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, 1967

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

State Experiment Stations and Representatives

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

U. S. Department of Agriculture

New Crops Research Branch	*J. L. Creech, Chief
Cooperative State Research Service	C. I. Harris
Soil Conservation Service	*M. D. Atkins
Northern Utilization Research & Dev. Div.	*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
Entomologist	J. L. Jarvis

3. PROGRESS OF WORK AND PRINCIPAL ACCOMPLISHMENTS:

a. Introductions of Special Value.

(1) Introductions used in released varieties.

(a) Alfalfa. The Nebraska Station released N.S. 30 germplasm to alfalfa breeders. In its parentage, N.S. 30 contains selections of four plant introductions of M. sativa: PI's 107298 Turkey, 204889 Turkey, 206278 Turkey, and 243224 Iran. It carries resistance to potato leafhopper yellowing and bacterial wilt.

PI 235736, India, contributed germplasm to the varieties 'Unico' and 'Mesa-Sirsa' in Arizona. 'Unico' has resistance to strain ENT-B of the spotted alfalfa aphid.

PI's 183262 Arabia, 215595 India, 226518 Iran and 228287 Iran, contributed germplasm to the variety 'WL 214' in Maryland. It carries resistance to spotted alfalfa aphid and bacterial wilt.

(b) Bluestem. The variety 'Blaze' little bluestem was developed at Nebraska by the selection and hybridization of clones from the 1953 Domestic Collections in Nebraska and Kansas which received support through NC-7. 'Blaze' is winter hardy and late-maturing.

(c) Bromegrass. A selection from PI 172390, Turkey, Bromus bieberstenii, was released as the variety 'Regar' jointly by the Idaho Station and the Soil Conservation Service. 'Regar' has strong regrowth characteristics.

(d) Corn. PI 251934, an inbred line from the USSR, contributed germplasm to the male parent used in the cross, Trojan T x 68, released by the Trojan Seed Company in 1967. It is an early three-way cross.

(e) Dianthus. PI 299429, Dianthus deltoides, collected in 1962 by Glenn Viehmeyer in a mountain meadow of Colorado near Eldora was released and named 'Eldora' by the Nebraska Station.

*Voting members of NC-7 Regional Technical Committee.

(f) Switchgrass. The variety 'Pathfinder' switchgrass was developed at Nebraska by hybridization and selection from the 1953 Nebraska Domestic Collections and Exchanges of switchgrass which received support through NC-7. 'Pathfinder' is winter-hardy, vigorous, leafy, late maturing and rust resistant.

(g) Tomatoes. The greenhouse tomato variety, 'Moto-Red', developed and released by the Michigan Station, contains germplasm from PI 235673, a TMV-resistant line given to the Regional Station by Dr. F. O. Holmes. To develop the variety, selection was made for fruit shape (deep globe), Fusarium wilt and tolerance to strains of Tobacco Mosaic Virus.

b. Accomplishments at the Regional Station.

New agronomic, horticultural and industrial plant introductions totalled 620. For seed increase and revitalization about 2500 accessions were grown. A total of over 8250 packets of seed and plants were distributed.

The NC-7 coordinator went on a plant exploration trip to Russia in 1967 for collecting seed of forage crops in the wild. In 50 days, 360 items were collected and most of them will be sent to the Regional Station for increase.

Introductions evaluated for disease resistance included 310 corn, 295 alfalfa, 204 carrot and 180 tomato. In corn, 6 (179582, 180165, 181844, 182329, 183749, 183800) were resistant to Diplodia stalk rot, 7 (179575, 184276, 185063, 186199, 186225, 193903, 193907) to rust, 3 (181835, 181843, 184284) to northern leaf blight, 12 to smut; in alfalfa, 8 (206112, 206456, 238147, 239946, 292773, 304527, 311456, 315483) to Pseudoplea leafspot; in carrot, 5 (164461, 234623, 267091, 269316, 277710) to northern root knot nematode; in tomato, 7 (126440, 126445, 126448, 126929, 126930, 126946, 127826) to Rhizoctonia fruit rot.

Peppers were tested for resistance to corn borer and green peach aphid. None were borer resistant and no cultivated pepper was aphid resistant. Aphid resistance was found in some wild peppers. Flea beetle resistance is present in most crambe except PI 281732 which was susceptible. No resistance was found in Brassica napus or B. campestris. PI's 312849 and 296061, B. hirta, were resistant.

Central Iowa trial of seedling populations of four trees and shrubs introduced by Viehmeyer from Northern Arizona showed marked differences in adaptation to 1966-67 conditions. All 210 Arizona planetrees died in the winter period. One out of every five singleleaf ash trees appear drought and cold hardy. Tansybush and littleleaf mockorange plantings survived without plant loss or apparent injury.

c. Regional Cooperative Program.

The Ohio Station assisted in disease screening, evaluation, and seed increase of 142 new tomato introductions. Sixty-eight accessions were classified as slight for early blight resistance.

The Nebraska Station: (1)assisted in the evaluation of new alfalfa introductions. Nearly 700 were evaluated during 1949-1967. Several were used in a germplasm release as described in 3a(1)(a) above; (2)continued the evaluation of native grasses collected in 1953 and released two varieties, as listed above; and (3)continued the evaluation of new crops, with publications resulting on crambe and kenaf.

4. USEFULNESS OF FINDINGS:

Plant introductions continue to provide valuable germplasm, especially resistance to insects and diseases, which plant breeders are incorporating into breeding lines and new crop varieties. The evaluation of introductions, and dissemination of this information, is beneficial to plant breeders, horticulturists and agronomists, both public and private, and ultimately to the general public through release of improved crop varieties. Maintenance of plant introductions assures a valuable germplasm pool for potential future use.

5. WORK PLANNED FOR NEXT YEAR:

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

b. Continue domestic exploration for native grasses in Alaska.

6. PUBLICATIONS ISSUED OR MANUSCRIPTS PREPARED DURING THE YEAR: Publications that concern information on plant introductions are listed below. Additional ones are listed in Appendix A.

a. State Station Publications.

(1) Indiana

Papathanasiou, G. A. and K. J. Lessman. June 1966. Crambe. Purdue University Research Bul. No. 819, 8 pp.

(2) Michigan

(a) Murakishi, H. H. and S. Honma, May 1967. Resistance to Tomato Double Virus Streak. Mich. Quar. Bul. 49(4):416-421.

(b) Anderson, E. T. and T. S. Weir. 1967. Prunus Hybrids, Selections and Cultivars, at the University of Minnesota Fruit Breeding Farm. Univ. of Minn. Agr. Exp. Sta. Tech. Bul. 252, 51 pp., 92 fig.

(c) Lockwood, J. L. and D. Markarian. 1967. Breeding Eggplants for Resistance to Verticillium Wilt: 1961-1966. Quar. Bul. Mich. Agr. Exp. Sta. 50(1): 50-58 (August).

(d) Phillip, M. J., S. Honma and H. H. Murakishi. 1967. The Effect of Mixed Infection with Tobacco Mosaic Virus and Potato Virus X on Flowering and Yield of Field-Grown Tomatoes. Quar. Bul., Mich. Agr. Exp. Sta. 50(1):25-30 (August).

(3) Minnesota

Radcliffe, E. B. and Frederick G. Holdaway. 1967. Sweetclover Weevil Resistance in Melilotus Adans., Medicago L., and Trigonella L. Minn. Agr. Exp. Sta. Tech. Bull. 255, 26 pp., 3 tables.

(4) Nebraska

(a) Williams, J. H. 1967. Kenaf - Potential Wood Pulp Crop. Farm, Ranch and Home Quar., Nebr. Agr. Exp. Sta. Spring 1967:7-8.

(b) Coyne, Dermot P., Orvin C. Burnside and Wayne Whitney. 1967. 2,4-D and Tomatoes. Farm, Ranch and Home Quar., Nebr. Agr. Exp. Sta. Spring 1967:1 page.

(c) _____ and M. L. Schuster. 1967. Disease Tolerant Beans Tested. Farm, Ranch and Home Quar., Nebr. Agr. Exp. Sta., Summer 1967:10-12.

b. USDA Publications.

Busbice, T. H., D. K. Barnes, C. H. Hanson, R. R. Hill, Jr., W. V. Campbell, C. C. Blickenstaff, and R. C. Newton. 1967. Field Evaluation of Alfalfa Introductions for Resistance to the Alfalfa Weevil Hypera postica (Gyllenhal). Crops Research ARS 34-94: 13 pages, 5 tables (December).

c. Journal Articles.

(1) Indiana

(a) Iizuka, Muneo and Jules Janick. 1966. The Synthesis of Heteromorphic Sex Chromosomes in Spinach. J. of Heredity 57(5):182-184. (September-October).

(b) Dudley, John W. and R. L. Davis. 1966. Preliminary Groupings of Plant Introductions of Alfalfa (Medicago sativa L.) for Heterosis Studies. Crop Sci. 6(6):597-600.

(c) Papathanasiou, G. A., K. J. Lessman, and W. F. Nyquist. 1966. Evaluation of Eleven Introductions of Crambe, Crambe abyssinica Hochst. Agron. J. 58(6):587-589.

(2) Iowa

(a) *Clark, R. L. 1967. Curly Top on Tomatoes and Pumpkins in Iowa in 1967. Pl. Dis. Rep. 51(2):1069.

(b) Hawk, V. B. and C. P. Wilsie. 1965. Emerald Crownvetch. Crop Sci. 5:290.

(3) Minnesota

Banttari, E. E. 1966. Grass Hosts of Aster Yellows Virus. Pl. Dis. Rep. 50(1):17-21.

(4) Michigan

(a) Hedlin, L. K. and E. B. Radcliffe. 1966. Resistance of Sweetclover to the Sweetclover Weevil. Proc. North Cent. Br., Entomol. Soc. Amer. 21: 128-132.

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(b) Phillip, N. J., Honma, S. and Murakishi, H. H. 1966. Inheritance of Resistance to Tobacco Mosaic Virus-Induced Internal Browning in Tomatoes. Proc. Amer. Soc. for Hort. Sci. 88:544-549.

(5) Missouri

Lambeth, V. N. 1960. Origin and Performance of Tuckcross Forcing Tomatoes. Proc. Amer. Soc. for Hort. Sci. 75:570-573.

(6) Nebraska

(a) Coyne, D. P., M. L. Schuster, and Robert Fast. 1967. Sources of Tolerance and Reaction of Beans to Races and Strains of Halo Blight Bacteria. Pl. Dis. Rep. 51(1):20-24.

(b) _____ and _____. 1967. A Source of Tolerance and Reaction of Tomato Species and Varieties to Bacterial Spot Pathogen. Pl. Dis. Rep. 51(1):25-28.

(c) Manglitz, G. R. and J. L. Jarvis. 1966. Damage to Sweetclover Varieties by Potato Leafhopper. J. Econ. Entomol. 59(3):750-751.

(7) Ohio

Cirulli, Mateo and L. J. Alexander. 1966. A Comparison of Pathogenic Isolates of Fusarium oxysporum f. lycopersici and Different Sources of Resistance in Tomato. Phytopathology 56(11):1301-1304.

(8) Wisconsin

Nielsen, E. L. and J. Nath. 1962. Cytology of Tetrapolid x Hexaploid Timothy (Phleum pratense L.). Euphytica 11:157-163.

(9) U.S.D.A.

(a) Toy, S. J. and B. C. Willingham. 1966. Effect of Temperature on Seed Germination of Ten Species and Varieties of Limnanthes. Econ. Bot. 20(1):71-75.

(b) White, G. A. and I. A. Wolff. 1967. Crambe, A Progress Report. Crops and Soils, January 1967:16.

7. APPROVED:

January 25, 1968
Date

W H Gabelman
Chairman, Technical Committee
W. H. Gabelman

January 25, 1968
Date

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

MISCELLANEOUS PUBLICATIONS

1. Publications in Manuscript.

a. Hall, C. V. and R. H. Painter. Insect Resistance in Cucurbita. North Central Regional Research Publication No. 183. Kansas Agricultural Experiment Station.

b. *Skrdla, W. H., L. J. Alexander, Gene Oakes, and A. F. Dodge. Horticultural Characters and Reaction to Two Diseases of the World Collection of the Genus Lycopersicon. North Central Regional Research Publication No. 172. Ohio Agricultural Research and Development Center.

2. Mimeograph Publications.

a. *Dodge, A. F. 1967. Five-year Report on Regional Plantings of Woody Ornamentals and Shelter Plants in the North Central Region, 1959-1963. Loose Leaf Notebook, North Central Regional Plant Introduction Station, Ames, Iowa. 16 pp., 8 maps.

b. Mohanakumaran, N., J. C. Gilbert and R. L. Young. 1967. Bacterial Wilt Resistant Tomato Lines with Unusually High Content of the Alkaloid, Tomatin. Tomato Genetics Cooperative Report 17:41.

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

a. Alfalfa

(1) Nielson, M. W. and M. H. Schonhorst. 1967. Sources of Alfalfa Seed Chalcid Resistance in Alfalfa. J. of Econ. Entomol. 60(6):1506-1511.

(2) Norwood, B. L., R. S. VanDenBurgh, C. H. Hanson and C. C. Blickenstaff. 1967. Factors Affecting Resistance of Field-Planted Alfalfa Clones to the Alfalfa Weevil. Crop Sci. 7:96-99.

b. Bromegrass

Foster, Ronald B., H. C. McKay and E. W. Owens. 1966. Regar Bromegrass. Idaho Agr. Exp. Sta. Bul. 470, August, 7 pp.

c. Corn

(1) Bennett, S. E., L. M. Josephson, and E. E. Burgess. 1967. Field and Laboratory Studies on Resistance of corn to the Corn Earworm. J. of Econ. Entomol. 60(1):171-173.

(2) Josephson, L. M., S. E. Bennett and E. E. Burgess. 1966. Methods of Artificially Infesting Corn with the Corn Earworm and Factors Influencing Resistance. J. of Econ. Entomol. 59(6):1322-1324.

(3) McMillian, W. W., K. J. Starks and M. C. Bowman. 1967. Resistance in Corn to the Corn Earworm, Heliothis zea, and the Fall Armyworm, Spodoptera frugiperda (Lepidoptera:Noctuidae). Part I. Larval Feeding Responses to Corn Plant Extracts. Ann. of the Entomol. Soc. of Amer. 60(5):871-873.

(4) 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(4):920-923.

(5) Starks, K. J., M. C. Bowman and W. W. McMillian. 1967. Resistance in Corn to the Corn Earworm, Heliothis zea, and the Fall Armyworm, Spodoptera frugiperda (Lepidoptera:Noctuidae). Part III. Use of Plant Parts of Inbred Corn Lines by the Larvae. Ann. of the Entomol. Soc. of Amer. 60(5):873-874.

d. Millet

Hinze, Greg, Herb Mann and Ted Haus. 1967. Millet Improvement Program - Results of Two Years of Testing at Wray and Springfield, Colorado. Colo. Agr. Exp. Sta. Progress Report PR 204, June 1967: 1 page.

*Regional Plant Introduction Station

e. Spinach

(1) Smith, Paul G., R. E. Webb and Carl H. Luhn. 1962. Immunity to Race 2 of Spinach Downy Mildew. Phytopathology 52(7):597-599.

(2) Janick, J. and M. Iizuka. 1962. Sex Determination in Spinach. Proceedings of the XVIth International Horticultural Congress, 1962 at Brussels, Belgium, Aug. 31-Sept. 8, pages 82-88.

f. Tomato

(1) Acosta, J. C., J. C. Gilbert and V. L. Quinon. 1964. Heritability of Bacterial Wilt Resistance in Tomato. Proc. Amer. Soc. for Hort. Sci. 84:455-462.

(2) Stall, R. E. and J. M. Walter. 1965. Selection and Inheritance of Resistance in Tomato to Isolates of Races 1 and 2 of the Fusarium Wilt Organism. Phytopathology 55(11):1213-1215.

(3) Wolfenbarger, D. A. Tomato, Lycopersicon esculentum, and Lycopersicon Species and Genetic Markers in Relation to Mite, Tetranychus marianae, Infestations. J. of Econ. Entomol. 58(5):891-893.

(4) _____. 1966. Variations in Leaf Miner and Flea Beetle Injury in Tomato Varieties. J. of Econ. Entomol. 59(1):65-68.

4. Foreign Publications. These publications concern plant introductinns that were furnished by the North Central Regional Station. In one, the plant introductions are specifically identified, but in the work from Canada, they are not. However, we furnished seed of 10 Lotus introductions for the Canadian work. Other species were evidently obtained elsewhere.

(1) Canada

Grant, W. F. and B. S. Sidhu. Basic Chromosome Number, Cyanogenetic Glucoside Variation, and Geographic Distribution of Lotus Species. Canadian J. of Bot. 45:639-647.

(2) Japan (English translation)

Iizuka, M. 1964. Variation of Karyotypes and Sex Appearance in Spinacea oleracea. Japanese J. of Genetics 39(5):345. (Paper submitted to the 36th annual meeting of the Genetic Society of Japan in 1964).

APPENDIX B

Inventory and Summary of Accessions Maintained and Received through 1967.

Genera	Total Active Jan. 1 1967	Removed from Inventory 1967*	Rec'd. 1967	Total Active Dec. 31 1967	Seed List 1968	** To Be Increased	Pkts. Distributed
GRASSES & FIELD CROPS							
Aegilops	157	0	5	162	140	22	5
Agropyron	167	0	0	167	161	6	22
Agrostis	116	1	16	131	108	23	54
Alopecurus	38	0	0	38	31	7	14
Apera	6	0	0	6	5	1	0
Arrhenatherum	14	0	0	14	11	3	0
Brachypodium	1	1	0	0	0	0	1
Bromus	505	0	27	532	434	98	68
Calamagrostis	11	0	0	11	9	2	7
Cynosurus	8	0	0	8	8	0	3
Dactylis	360	3	35	392	334	58	90
Danthonia	3	0	0	3	2	1	2
Echinochloa	25	0	0	25	20	5	19
Elymus	12	0	0	12	0	12	6
Eremopoa	2	0	1	3	2	1	0
Eremopyrum	13	1	0	12	12	0	3
Eriachne	0	0	1	1	0	1	0
Euchlaena	9	0	0	9	7	2	2
Festuca	192	3	1	190	187	3	90
Gaudiniopsis	1	0	0	1	1	0	0
Glyceria	2	0	2	4	0	4	0
Helictotrichon	4	0	2	6	5	1	1
Heteranthelium	4	0	1	5	3	2	1
Hordeum	7	0	0	7	7	0	4
Koeleria	9	0	0	9	6	3	4
Lolium	123	0	6	129	121	8	191
Nardus	2	0	0	2	2	0	0
Neurachne	0	0	0	0	0	0	0
Panicum	216	4	20	232	186	46	346
Paspalum	0	0	0	0	0	0	1
Pennisetum	2	2	0	0	0	0	1
Phacelurus	1	1	0	0	0	0	1
Phalaris	75	0	0	75	73	2	67
Phleum	47	1	2	48	43	5	21
Poa	49	0	0	49	49	0	44
Polypogon	6	0	8	14	5	9	2
Puccinellia	4	1	0	3	0	3	1
Schedonnardus	1	0	0	1	1	0	1
Secale	5	0	0	5	5	0	2
Setaria	169	1	6	174	131	43	185
Sorghum	31	0	0	31	29	2	7
Sporobolus	1	1	0	0	0	0	1
Stipa	1	0	0	1	0	1	0
Tricholaena	2	0	0	2	2	0	1
Tridens	2	0	0	2	2	0	1
Tripsacum	1	0	0	1	0	1	0
Trisetum	4	0	0	4	0	4	1
Triticum	1	0	0	1	0	1	0
Zea mays--Introd.	1815	10	13	1818	1775	43	1212
St. O.P. Coll.	259	0	0	259	230	29	----
TOTAL ZEA MAYS	2074	10	13	2077	2005	72	1212
TOTALS:Genera-49	4483	30	146	4599	4147	452	2482

*Removed because of transfer to other regions, to Glenn Dale Storage or loss of seed due to inability to obtain increase and/or loss of viability.

**Does not include seed list items regrown for seed increase or maintenance of viability.

APPENDIX B

Genera	Total Active Jan. 1 1967	Removed from Inventory 1967*	Rec'd. 1967	Total Active Dec. 31 1967	Seed List 1968	** To Be Increased	Pkts. Distributed
LEGUMES							
Armeria	1	0	0	1	0	1	0
Astragalus	57	0	0	57	34	23	16
Coronilla	27	1	2	28	21	7	58
Cytisus	4	0	0	4	0	4	4
Dalea	11	0	0	11	2	9	4
Dolichos	0	0	0	0	0	0	2
Dorycnium	1	0	0	1	1	0	2
Galega	4	0	1	5	1	4	4
Lathyrus	268	2	9	275	124	151	41
Lespedeza	31	0	0	31	26	5	0
Lotus	162	2	0	160	158	2	86
Lupinus	0	0	0	0	0	0	2
Madia	1	0	0	1	0	1	0
Medicago	771	6	15	780	737	43	829
Melilotus	279	0	11	290	206	84	5
Onobrychis	62	0	6	68	52	16	8
Ononis	7	0	0	7	5	2	10
Phaseolus	0	0	0	0	0	0	1
Psoralea	23	0	3	26	13	13	7
Scorpiurus	26	0	17	43	26	17	6
Stylosanthes	0	0	1	1	0	1	0
Tetragonolobus	17	0	2	19	13	6	5
Trifolium	452	0	0	452	446	6	64
Trigonella	139	0	28	167	132	35	32
Vicia	1	0	0	1	0	1	3
Vigna	0	0	0	0	0	0	1
TOTALS:Genera-26	2344	11	95	2428	1997	431	1190
FRUITS & VEGETABLES							
Allium	198	0	3	201	180	21	10
Apium	57	0	3	60	56	4	0
Asparagus	53	0	0	53	26	27	2
Beta	297	0	2	299	298	1	0
Carica	3	0	0	3	0	3	0
Citrullus	3	0	3	6	0	6	0
Cucumis	479	3	47	523	459	64	198
Cucurbita	390	0	82	472	401	71	425
Daucus	304	0	11	315	230	85	90
Fragaria	0	0	2	2	0	2	0
Lactuca	263	4	1	260	249	11	198
Lycopersicon	3016	0	27	3043	2948	95	1528
Orlaya	1	0	0	1	0	1	0
Petroselinum	65	0	73	138	24	114	0
Phaseolus	36	0	0	36	0	36	0
Pisum	1282	0	2	1284	1258	26	518
Prunus	1	0	0	1	0	1	0
Pyrus	2	0	0	2	0	2	0
Rheum	7	0	0	7	4	3	0
Rubus	82	0	2	84	0	84	0
Solanum	1	0	0	1	0	1	0
Spinacia	187	0	3	190	185	5	0
Vaccinium	4	0	0	4	0	4	0
TOTALS:Genera-23	6731	7	261	6985	6318	667	2969

Genera	Total Active Jan. 1 1967	Removed from Inventory 1967*	Rec'd. 1967	Total Active Dec. 31 1967	Seed List 1968	** To Be Increased	Pkts. Distributed
OIL & SPECIAL							
Adonis	0	0	1	1	0	1	0
Alyssum	1	0	0	1	1	0	0
Ammi	0	0	0	0	0	0	0
Anethum	19	0	51	70	16	54	3
Arctium	1	0	0	1	1	0	0
Biscutella	0	0	1	1	0	1	0
Brassica	424	8	28	444	397	47	172
Briza	3	0	0	3	0	3	0
Bupleurum	1	0	0	1	0	1	0
Calendula	3	0	0	3	2	1	0
Caltha	0	0	1	1	0	1	0
Camelina	8	0	0	8	7	1	0
Cardamine	0	0	1	1	0	1	1
Cassia	6	0	0	6	1	5	0
Chamaepeuce	0	0	1	1	0	1	0
Chenopodium	2	0	1	3	0	3	0
Cichorium	2	0	0	2	2	0	0
Cnicus	1	0	0	1	0	1	0
Coleus	12	0	0	12	12	0	0
Crambe	29	0	1	30	22	8	114
Crepis	1	0	0	1	0	1	0
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	0
Ducrosia	1	0	0	1	0	1	0
Echinacea	1	0	0	1	0	1	1
Eruca	32	0	0	32	32	0	1
Euphorbia	8	0	0	8	6	2	11
Foeniculum	2	0	0	2	2	0	0
Glaucium	1	0	0	1	1	0	0
Guizota	1	0	0	1	0	1	0
Helenium	1	0	0	1	0	1	1
Helianthus annuus	274	1	22	295	286	9	711
Helianthus spp.	6	0	1	7	2	5	0
Hibiscus (Kenaf)	1	0	0	1	0	1	3
Iberis	2	0	0	2	0	2	0
Impatiens	0	0	1	1	0	1	0
Lallemantia	3	0	0	3	1	2	0
Lappula	1	0	0	1	0	1	0
Lapsana	0	0	1	1	0	1	0
Lepidium	1	0	0	1	0	1	0
Limnanthes	17	0	0	17	17	0	0
Leonotis	1	0	0	1	0	1	0
Lobularia	1	0	0	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	10	0	0	10	9	1	0

Genera	Total Active Jan. 1 1967	Removed from Inventory 1967*	Rec'd. 1967	Total Active Dec. 31 1967	Seed List 1968	** To Be Increased	Pkts. Dis-trib-uted
Picris	0	0	2	2	0	2	0
Raphanus	8	0	0	8	8	0	8
Ricinus	10	0	0	10	0	10	0
Robinia	1	0	0	1	1	0	0
Rosa	1	0	0	1	1	0	0
Rudbeckia	1	0	0	1	1	0	0
Salvia	1	0	0	1	1	0	1
Satureja	5	0	1	6	2	4	1
Schlechtendalia	2	0	0	2	0	2	0
Sesamum	5	0	0	5	0	5	0
Sideritis	1	0	0	1	1	0	0
Sigesbeckia	1	0	0	1	0	1	0
Sinapis	2	0	0	2	0	2	2
Sisymbrium	1	0	0	1	0	1	0
Solanum	14	0	0	14	0	14	0
Spergula	2	0	0	2	0	2	0
Stenachaenium	1	0	0	1	0	1	0
Symphytum	1	0	0	1	1	0	0
Tephrosia	2	0	0	2	0	2	0
Thalictrum	0	0	2	2	0	2	1
Thlaspi	0	0	1	1	1	0	0
Trachyspermum	0	0	1	1	0	1	0
Vaccaria	1	0	0	1	1	0	0
Vernonia	3	0	0	3	3	0	4
TOTALS:Genera-73	962	9	118	1071	845	226	1037

Genera	Total Active Jan. 1 1967	Removed from Inventory 1967*	Rec'd. 1967	Total Active Dec. 31 1967	Use In Program	Plants Distributed 1967
ORNAMENTALS						
PI Abelia	1	0	0	1	H	0
Abeliophyllum	1	0	0	1	DG	26
PI Abies	1	0	0	1	G	0
Acanthopanax	1	0	0	1	G	0
PI Acer	5	0	0	5	G	0
PI Alnus	5	0	0	5	G	0
PI Amelanchier	5	0	0	5	G	0
Amorpha	4	0	0	4	HG	0
PI Ardisia	1	0	0	1	G	0
PI Aronia	0	0	1	1	H	0
PI Begonia	3	0	1	4	G	0
PI Belancanda	1	0	0	1	G	0
Berberis	1	0	0	1	G	0
PI Betula	2	1	3	4	G	0
PI Buddlea	1	0	0	1	G	0
PI Buxus	22	0	1	23	G	0
PI Camellia	1	0	0	1	G	0
PI Caragana	1	0	1	2	G	0
PI Carpinus	1	0	0	1	G	0
Caryopteris	1	0	0	1	G	0
Castanea	1	0	0	1	G	0
PI Celastrus	2	1	0	1	G	0
PI Cephalaria	0	0	1	1	H	0
PI Cercocarpus	2	0	0	2	G	0
PI Chamaebatiaria	4	0	0	4	G	0
PI Chrysanthemum	6	0	0	6	G	0
PI Clematis	1	0	0	1	DG	2
PI Coleus	24	0	0	24	G	0
PI Cornus	4	0	5	9	G	0
Corylus	1	0	0	1	G	0
PI Cotoneaster	8	0	5	13	G	0
Crataegus	1	0	6	7	GH	0
Cytisus	1	0	0	1	H	0
PI Damnacanthus	1	0	0	1	G	0
PI Dasylirion	1	0	0	1	DG	67
Deutzia	1	0	0	1	G	0
PI Dianthus	2	0	3	5	G	6
PI Dierama	1	0	0	1	G	0
Dirca	1	0	0	1	G	0
PI Duchesnea	1	0	0	1	G	0
Elaeagnus	2	0	0	2	G	0
Elsholtzia	1	0	0	1	G	0
Eucommia	1	0	0	1	G	0
Euonymus	6	0	0	6	DG	2
PI Euphorbia	1	0	0	1	G	0
PI Foresteria	1	0	0	1	G	0
Forsythia	1	0	0	1	G	0
Fothergilla	1	0	0	1	G	0

Genera	Total Active Jan. 1 1967	Removed from Inventory 1967	Rec'd. 1967	Total Active Dec. 31 1967	Use In Program	Plants Distributed 1967
PI Fraxinus	2	0	0	2	G	0
Gleditsia	1	0	0	1	DG	3
Haemanthus	1	0	0	1	G	0
PI Hedera	2	0	0	2	G	0
Hippophae	0	0	1	1	G	109
Hydrangea	2	0	0	2	G	2
Hypericum	8	3	2	7	G	0
PI Ilex	29	0	0	29	G	0
Indigofera	1	0	0	1	H	0
Iris	3	0	1	4	G	0
Jamesia	1	0	0	1	G	0
PI Kohleria	1	0	0	1	G	0
Ledum	1	0	0	1	G	0
PI Ligustrum	5	1	0	4	DG	4
PI Lippia	1	0	0	1	G	0
Liquidambar	0	0	1	1	G	0
Liriope	1	0	0	1	G	0
Lonicera	5	0	0	5	G	0
Lythrum	1	0	0	1	G	0
Malus	5	0	0	5	DG	2
Metasequoia	1	0	0	1	G	0
Mimulus	0	0	1	1	G	0
Morus	1	0	0	1	G	0
Pachistima	1	0	0	1	G	0
Passiflora	1	0	0	1	G	0
Penstemon	10	0	0	10	H	0
PI Perephyllum	1	0	0	1	G	0
PI Philadelphus	4	0	1	5	G	88
Photinia	1	0	0	1	G	0
Physocarpus	1	0	0	1	G	2
Pinus	7	0	3	10	G	0
Potentilla	4	0	2	6	G	0
Prunus	1	0	2	3	G	89
PI Ptelea	0	0	1	1	G	0
PI Pyracantha	0	0	1	1	G	0
Pyrus	2	0	0	2	H	0
Quercus	1	0	1	2	G	0
Rhamnus	0	0	1	1	G	0
Rhododendron	4	1	1	4	G	0
Rhus	2	0	0	2	G	0
Robinia	1	0	0	1	H	0
Rosa	8	0	3	11	G	78
Rubus	1	0	0	1	H	0
Rudbeckia	1	0	0	1	G	0
Salix	1	0	1	2	G	86
PI Salvia	1	0	0	1	G	0
PI Sambucus	1	0	0	1	G	0
PI Scabiosa	1	0	1	2	G	0
Securinega	1	0	0	1	G	0
PI Sedum	1	0	0	1	G	0

Genera	Total Active Jan. 1 1967	Removed from Inventory 1967	Rec'd. 1967	Total Active Dec. 31 1967	Use In Program	Plants Distributed 1967
Sheperdia	1	0	0	1	H	0
Sophora	1	0	0	1	H	0
Spiraea	4	0	0	4	G	0
Stachyurus	1	0	0	1	G	0
Symplocos	1	0	0	1	G	0
Syringa	6	0	2	8	G	0
Taxodium	0	0	1	1	G	0
Thuja	3	1	0	2	G	0
PI Ulmus	8	5	10	13	G	0
Vaccinium	3	0	0	3	H	0
PI Viburnum	2	0	3	5	G	0
Weigela	2	0	0	2	DG	4
PI Yucca	0	0	2	2	G	0
TOTALS:Genera-111	291	13	69	352		570

Miscellaneous Information Not Included in Main Body of 1967 NC-7 Annual Report

1. Regional Station Production Program

The 1967 growing season is the twentieth since the establishment of the Regional Station at Ames on December 1, 1947. The growing season was quite variable. It started out as hot and dry but June was very wet. We received rainfall on 20 of the first 21 days. Dry and hot conditions started in July but August was mostly dry and cool. The dry condition continued throughout the rest of the growing season.

The 1967 seed increases resulted in the availability of about 620 additional accessions, as shown below:

Inventory of available crop accessions

1966	1967	Increase
12,684	13,307	623

Table I. Number of Genera and Accessions of Various Crops Grown at the Regional Station in 1967.

Crop	No. of Genera		No. of Accessions	
	1966	1967	1966	1967
Grasses	22	20	383	586
Legumes	12	13	239	334
Vegetables	9	9	820	679
Ornamentals	61	111	137	352
Special Crops	35	44	255	220
TOTAL	139	197	1834	2171
Carryover of perennial accessions			250	300
Total For Season			2084	2471

Special purpose plantings

Corn borer evaluations	300 acc.	
Cucumber beetle evaluations	105 acc.	
Corn disease evaluations	312 acc.	1248 plots
Tomato disease evaluations	180 acc.	720 plots
TOTAL	897 acc.	1968 plots

2. Total Seed and Plant Inventory for 1967

An inventory of accessions on hand in 1967 appears in Appendix B. A summary of that inventory appears in Table I below.

Table II. Summary of Appendix B.

Crop	Total Active 1/1/67		Removed from Inventory 1967	Rec'd 1967	Total Active 12/31/67	Seed List 1968	To Be Increased	Pkts. Plants Distributed
	Genera	Accessions						
Grasses	49	4483	30	146	4599	4147	452	2482
Legumes	26	2344	11	95	2428	1997	431	1190
Vegetables	23	6731	7	261	6985	6318	667	2969
Oil & Special	68	962	9	118	1071	845	226	1037
TOTALS	166	14,520	57	620	15,083	13,307	1776	7678
Ornamentals	111	296	13	69	352	------	----	570
TOTALS	277	14,816	70	689	15,435	13,307	1776	8248

3. 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 were sent in 1967:

Corn	10 accessions
Tomatoes	151 accessions
TOTAL	161

Additional seed will be transferred in 1968.

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

a. Trial Plant Distribution

Eight items were distributed to Regional trial cooperators during the spring. Plants of the smooth-leaf Sotol, PI 323689 Dasylirion leiophyllum, a Viehmeyer introduction from the Davis Mts., Texas were included. This accession is an interesting ornamental. It apparently lacks cold hardiness, at least in the two-year size.

Prunus cistina and P. triloba, both budded on virus-free Prunus hortulana seedlings, were distributed to cooperators for regional trial planting. The hortulan plum as a root stock produces a minimum of sprouts as compared to the prolific sprouting of the American plum commonly used as understock in the Region.

Other plants supplied to cooperators on request included: Abeliophyllum distichum; Hippophae rhamnoides; Philadelphus 'Ophelia'; Rosa 'Climbing Show Garden'; and Salix sachalinensis Sekka.

Commercial nurseries furnished 450 plants while 120 were grown at the Regional Station.

Data from regional trial cooperators' reports were consolidated into 5-year reports for eight items on regional trial.

b. Ornamental Introductions in Trial at Regional Station

Table I. Viehmeyer's Arizona and Utah Introductions Differ in Reaction to Central Iowa Drought and Cold, Winter 1966-67.

Plant Name	PI No.	No. of Plants Fall 1966	No. of Plants Spring 1967	Remarks
Chamaebateris millifolium	~~323673~~ 323675	150	150	No loss, no injury
Philadelphus microphyllus	323858	53	53	Injury to tips of twigs of some plants; others uninjured
Platanus wrightii	323864	210	0	Two year plants killed
Fraxinus anomala	323702	119	110*	1 plant in 5 satisfactory

* I 22 plants grew from 2nd pair of buds below terminal - hardiest
II 62 plants grew from 3rd pair of buds or below
III 26 plants with sprouts from the ground
IV 8 plants killed outright during winter
V 1 plant failed to transplant 1966

(1) Chamaebateria millifolium PI 323673, 323674, 323675

Plants floriferous, fragrant, most plants rather open, upright and tend to lose older foliage throughout growing season. Leaf remains accumulate beneath and forms a slight mulch.

(a) Live foliage at ends of twigs present all winter

(b) No twig injury from winter period

(c) Foliage gray green

(d) June 30, 1967: brown (dead) foliage noted

(e) Flowers start July 8, 1967, plant 11 Row 45

(f) Flowers continue well into September

(g) Plants open-but plant #60 Row 40 appears compact 1/3 regular size with numberous lateral branches with short shoot growth. A distinct plant with only a few flowers.

(2) Philadelphus microphyllus PI 323858

Fifty-three plants of which 20 plants have more attractive foliage including 6 plants with numerous ascending branches forming dense mound shaped plants. One plant with drooping twigs. Worthwhile material. Further observations planned prior to propagation.

(3) Platanus wrightii PI 323864

All 210 two-year transplants were killed during the 1966-67 winter period. Plants 2-4 feet in size were actively growing at the time of first freeze, October 3-4, 1966.

(4) Fraxinus anomala PI 323702

One plant in five surviving proved to be relatively hardy. This three-year seedling population will be observed for future reaction to local climate and soils.

(5) Amelanchier alnifolia PI 303168, 303169, 303170, 303171

Plant #24, row 47, from PI 303170 was outstanding for compact, upright plant-body composed of several stems which were generally leafy until mid August. Further observations planned. No evidence of drought or winter injury found among 180 plants.

(6) Cercocarpus montanus PI 303225

No evident dormant season injury. Plant #10 of 19 seedlings holds leaves, has a confined shape and somewhat less leggy than others.

(7) Lonicera coerulea PI 276114, Japan

33 seedlings withstood record 1966-67 fall and winter drought without plant loss or evident damage to leaf or flower buds. Plant #6 has been propagated for regional trial. This plant is subject to the lonicera leaf-blight under greenhouse conditions. New seedlings will be grown from 1967 seed for screening for leaf-blight resistance.

5. Domestic Exploration

The Alaska Station continued its exploration for native grass species. In 1967, 225 accessions were collected of Poa, Festuca, Agropyron, Elymus, Bromus, Agrostis and others. The work will continue in 1968.

6. New Crops Program

Evaluation of New Crops for potential industrial utilization was continued in 1967. Twenty-one new lines were grown for the first time. They are:

Adonis aestivalis
Biscutella laevigata
Brassica campestris (PI 179641)
Brassica campestris (PI 183391)
Brassica campestris (PI 319413)
Brassica chinensis (PI 319417)
Briza spicata
Briza subaristata
Caltha palustris
Cardamine impatiens
Chamaepeuce hispanica
Impatiens edgeworthii
Lamium purpureum
Lapsana communis
Onobrychis caputgalli (PI 233258)
Picris hieracioides
Picris japonica
Satureja hortensis (PI 226649)
Thalictrum lucidum
Thlaspi perfoliatum
Trachyspermum copticum

Results were extremely variable. Some were complete failures, some had long delayed germination in that even though planted in the spring, they did not emerge until fall, while some emerged but died, possibly due to hot weather. The only species that showed good promise was Satureja hortensis. Agronomically, however, it presents problems because it starts growth slowly (allowing weeds to compete) and it is very indeterminate. By giving the accession hand care, we harvested 1150 grams of seed from a 25 foot row.

7. Public Relations

The Regional Station was visited by about 175 people during 1967. They included representatives from private interests, state and federal representatives, foreign visitors and student classes. The attendees of the meeting of North Central Division, American Phytopathological Society toured the station in June and this represents the largest single group to have been here.