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A Brief History of the North Central Regional Plant Introduction Station and a List of Genera Maintained¹

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A brief history of the North Central Regional Plant Introduction Station is presented. From its inception in 1948 to the present, considerable growth has taken place. At this time, we have 295 genera, of which 173 are ornamentals and many of the rest are crop plants. These plants need to be maintained, preserved, evaluated, and catalogued, so they can be distributed to scientists involved in research, teaching, and extension.

INDEX DESCRIPTORS: Plant introductions, crop plants, ornamentals, germplasm

In 1862, when the U.S. Department of Agriculture (USDA) was organized, plant exploration and introduction were already considered important activities to insure America's agricultural future. Indeed, in the 1850's, advocates for having a separate department of agriculture cited plant introduction as the main reason for its development (Klose 1950). Americans abroad were encouraged to seek new plants and send them back to the United States. If foreign plants had not been introduced, Americans would be limited to few crops and would find it necessary to import most of their food. None of our major crops is native to the United States. Even corn (*Zea mays* L.), our primary grain crop, was brought to our land from Mexico by native Americans.

The USDA Section of Seed and Plant Introduction was established in 1898. This action demonstrated the importance that the federal government assigned to searching the world for new plants and introducing them into this country. Although establishing a separate section was a major step in the right direction, the leaders of those days little realized what a gigantic task was before them. Adequate provisions were not made at that time for the proper maintenance of the seed brought into this country. As a result, much of this original seed was lost.

In 1946, the Research and Marketing Act was passed. This public law provided for the establishment of four state-federal regional plant introduction stations. The North Central Regional Plant Introduction Station (NCRPIS), located in Ames, Iowa, was the first established. It began operation in 1948. Shortly thereafter, three other regional stations were in operation at Geneva, New York, Experiment, Georgia, and Pullman, Washington. (see Skrdla 1975; Anon. 1982; National Plant Germplasm Committee 1978; Wilkes 1983; Steyn 1976; and Burgess 1971 for discussions of the national plant germplasm system).

The four regional plant introduction stations provide the plant science community with working collections of germplasm. From these collections, potential users request seed samples to be utilized in their work. In 1958, the National Seed Storage Laboratory (NSSL) located at Fort Collins, Colorado, began its operation. Its primary function is to provide a backup or base collection for the national germplasm system. It is not intended to provide scientists with seed samples, but rather to provide long term storage and thus help to prevent the loss of germplasm and the erosion of genetic diversity. When the NSSL needs to replenish some of its seed, e.g. due to poor germination, the regional stations will supply the necessary germplasm. Conversely, should a regional station lose its supply of seed, the NSSL will provide seed to be used for increase.

Plants introduced into the United States are first inspected by the Plant Germplasm and Quarantine Center at Beltsville, Maryland.

The Plant Introduction Office, located in the Germplasm Resources Laboratory, also in Beltsville, documents the plant materials, assigns a plant inventory (PI) number, and forwards the seed to the appropriate regional station. (The appropriate station is determined by the regional station coordinators.) The PI numbers are assigned consecutively beginning with the number 1 (this number was given to a cabbage introduced from China). Since 1898, nearly 500,000 numbers have been assigned.

The first coordinator of the NCRPIS was Dr. Max Hoover, who managed the station from 1948 to 1957. Dr. Willis H. Skrdla became coordinator in 1957 and provided leadership for 26 years, until his retirement in 1983. The station staff has increased in size from an agronomist (also coordinator) and a horticulturist to the present professional staff of an agronomist, a research entomologist, a research plant pathologist, and a horticulturist. The farm staff has grown from three farm technicians and a secretary to the present staff of farm superintendent, six research associates, and a field technician. Two secretaries and a computer data entry specialist provide office support. During peak seasons, such as July and August, when controlled pollinations are made for seed increase, and October, when harvest reaches its peak, 20-30 full-time temporary employees are added.

The NCRPIS was established as Regional Research Project NC-7, which is entitled "Introduction, Multiplication, Evaluation, Preservation, Cataloguing, and Utilization of Plant Germplasm." The project is a state-federal joint venture.

Support for the station is derived from three sources; USDA-Agricultural Research Service (ARS), regional research funds (RRF) allocated by the directors of the experiment stations of the 12 north central states (Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), and the Iowa Agriculture and Home Economics Experiment Station.

Iowa State University furnishes the station ca. 30.4 hectares each year for headquarters buildings and seed increase and evaluation. Facilities include: a machine shed, 54.9 × 15.2 m, (built with ARS funds) to house farm equipment and a machine shop; a headquarters building, 68.6 × 18.3 m, (built with RRF funds) which provides offices, laboratories, and seed operations space; a 18.3 × 9.1 m greenhouse; a 15.2 × 15.2 m seed storage building with 7.3 × 15.2 m and 6.7 × 7.9 m cold rooms for seed storage.

Seed is stored at the NCRPIS in cold rooms with a constant temperature of 40°F (4.4°C) and a relative humidity of 40%. Any scientist needing seed for research purposes is encouraged to contact the station. Seed samples provided to researchers usually range from 25-100 seeds, depending on availability and germination percentage. There is no charge for the seed, but there is a request for a performance report. The data from the performance reports are summarized and entered into the station's annual report. The data then become

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available for use by any interested scientist through the Current Research Information System (CRIS).

The mission of the NCRPIS is to provide scientists with plant germplasm needed in their research, teaching, and extension programs. The project objectives are to introduce, multiply, evaluate, preserve, document, utilize, catalogue, and distribute plant germplasm. Every effort is made to preserve the genetic integrity of the germplasm we maintain. In 1983 we distributed over 12,000 packets of seed of 34 genera and received over 2,000 new accessions. Presently we maintain over 23,000 accessions. These accessions are quite diverse, made up of landraces, unimproved foreign germplasm, domestic breeding lines, and selected cultivars held as seed or vegetative stocks. In general, the station maintains a total of 295 genera and 760 species of plant germplasm.

Table 1. Genera of grasses maintained at the N.C. Regional Plant Introduction Station, Ames, IA. 1984.

Genus	No. Species	Total Accessions
<i>Agrostis</i>	18	170
<i>Apera</i>	1	6
<i>Arctagrostis</i>	1	1
<i>Boissiera</i>	1	1
<i>Bromus</i> ^a	(63)	(812)
<i>Calamovilfa</i>	1	2
<i>Echinochloa</i>	6	63
<i>Eremopoa</i>	1	3
<i>Eriachne</i>	1	1
<i>Euchlaena</i>	1	1
<i>Gaudiniopsis</i>	1	1
<i>Glycerta</i>	3	8
<i>Helictotrichon</i>	5	9
<i>Heteranthelium</i>	1	6
<i>Nardus</i>	1	2
<i>Neurachne</i>	1	1
<i>Panicum</i>	36	1160
<i>Polypogon</i>	4	17
<i>Schedonardus</i>	1	1
<i>Setaria</i>	26	922
<i>Tricholaena</i>	2	14
<i>Tridens</i>	2	4
<i>Tripsacum</i>	1	2
<i>Vulpia</i>	1	1
<i>Zea</i>	1	3556
TOTALS	117	5952

^a Maintenance of this genus has been the responsibility of the NCRPIS until its recent transfer to the Western Regional Plant Introduction Station, Pullman, WA.

Table 2. Genera of legumes maintained at the N.C. Regional Plant Introduction Station, Ames, IA. 1984.

Genus	No. Species	Total Accessions
<i>Amblycarpa</i>	1	2
<i>Coronilla</i>	9	74
<i>Dalea</i>	3	15
<i>Galega</i>	2	14
<i>Lathyrus</i> ^a	(34)	(405)
<i>Lespedeza</i>	3	42
<i>Medicago (Peren.)</i>	8	2100
<i>Medicago (Ann.)</i>		665
<i>Melilotus</i>	19	554
<i>Psoralea</i>	8	29
<i>Scorpiurus</i>	4	46
<i>Tetragonolobus</i>	5	20
<i>Trigonella</i> ^a	(31)	(199)
TOTALS	62	3561

^aRecently moved to the Western Regional Plant Introduction Station, Pullman, WA.

Table 3. Genera of vegetables maintained at the N.C. Regional Plant Introduction Station, Ames, IA. 1984.

Genus	No. Species	Total Accessions
<i>Asparagus</i> ^a	23	123
<i>Atriplex</i>	1	13
<i>Beta</i>	2	251
<i>Cucumis</i>	8	757
<i>Cucurbita</i>	5	565
<i>Daucus</i>	8	486
<i>Ferula</i>	1	1
<i>Lycopersicon</i>	9	4750
<i>Pastinaca</i>	1	4
<i>Petroselinum</i>	2	130
<i>Raphanus</i>	3	554
<i>Rheum</i>	2	4
<i>Sium</i>	1	1
<i>Solanum</i> ^b	4	14
<i>Spinacia</i>	2	272
TOTALS	73	7926

^a Includes vegetable and ornamental accessions.
^b Tomato-like solanums; potato-like solanums are maintained at Sturgeon Bay, WI, and the eggplant-like solanums are maintained at Experiment, GA.

Table 4. Genera of specialty and oil seed crops maintained at the N.C. Regional Plant Introduction Station, Ames, IA. 1984.

Genus	No. Species	Total Accessions
<i>Adonis</i>	1	4
<i>Alliaria</i>	1	1
<i>Alyssum</i>	1	1
<i>Amaranthus</i>	10	1044
<i>Ammi</i>	1	2
<i>Anethum</i>	2	66
<i>Arctium</i>	1	1
<i>Basella</i>	1	2
<i>Berteroa</i>	1	2
<i>Bifora</i>	1	1
<i>Biscutella</i>	1	1
<i>Brassica</i>	15	1350
<i>Calamintha</i>	1	1
<i>Calendula</i>	3	4
<i>Caltha</i>	1	1
<i>Camelina</i>	2	9
<i>Carum</i>	1	1
<i>Caucalis</i>	1	1
<i>Chamaepeuce</i>	1	1
<i>Chenopodium</i>	3	27
<i>Cichorium</i>	3	39
<i>Cnicus</i>	1	1
<i>Crambe</i>	13	156
<i>Cynoglossum</i>	1	1
<i>Dimorphotheca</i>	4	4
<i>Durusia</i>	1	1

CROP PLANTS COLLECTION

As of January 1, 1984, the crop plants portion of the NCRPIS collection includes all nonornamentals. Field crops, including grasses and legumes, numbered almost 11,000 accessions and included 34 genera (Tables 1 and 2). Vegetables numbered just under 8,000 accessions and included 15 plant genera (Table 3). The oil and special crops group numbered just under 4,000 accessions but included 73 plant genera (Table 4).

The largest crop collections are: tomato, with 4,750 active accessions; corn, with 3,556; alfalfa, with 2,765; oil-seed *Brassica*, with 1,350; millet (*Panicum* spp.), with 1,160; and amaranths, with 1,044.

For seed increase, every effort is made to maintain the genetic

<i>Echinacea</i>	1	1
<i>Echinops</i>	1	2
<i>Echium</i>	2	2
<i>Enanthebocarpus</i>	1	1
<i>Eruca</i>	2	148
<i>Eryngium</i>	3	5
<i>Euphorbia</i>	6	14
<i>Foeniculum</i>	1	6
<i>Glauclium</i>	1	1
<i>Goldbachia</i>	1	1
<i>Guizotia</i>	1	1
<i>Helenium</i>	1	1
<i>Helianthus</i>	10	757
<i>Heracleum</i>	2	2
<i>Kitabelia</i>	1	1
<i>Lallemantia</i>	2	4
<i>Lappula</i>	2	2
<i>Lapsana</i>	3	3
<i>Leonotis</i>	1	1
<i>Lepidium</i>	2	69
<i>Limnanthes</i>	7	26
<i>Limnoscium</i>	1	1
<i>Madia</i>	1	1
<i>Monarda</i>	1	1
<i>Mosla</i>	1	1
<i>Ocimum</i>	3	69
<i>Oenothera</i>	1	1
<i>Omosa</i>	1	1
<i>Origanum</i>	2	8
<i>Orlaya</i>	1	2
<i>Osteospermum</i>	1	1
<i>Perilla</i>	1	9
<i>Picris</i>	2	3
<i>Rhaponticum</i>	1	4
<i>Rochelia</i>	1	1
<i>Schlectendalia</i>	1	2
<i>Sideritis</i>	2	2
<i>Sigebeckia</i>	1	1
<i>Simaps</i>	3	19
<i>Spergula</i>	1	2
<i>Stokesia</i>	1	1
<i>Symphytum</i>	1	1
<i>Tbalictrum</i>	4	19
<i>Tblaspi</i>	1	1
<i>Trachyspermum</i>	1	1
<i>Vaccaria</i>	1	4
<i>Vernonia</i>	1	2
TOTALS	159	3928

Table 5. Genera of ornamentals maintained at the N.C. Regional Plant Introduction Station, Ames, IA. 1984.

Genus	No. Species	Total Accessions
<i>Acer</i>	10	27
<i>Actinidia</i>	1	1
<i>Aesculus</i>	1	1
<i>Ailanthus</i>	1	1
<i>Alcea</i>	3	7

PLANT INTRODUCTION STATION

Genus	No. Species	Total Accessions						
<i>Alnus</i>	3	6	<i>Genista</i>	1	2	<i>Pblox</i>	1	1
<i>Althaea</i>	1	1	<i>Geranium</i>	1	2	<i>Picea</i>	3	3
<i>Amelanchier</i>	3	6	<i>Ginkgo</i>	1	1	<i>Pinus</i>	9	28
<i>Amorpha</i>	1	2	<i>Gymnocladus</i>	1	1	<i>Pistacia</i>	1	1
<i>Anemone</i>	2	2	<i>Gypsophila</i>	1	1	<i>Polygonum</i>	1	1
<i>Antirrhinum</i>	1	1	<i>Helianthella</i>	1	1	<i>Populus</i>	1	1
<i>Aronia</i>	1	1	<i>Helicrysum</i>	1	1	<i>Portulaca</i>	1	1
<i>Artemisia</i>	1	1	<i>Heliotropium</i>	1	1	<i>Potentilla</i>	2	6
<i>Asphodeline</i>	2	2	<i>Hemerocallis</i>	1	1	<i>Poterium</i>	1	1
<i>Asphodelus</i>	1	1	<i>Hesperis</i>	1	1	<i>Prunus</i>	7	10
<i>Aster</i>	1	1	<i>Heteropappus</i>	1	1	<i>Prelea</i>	1	1
<i>Baileya</i>	1	1	<i>Hippophae</i>	1	3	<i>Pterocarya</i>	1	1
<i>Baptisia</i>	1	1	<i>Hovenia</i>	1	1	<i>Pyrus</i>	2	2
<i>Begonia</i>	1	2	<i>Hydrangea</i>	2	3	<i>Quercus</i>	2	6
<i>Betula</i>	10	22	<i>Hypericum</i>	1	2	<i>Rhamnus</i>	3	7
<i>Bryonia</i>	1	1	<i>Ilex</i>	3	4	<i>Rhododendron</i>	3	3
<i>Buckleya</i>	1	1	<i>Iliamna</i>	1	1	<i>Rhus</i>	4	5
<i>Calendula</i>	1	2	<i>Impatiens</i>	4	4	<i>Ribes</i>	1	1
<i>Campanula</i>	4	5	<i>Ipomoea</i>	1	1	<i>Robinia</i>	1	2
<i>Caragana</i>	3	6	<i>Iris</i>	2	4	<i>Rosa</i>	4	15
<i>Carpinus</i>	3	7	<i>Juglans</i>	2	3	<i>Ruscus</i>	1	1
<i>Catananche</i>	1	1	<i>Juniperus</i>	3	7	<i>Salix</i>	2	2
<i>Celastrus</i>	1	1	<i>Kalmia</i>	1	1	<i>Salvia</i>	4	4
<i>Celtis</i>	2	2	<i>Knautia</i>	1	1	<i>Sambucus</i>	2	2
<i>Centaurea</i>	1	1	<i>Koeleruteria</i>	2	2	<i>Sanguisorba</i>	1	1
<i>Cephalotaxus</i>	1	1	<i>Kobleria</i>	2	2	<i>Samvitalia</i>	1	10
<i>Cercis</i>	2	20	<i>Laburnum</i>	1	3	<i>Sapium</i>	1	1
<i>Cercocarpus</i>	1	1	<i>Lapeirusia</i>	1	1	<i>Scabiosa</i>	1	2
<i>Chaenomeles</i>	1	1	<i>Larix</i>	2	4	<i>Scilla</i>	1	1
<i>Chaerophyllum</i>	1	2	<i>Ligustrum</i>	2	21	<i>Securinega</i>	1	1
<i>Chamaebataria</i>	1	1	<i>Lilium</i>	2	2	<i>Shepherdia</i>	1	1
<i>Chamaecyparis</i>	1	1	<i>Lonicera</i>	5	6	<i>Silene</i>	1	1
<i>Cheiranthus</i>	1	2	<i>Lycium</i>	1	1	<i>Simsia</i>	1	1
<i>Chrysanthemum</i>	1	2	<i>Lytbrum</i>	1	1	<i>Sorbus</i>	8	27
<i>Cistus</i>	1	1	<i>Maaackia</i>	1	1	<i>Sphaeralcea</i>	1	1
<i>Clematis</i>	1	1	<i>Malus</i>	5	10	<i>Spiraea</i>	1	1
<i>Coleus</i>	2	10	<i>Malva</i>	1	3	<i>Staphylea</i>	1	1
<i>Colutea</i>	1	1	<i>Metasequoia</i>	1	1	<i>Symphytum</i>	1	1
<i>Cornus</i>	7	16	<i>Mimulus</i>	1	1	<i>Syringa</i>	4	4
<i>Corylus</i>	1	1	<i>Mirabilis</i>	1	1	<i>Tagetes</i>	1	5
<i>Cotoneaster</i>	8	11	<i>Morus</i>	1	1	<i>Taxus</i>	1	4
<i>Crataegus</i>	6	8	<i>Mucuna</i>	1	1	<i>Tbuja</i>	2	6
<i>Cytisus</i>	4	5	<i>Muretia</i>	1	2	<i>Tithonia</i>	1	1
<i>Delphinium</i>	2	4	<i>Myrica</i>	1	1	<i>Tripterygium</i>	1	1
<i>Deutzia</i>	1	1	<i>Mytilaria</i>	1	1	<i>Tulipa</i>	1	1
<i>Dianthus</i>	8	23	<i>Nyssa</i>	1	2	<i>Ulmus</i>	4	12
<i>Diospyros</i>	1	3	<i>Onoseris</i>	1	1	<i>Vaccinium</i>	1	1
<i>Duchesnea</i>	1	1	<i>Ostrya</i>	1	12	<i>Verbena</i>	1	1
<i>Elaeagnus</i>	2	4	<i>Oxydendrum</i>	1	1	<i>Viburnum</i>	7	16
<i>Eucommia</i>	1	1	<i>Paeonia</i>	1	1	<i>Viola</i>	1	1
<i>Euonymus</i>	4	17	<i>Paulownia</i>	1	1	<i>Weigela</i>	4	5
<i>Evoidia</i>	1	1	<i>Peganum</i>	1	1	<i>Wisteria</i>	1	1
<i>Foresteria</i>	1	1	<i>Penstemon</i>	17	39	<i>Xanthoceras</i>	1	2
<i>Forsythia</i>	1	2	<i>Peperomia</i>	1	1	<i>Yucca</i>	1	6
<i>Fraxinus</i>	7	24	<i>Petalostemum</i>	1	1	<i>Zelkova</i>	1	1
			<i>Petteria</i>	1	2	<i>Zinnia</i>	5	23
			<i>Pbellodendron</i>	2	3	TOTALS	349	706

variability inherent in the original seed received at the NCRPIS. Hand pollinations are used for pumpkins (*Cucurbita pepo* L.), sunflower (*Helianthus annuus* L.), and corn (*Zea mays* L.). Insects in cages are utilized for controlled pollinations of alfalfa (*Medicago* spp.), cucumber (*Cucumis sativa* L.), carrot (*Daucus carota* L.), wild sunflowers (*Helianthus* spp.), and parsley (*Petroselinum crispum* (Mill.) Nym.). Garden tomatoes and *Panicum*, are naturally self-pollinated. Amaranths are selfed by bagging the heads.

ORNAMENTALS COLLECTION

The NCRPIS also maintains a diverse collection of ornamental plants (Table 5). Most of the collection is composed of hardy trees and shrubs, although there are also collections of herbaceous annuals and perennials. Hardy trees and shrubs are obtained, propagated, and maintained in seed storage or as plants, as part of a cooperative program throughout the region to search out and test landscape plants

that have potential merit in the North Central region and are new to the nursery trade.

This NC-7 Regional Ornamental Plant Trials Program was established in 1954 with the goal of expanding the range of useful landscape plants adapted to midwestern conditions (Bhella 1979). Since 1954, trees and shrubs have been distributed annually for 10 years of field testing by trial cooperators. Presently there are over 30 sites, with widely differing environmental conditions, cooperating in this project.

After the 10-year testing period, results describing field performance at the various trial sites are summarized and published (Bhella 1983). Many useful plants have been introduced to the nursery trade and publicized through this project, including the 'Cheyenne' privet (PI 107630), 'Meadowlark' forsythia, and 'Smokey' dianthus (selected from PI 371894).

Currently, much of the effort in this program is directed toward propagating and testing new collections from Japan and China. In

1981, a major collecting expedition to northern Japan was undertaken by researchers at the National Arboretum, Washington, D.C., and the late Dr. Makota Kawase, who was a former regional ornamental trial cooperator from Ohio. We are optimistic that collections made there will broaden the range of trees and shrubs that may be used in landscape and conservation plantings and in forestry in Iowa and surrounding states.

Although recent efforts have centered on overseas introductions, in future years more emphasis will be placed on the collection of native species. Dr. Harold Pellett, a trial cooperator from Minnesota, is collecting native trees and shrubs primarily from populations growing under the extreme environmental conditions that may occur at the edges of a species' range. A network of botanists, horticulturists, and other interested individuals is being established to expand this effort to locate promising native material.

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