables	9	6	830	677
Ornamentals	133	142	451	538
Special Crops	61	52	296	200
TOTAL	241	231	2431	2620
Carryover of perennial accessions			500	700
Total For Season			2931	3320

Special Purpose Plantings

Corn borer resistance evaluations (corn)	300 acc.	
Corn borer resistance evaluations (peppers)	100 acc.	
Cucumber beetle resistance evaluations	100 acc.	
Corn disease resistance evaluations	310 acc.	1240 plots
Tomato disease resistance evaluations	180 acc.	720 plots
Totals	990 acc.	1960 plots

2. Total Seed and Plant Inventory for 1969

An inventory of accessions on hand in 1969 appears in Appendix A. A summary of that inventory appears in Table II below.

Table II. Summary of Appendix B

Crop	Total Active 1/1/69 Genera	Total Active 1/1/69 Accessions	Removed from Inventory 1969	Rec'd 1969	Total Active 12/31/69	Seed List 1970	To be Increased	Pkts. Plants Distributed '69
Grasses	52	4,699	47	135	4,787	4,454	333	2,743
Legumes	20	2,495	6	302	2,791	2,151	640	469
Vegetables	20	6,720	30	222	6,912	6,312	600	2,085
Oil & Special	89	1,120	28	71	1,163	849	314	1,204
TOTALS	181	15,034	111	730	15,653	13,766	1,887	6,501
Ornamentals	142	472	9	75	538	---	---	1,082
TOTALS	323	15,506	120	805	16,191	13,766	1,887	7,583

3. Seed Transfers to the National Seed Storage Laboratory
None was sent in 1969.

4. Plant Pathology, Entomology and Ornamental Programs. Accomplishments of the Plant Pathology and Entomology programs are described in Supplements I and II of this annual report, respectively. The ornamentals program is discussed below.

a. Ornamental Evaluation Program

(1) Pretreatment of many tree and shrub seed introduced by the Skrdla and Brooks exploration to USSR continued. These include Rosaceae 7 genera, 16 introductions; Cornus-7; Euonymus-6;Rhamnus-2; Genista-2; Rhododendron-3; Ligustrum-4; Hippophae, Juglans, Clematis and Securinega - 1 each. Several germinated and are growing on for Regional Station observation, possible propagation and trial for regional adaptation.

The successful use of little known evergreen introductions in the region is rare. Seedlings of six Arizona Cypress introductions are being grown for trial in the southern and western parts of the Region. These relatively fast growing conifers were introduced by the Viehmeyer - University of Nebraska - domestic exploration from elevations below 5900 feet in Central Arizona.

Experience with fall dug and spring distributed trial plants of Chamaebatiaria millefolium, another Viehmeyer introduction, has been unsuccessful for most plantings failed. Possible explanation may be due to the fact that this plant, while considered to be deciduous, does retain a few leaves at the end of the branches during the winter. These leaves start functioning early in the spring. Thus they are part evergreen. Spring dug plants will be potted or transplanted bare root for comparison with fall dug plants-fall planted, potted, or held over bare root in storage. There should be a successful procedure for handling plants of this genus in the region.

Taiwania cryptomerioides, PI 325071, a relatively unknown evergreen, has been received for observation at the Regional Station.

Seedlings of PI 276114, Lonicera caerulea, have done well in trial at Ames since 1963. Selected individuals will be propagated vegetatively for regional trial.

Five Japanese introductions of Ulmus have performed well at Ames since 1965. If these tree species continue to grow satisfactorily, an attempt will be made to test them further.

5. Domestic Exploration

a. South Dakota. The South Dakota Station received assistance in 1969-70 for the collection of native grass species. Collections were made but no report has been received yet as to the extent of material collected.

b. Alaska. The Alaska Station increased seed of an additional number of accessions collected previously. This seed was placed with the North Central Regional Station for distribution. PI numbers have been requested.

6. New Crops Program.

Evaluation of new crops for potential industrial utilization was continued in 1969. Several accessions were grown for the first time. We had reasonably good success in obtaining stands and carrying them through the blooming stage. However, due to the indeterminate nature and seed shattering tendency of many species, seed production was generally low.

Several Monarda species produced reasonably good size plants but small amounts of seed.

Several biennial crambe accessions performed well.

Any accessions that were harvested after September 6, were quite badly injured by the wind and hail storm.

7. Public Relations

The Regional Station hosted about 200 people in 1969. They included representatives from private interests, state and federal representatives, foreign visitors and student classes. The Iowa Seed Dealers planned a special day at the Station in early July.

SUPPLEMENT I
To
NC-7 Annual Report for 1969

1969 PLANT PATHOLOGY REPORT
North Central Regional Plant Introduction Station
Regional Project NC-7
Ames, Iowa
R. L. Clark

A. Screening for Disease Resistance

1. Corn

a. Diplodia stalk rot

Another 310 accessions were inoculated in a replicated field test. We had a severe wind and hail storm just before readings were to be taken on Reps II, III, and IV. I was still able to take readings on Rep II but III and IV were too badly damaged by the wind and hail. Thus, only 2 reps are included in this year's data. Five PI lines (213791, 218149, 218167, 219873, and 219887) averaged less than 60% rot of the inoculated internode one month after inoculation. Of these five, PI 219887 showed the highest level of resistance to discoloration by Diplodia, averaging only 38% rot in two reps of ten plants each. This is the lowest reading any line has shown in four summers of testing. The amount of discoloration is not, unfortunately, a good measure of a corn's ability to withstand stalk breakage following infection by Diplodia. The five check lines (AES704; Ia.4417A; B37Tms x B14A; C130TRf x B14ATRf; and A239 x B14ATRf) all had higher percentages (97, 90, 94, 95, and 98 respectively) of the inoculated internode discolored by D. zeae inoculation, but all, especially the latter 3, had such strong stalks that they were still standing almost 100% even after the severe wind and hail storm. Many of the PI corns have inherently weak stalks and it is difficult to satisfactorily rate them for stalk rot resistance on the basis of residual stalk strength following Diplodia infection. The method being used in these tests is open to criticism, too, because of the results obtained with known stalk rot "resistant" lines such as the above mentioned check lines, especially those with B14A in the pedigree.

b. Smut (U. maydis)

In the two reps on which readings were taken, only four lines (217404, 217407, 217490, and 221704) showed no smut on any of the twenty plants. Conversely, 214280 and 217405 both had 15 of 20 plants smutted.

c. Rust (P. sorghi)

Only three lines (214123, 221838, and 221842) rated 2 or lower on a 0-5 scale, 5 being severe rust, 0 none. The check lines B37Tms x B14A and C103TRf x B14ATRf also rated below 2. Lines 218136 and 218161 rated 5 in both reps. These would make good susceptible checks for any rust resistance tests and would also be useful in demonstration plots for field days to show farmers and the general public just how good the rust resistance is in commercial corn belt lines.

The type of resistance in the lines 214123, 221838, and 221842 is the mature plant resistance, i.e. there are practically no pustules to be found. Those that do occur are the susceptible type lesion.

d. Northern Leaf Blight (H. turcicum)

Resistance to H. turcicum was most evident in lines 218184, 221832, 221845 and check line C103TRf x B14ATRf. All rated 2 or less on a 0-5 scale based on number and size of lesions. Degree of sporulation by the fungus was not determined.

2. Tomatoes

The tomato plots were defoliated by hail before readings had been taken on leaf diseases. Many lines sent out new growth before frost and some data were taken on Septoria leafspot, anthracnose, and early blight. The fruits were badly damaged by the hail and notes were taken on the general deterioration of the fruits after this injury.

a. Septoria leafspot

Only 129145 and 134418 appeared to be resistant to Septoria in the field. In a greenhouse test, 79532 and 102721 showed promise of resistance.

b. Anthracnose

The hail injury to the stems led to a greater amount of anthracnose than normal in our plots. PI 134417 and 134418 seemed to resist infection.

c. Early blight

Again, 129145 and 134418 looked best as they were quite free of any leaf spots or blights.

d. Fruit rots (General)

The best looking lines for resistance to general deterioration of the fruits were the wild species with small green fruits. Lines 129145, 129149, 129152, 134417, and 134418 showed little breakdown.

B. Records of Plant Diseases in the Field, 1969

Frequent rains in early summer led to outbreaks of bacterial and fungal leafspots on many of our crops. A bush form of Lonicera (PI 276114) was severely affected by a bacterial leafspot. Septoria cornicola was common on Cornus stolonifera. Mycosphaerella rosicola (Cercospora rosicola stage) was common on Rosa (323895). Fabraea maculata again plagued Amelanchier asiatica (PI 317357) and Phyllosticta betulina was common on Betula nigra.

Downy mildew was not found this year but powdery mildew was severe on Helianthus annuus, and on Lonicera. Rust was also heavy on sunflowers this year. Corn rust was abundant and smut completely prevented pollen shed in a few lines.

Common leafspot (Pseudopeziza medicaginis) was "common" on alfalfa, as was alfalfa rust.

An unusually severe outbreak of squash mosaic virus occurred in the Cucurbita, showing up late in the season. Samples taken from the plots showed that rind or flesh of fruits on diseased vines carried the virus but seed transmission was very low.

Septoria lycopersici was abundant in the tomatoes. Had it not been for the hail storm this would have been the best Septoria test year since I have been in Ames.

Ergot was severe in most grasses, especially the Bromes. In many lines the ergot bodies considerably out numbered viable seeds in the heads.

C. In-Service Training

Starting with the Fall Quarter, I have been involved with training in the techniques applicable to electron microscopy. During this Winter Quarter I am learning to operate the electron microscope and other equipment complementary to it. This training will make it possible for me to utilize the excellent EM facilities located here on campus for identification and characterization of unknown viral and bacterial pathogens found in our PI material.

D. Work Planned for Next Year

1. Screening for stalk rot, smut, rust and blight resistance in corn will continue.

2. Screening for fruit rot and Septoria leafspot resistance in tomatoes will continue.

3. Screening alfalfa for root knot nematode resistance will be started again in the greenhouse. A new technique will be utilized which will hopefully give more reproducible results.

4. Sunflower accessions will continue to be checked in the field for presence of downy mildew.

5. Unusual disease occurrence will be noted in any field plots.

6. A spray program will be initiated in an attempt to decrease our ergot problem in the grass seed increase plots.

7. Test the effectiveness of various chemical seed treatments on control of corn smut in problem accessions.

8. Continue to transfer all of our crop data to IBM system, setting up codes for corn and tomatoes.

E. Publications, 1969

1. Clark, R. L., J. L. Jarvis, S. W. Braverman, S. M. Dietz, G. Sowell, Jr., and A. J. Oakes, Jr. 1969. A Summary of Reports on the Resistance of Plant Introductions to Diseases, Nematodes, Insects, and Mites. Zea mays L. 29 p.

2. Clark, R. L. 1969 or 1970. Resistance to Northern Root Knot Nematode (Meloidogyne hapla Chitwood) in Plant Introductions of Daucus carota. FAO Plant Protection Bulletin (in press).

3. Clark, R. L. 1970. Resistance to Diplodia stalk rot in Plant Introduction Corn, 1966-68. (In Manuscript)

SUPPLEMENT II
to
NC-7 Annual Report for 1969

1969 ENTOMOLOGY REPORT

North Central Regional Plant Introduction Station
Regional Project NC-7
Ames, Iowa
J. L. Jarvis

The entire collection of Cruciferae was screened for resistance to the turnip aphid Hyadophis pseudobrassicae. Included were 434 accessions and a total of 25,759 individual plants. Of the 384 introductions and 22,997 plants of Brassica spp. screened only PI 171538, an introduction of oilseed rape (B. napus) was resistant. All other introductions of B. napus were susceptible. Introductions of turnip rape (B. campestris), yellow mustard (B. hirta), chinese cabbage (B. pekinensis), charlock (B. kaber var. pinnatifida), and B. integrifolia var. carinata were all highly susceptible, and nearly all plants were killed by aphid feeding. Oriental mustard (B. juncea), black mustard (B. nigra), and Abyssinian mustard (B. carinata) were less susceptible to aphid attack than other species of Brassica; however, none were given resistant ratings.

Other Cruciferae evaluated for resistance to the turnip aphid were garden-rocket (Eruca sativa), false flax (Camelina sativa), wild radish (Raphanus raphanistrum), garden radish (R. sativus), penny cress (Thaspi arvense), garden cress (Lepidium sativum), and Alyssum dasycarpum. Garden-rocket had some tolerance to aphid feeding; A. dasycarpum was highly resistant and may be a non-host of the turnip aphid. Other species of Cruciferae were highly susceptible.

Winged aphids were usually most attracted to the most susceptible accessions while aphid resistant introductions were unattractive. An exception was false flax which was unattractive to winged aphids but susceptible to aphid feeding.

A total of 300 introductions of corn were screened for resistance to larvae of the first generation of the European corn borer. The following introductions were given resistant ratings: PI 267206, PI 269749, PI 270292, PI 270295, PI 270297, PI 274008, PI 274009, PI 279015, PI 279017, PI 279024, PI 279026, PI 289768, PI 303906, PI 303922, PI 303925, PI 303934, PI 303944, PI 311229, and PI 311231.