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Missouriensis is the official publication of the Missouri Native Plant Society. Founded in 1979 as a non-profit corporation, the Society is devoted to the conservation and study of the plants growing wild in Missouri, to the education of the public about the significance of the native flora and its habitat, and to the publication of related information.

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*CYNOCTONUM MITREOLA* REDISCOVERED IN MISSOURI

1

2

Timothy Nigh and Douglas Ladd

Miterwort, *Cynoctonum mitreola* (L.) Brit., is a diminutive annual in the Loganiaceae historically known from Butler and Dunklin counties in southeastern Missouri. According to Steyermark (1963), the only Missouri collection made in this century was from a swamp in Butler County in 1905. Wilson (1984) designates the plant "possibly extirpated" in the state.

On 13 August 1987, while evaluating a high quality fen complex in Ripley County, we discovered a population of *Cynoctonum mitreola* growing in an unusual marly gravel seepage flat peripheral to a deep muck fen. The plants occurred as scattered individuals in a sparse open turf of *Rhynchospora capillacea*, associated with *Ludwigia microcarpa*, *Physostegia angustifolia*, and *Scleria verticillata*. The area is constantly supplied with minerotrophic seepage percolating through residuum on the adjacent slope, which drains through the marly area into the deep muck fen. The fen is stratigraphically situated near the contact between the Gasconade and Roubidoux formations. Approximately 15 flowering *Cynoctonum* plants were scattered through the saturated lower portions of this seepage area, especially along a small rivulet. Several plants had nearly mature fruits.

1

Missouri Department of Conservation, Jefferson City, MO 65102.

2

The Nature Conservancy, Missouri Field Office, St. Louis, MO 63144.

This fen habitat for *Cynoctonum* is apparently anomalous, since the main range of the plant is south of the generally accepted range of fen occurrence. Typical habitats for *Cynoctonum* in the southeastern states include moist argillaceous or arenaceous substrates along ditches, banks and shores, as well as in open swampy or marshy areas. The range is generally given in most manuals as extending from Florida to Texas, north to Virginia, Tennessee and Arkansas, as well as in Mexico and the West Indies. McGregor (1986) describes it as "rare but locally common" in Woods County, in northwestern Oklahoma.

Being an annual, it is expected that local populations would be restricted to open areas like marl flats and shores where there would be sufficient open substrate for new plants to become established each year.

According to Nelson (1980), the correct name for this plant is *Mitreola petiolata* (J. F. Gmelin) Torr. & Gray. A voucher specimen is deposited at the Morton Arboretum, Lisle, Illinois (MOR) with the following label data:

MISSOURI: RIPLEY COUNTY. Open seeping marly gravel flat bordering deep muck fen at northwest edge of westernmost fen of Mud Branch Fen complex, near center of NW 1/4 sec. 32 T25N, R3E, 13 August 1987, Ladd & Nigh 12259 (MOR).

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Flower in the crannied wall,  
I pluck you out of the crannies,  
I hold you here, root and all, in my hand,  
Little flower, - but *if* I could understand  
What you are, root and all, and all in all,  
I should know what God and man is.

Tennyson (1908)

Shed no tear - O shed no tear!  
The flowers will bloom another year.  
Weep no more - O weep no more!  
Young buds sleep in the root's white core.

Keats, *Fairy's Song*, (1818)

## PROPAGATING ROSE VERBENA FROM CUTTINGS

1

Mervin Wallace

Rose Verbena [*Verbena canadensis* (L.) Britt.], is a showy perennial that blooms from March to November with peaks in spring and fall. It is found throughout southern and central where it grows on limestone glades, bluffs, wooded slopes and openings as well as in prairies and along railroads (Steyermark, 1963). The flowers vary from purple, blue, or lilac, to rose-red. A single stemmed eight-inch plant can increase under cultivation to cover about four square feet in a single growing season. This weak-stemmed plant trails over the ground, seldom exceeding one foot in height and may root where stems touch soil. It grows well in full sun to partial shade and in dry to average soil.

By now you are interested -- you want this long blooming native perennial growing in front of your sunny dry flower bed or rock garden. You don't want to dig it up from the place where you know it is growing wild. (No, you don't.!) You can collect seeds if you are lucky enough to catch them before they fall from the plant, but there is a faster way to get large plants without digging. By following the steps described below, you can produce Rose Verbena and many other plants from cuttings.

Rose Verbena typically has peak flowering in April and May followed by considerable vegetative growth until late August when it will begin to flower again if conditions are

favorable. It is during the vegetative growth period, July and early August, that cuttings can easily be taken and rooted. The weak growing stems lie horizontally on the ground except for the last four to six inches which stand vertically. Cuttings should include all of the vertical tip of a stem plus one to two inches of the horizontal portion. A good cutting will have one or more small tan or white lumps on the lower side of the stem near the curve of the stem. These lumps rapidly grow into healthy roots in about ten days if the cuttings are provided with the right conditions.

The cuttings should be plunged into a bucket of water immediately after being removed from the parent plant. They can be left in the bucket of water for one or two hours or transferred to a plastic bag until you get home to finish the process.

Rose Verbena cuttings will not root in water alone. The stems apparently get not get enough oxygen under water for root development to occur. A good rooting medium should hold lots of moisture and yet drain well. Equal parts peat moss and perlite or equal parts peat moss and sand can be used. Commercial potting mixes such as Pro-Mix BX can also be used successfully.

Fill a five or six inch plastic pot with wet potting mix. Remove the leaves from the lower one half of your cutting by pinching them off - not pulling. These leaves are pinched off to prevent disturbing any roots that are already forming when cuttings are taken. Make a hole in the potting mix, and place the cutting in to the first set of remaining leaves. Press the mix down around the stem to close the hole. Six to eight cuttings can be put in one five or six inch pot. Water the pot thoroughly from the top to further settle the potting mix around the

cuttings. From the time the stems are removed from the parent plant to this point the cuttings should be kept moist. Next place the entire pot in a plastic bag and close the top or invert a tight fitting plastic bag over the pot. In either case make a one inch diameter hole in the bag to allow some air exchange. The plastic bag slows transpiration of water from the leaves until the stem has developed a new root system that can support normal water loss from the plant. Keep the cuttings out of direct sunlight until removed from the bag.

In about ten days some of the cuttings will have four to five inch roots with several branches. These should be removed from the pot and planted individually in three to five inch pots. In about ten more days, the rest should be ready to remove. By early fall your cuttings should be ready to plant in their permanent location. They may even be flowering by this time.

The procedure described above will also work to root many herbaceous perennial plants. The procedure can be varied slightly to better suit some species. Unlike the Rose Verbena, many cuttings benefit from having leaves pulled off. Pulling the leaf off usually tears away part of the epidermis of the stem. In some species roots form along the torn or bruised areas of stems. Some species such as Buttonbush (*Cephalanthus occidentalis* L.) root easily in water. Plants rooted in water do not need a plastic cover to keep the humidity up around their leaves.

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HAVE YOU THANKED  
A  
PLANT TODAY?

## VEGETATION OF KNOB NOSTER STATE PARK I.

## MAJOR PHYSIOGNOMIC COMMUNITIES

1

2

Ron Mullikin and David Castaner

Knob Noster State Park is approximately 10 miles east of Central Missouri State University in Johnson County. It is the purpose of this paper to outline the major "physiognomic" communities of the park. Physiognomic communities are defined as those largest discernible communities that are "visually" distinct (woods, grasslands, etc.). These descriptions are by design limited in scope. It is hoped, however, that this paper will give the reader a general idea of the vegetation of Knob Noster State Park. For more detailed information about community designations in Missouri and Knob Noster State Park, the reader is urged to examine publications by Nelson (1985) and Thom & Iffrig (1985).

## Historical Background

In 1927, Knob Noster State Park was designated as the Monserrat National Recreation Demonstration Area. During the depression it was developed by the National Park Service under the Emergency Relief Act. It was home and provided work for about 150 men. Two camps, Camp Bob White located in the southwestern portion of the park, and Red Cedar in the

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northwestern section, were constructed during that period. Camp Red Cedar was later renamed Camp Shawnee. Each camp was provided with a pool, lodges, cabins, and dining hall for gatherings of nonprofit organizations.

On February 5, 1946, the National Park Service turned the area over to the Missouri Park Board and the name Knob Noster State Park was given to the area. Although the park grounds were characterized as unfit for farming, it was one of the few natural woodland areas of beauty and variety within 100 miles of Kansas City. Thus it was a natural choice for a state park (Syron, Beltram and Cobb, 1971).

Today Knob Noster State Park provides areas for recreational camping and hiking. A large primitive camping area has been set aside near Clearfork Creek. Workers of the WPA (Work Projects Administration) constructed all the permanent fish-stocked lakes and ponds, including Clearfork Lake, Redbud Lake, Sullivan Pond, Lake Morel, and Lake Buteo. Wide trails were also built but were not subsequently kept up until recent years. Savanna and prairie restoration are prime goals of the Department of Natural Resources. Recreational opportunities include boating, fishing, nature trails (reworked during the 1970's), swimming, picknicking, horseback riding, and camping for large or small groups.

### Geology and Physiography

The last glacial encroachment (Kansan Ice Sheet) of the Pleistocene epoch pushed as far south as the Missouri River altering climatic conditions south of the ice sheet. Pollen studies of bogs in similar locations in the United States suggests that the Knob Noster area probably had a tundra-like vegetation

(Harshbarger, 1958). As the ice sheet retreated and climatic conditions moderated, deciduous forest species from southern refugia, especially the Ozarks, invaded and became established.

Knob Noster State Park lies along a north-south anticline with the Knob Noster Quadrangle. The park drains towards the north-northeast along the meandering Clearfork Creek at a gradient of about four feet per mile. The Clearfork has a wide flood plain that includes at least one ox-bow lake and one ox-bow slough (Pin Oak Slough Natural Area). The maximum elevation in the park is 325.1 meters (905 feet) in the western section along Bristle Ridge and decreases slowly eastwardly towards the Clearfork Creek Valley where the lowest elevation is 255.9 meters (710 feet). The ridges and hillsides are characterized by thin soils with many rock outcrops of limestone and sandstone.

### Regional Physiognomy

Transeau (1935) described the large mid-western prairie area encompassing one-half of Missouri extending into Illinois and Indiana (and isolated places in Ohio) as the "prairie peninsula." This "peninsula" is characterized as having woodland species along streams and much of the uplands but is climatologically suited for prairie (according to Transeau). Weaver (1954) has stated that prairie is found within the precipitation limits of 58-102 cm (23-40 inches) rainfall/year. Knob Noster State Park receives approximately 91 cm (36 inches) rainfall/year and thus supports prairie (more likely man-induced than climatic). Schroeder (1981), in his Map 4 illustrating presettlement prairie in Missouri, shows most of Johnson County in prairie, with extensive forests along the Clear Fork River in what is now the park. The presence of "prairie" species in the heavily



wooded park indicates a varied ecological history.

### Brief Description of Major Physiognomic Communities

For the purposes of this study, we have divided the park's vegetation into five basic physiognomic types: Those dominated by trees (with at least 30% cover) are considered (1) wooded uplands, and (2) wooded lowlands; those with less than 30% cover are considered (3) open uplands, and (4) open lowlands; those associated with water are called (5) wet areas (Figure 1). The names of species in the following discussion follows Steyermark (1963).

#### (1) Wooded Uplands

The upland wooded areas are characterized by tree covered ridges and slopes. The soils of the upper wooded areas are thin, poor, and well-drained and thus drier than the lower slopes and valleys where more moisture holding humus has developed.

On ridge-tops, the (Figure 2, 1) Importance Values (Curtis and McIntosh, 1951) of the two most dominant tree species are 70 for Post Oak (*Quercus stellata*) and 58 for Shagbark Hickory (*Carya ovata*). Other trees present include Red Oak (*Q. rubra*) 39, Slippery Elm (*Ulmus rubra*) 19, and Mockernut (*C. tomentosa*) 18). Post Oak is considered the climax tree in this type of community where it may attain importance values up to 170 (Carter, 1981).

On the slopes, in addition to the trees noted above, other species occur in the canopy and understory vegetation (Figure 2, 11). These include Bitternut (*Carya cordiformis*), Mockernut, Bur Oak (*Quercus macrocarpa*), Chestnut Oak (*Q. prinoides*), Red Mulberry (*Morus*

*rubra*), Osage Orange (*Maclura pomifera*), Serviceberry (*Amelanchier arborea*), Hophornbeam (*Ostrya virginiana*), Black Cherry (*Prunus serotina*) and Persimmon (*Diospyros virginiana*) (Figure 2, II).

On disturbed areas in the uplands where much erosion has occurred Black Jack Oak (*Quercus marilandica*) and Black Locust (*Robinia Pseudo-Acacia*) can be found. Ground cover is sparse and includes such species as Long-bracted Wild Indigo (*Baptisia leucophaea*) and Bent Milk Vetch (*Astragalus distortus*). Shingle Oak (*Quercus imbricaria*) grows often at the edges of cleared fields and lots.

In the more heavily wooded areas, shade tolerant understory species include Yellow Star Grass (*Hypoxis hirsuta*), Early Buttercup (*Ranunculus fascicularis*), Rue Anemone (*Anemonella thalictroides*), Indian Physic (*Gillenia stipulata*), Flowering Sumac (*Rhus aromatica*), Beard-tongue (*Penstemon pallidus*), Pussy's-toes (*Antennaria plantaginifolia*), and Prairie Ragwort (*Senecio plattensis*).

## (2) Wooded Lowlands

The moist lowland wooded areas have the most favorable growing conditions and consequently support a more diverse vegetation. The wooded lowlands communities are found mainly in the Clearfork Creek bottoms and the ravines that drain into Clearfork Creek on the east and west.

A tree community much different from the Wooded Uplands develops in the Lowlands. Species encountered in this community include Bitternut (*Carya cordiformis*), Kingnut (*C. laciniosa*), Swamp White Oak (*Q. bicolor*), American Elm (*Ulmus americana*), Slippery Elm, Persimmon (*Asimina triloba*), Honey Locust (*Gleditsia*

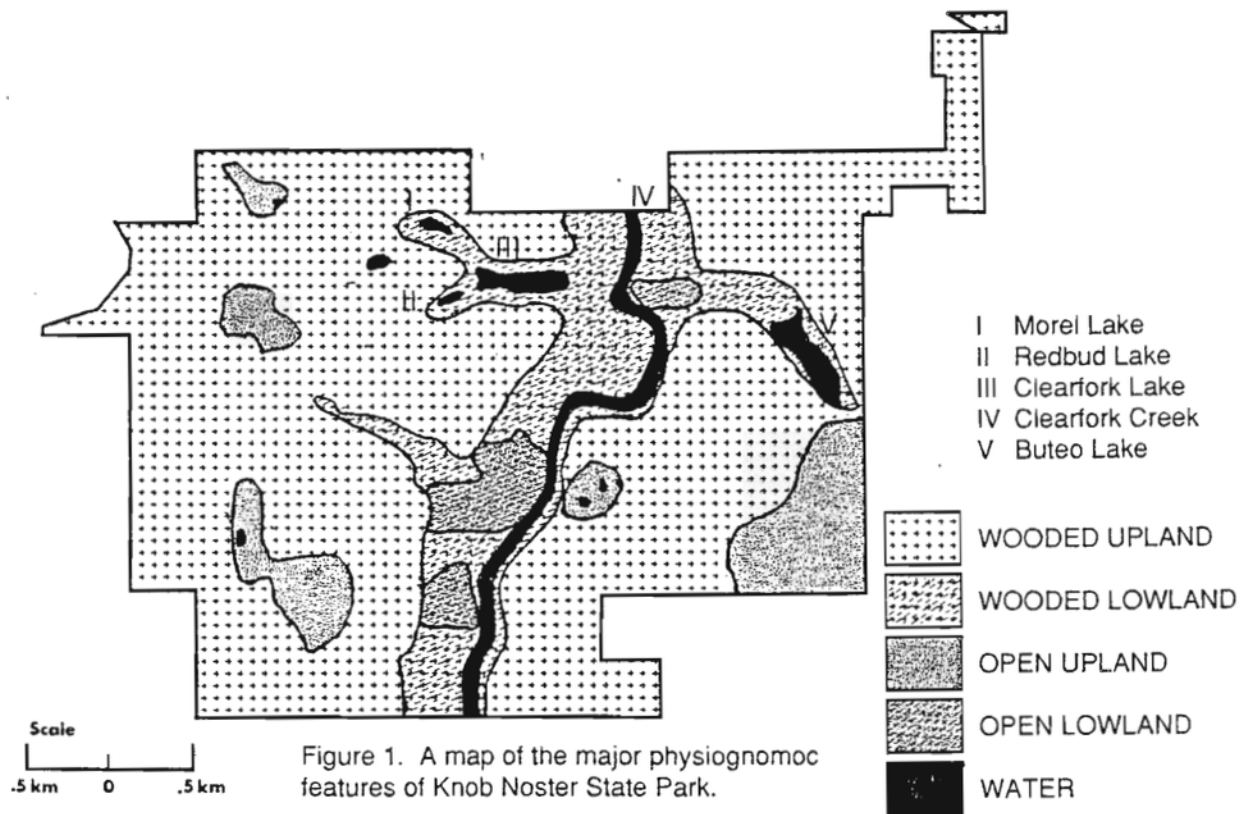


Figure 1. A map of the major physiognomic features of Knob Noster State Park.

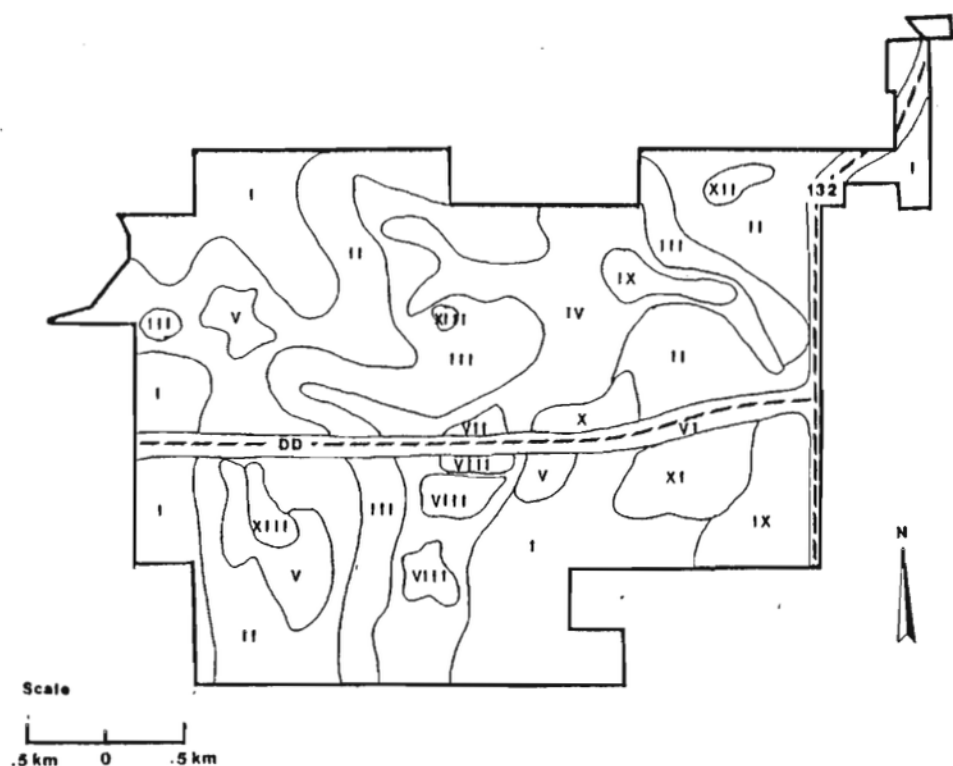


Figure 2. Vegetation subdivisions of Knob Noster State Park. I. Oak-Hickory (dominant). II. Oak-hickory (intergrading with other species). III. Elm important. IV. Sycamore-Maple-Box Elder. V. Grasses-Milkweed-Goldenrod. VI. Grasses-Sunflowers-Legumes (roadsides). VII. Sedges. VIII. Grasses-Box Elder-Sycamore. Additional subdivisions of interest are IX. Bluegrass-Chickweed-Dandelion (mowed areas). X. White Oak stands. XI. Hickory Stands. XII. Black Locust stand. XIII. Pine plantings.

*triacanthos*), Red bud (*Cercis canadensis*), Bladdernut (*Staphylea trifolia*), Ohio Buckeye (*Aesculus glabra*), Basswood (*Tilia americana*), Rough-leaved dogwood (*Cornus drummondii*), and Swamp Dogwood (*Cornus obliqua*) (Figure 2, III). Large clonal colonies of *Rubus* species interwoven Poison Ivy, (*Rhus radicans*) are frequently present.

An important community associated with the lowland is the abandoned oxbow or slough community. Pin Oak Slough Natural Area is an area dominated by the park's tallest Pin oaks. Associated trees include Silver Maple, Bur Oak, and Swamp White Oak (Thom, 1985). Large colonies of Buttonbush (*Cephalanthus occidentalis*), Sensitive Fern (*Onoclea sensibilis*), *Carex hyalinolepis*, *C. mushingumensis*, and the Hop Sedge (*C. lurida*) are commonly present. The Pale Green Orchid (*Habenaria flava* var. *herbiola*) maintains itself grows among the Hop Sedges. The park's only specimen of Sweet Gum (*Liquidambar styraciflua*) is found close to the slough. The origin of this Sweet Gum is unknown. It is solitary and away from any human artifact. However, it is commonly planted as an ornamental in the area.

Common species of the canopy and understory of the river bottoms and streams emptying into the Clearfork Creek are Black Willow (*Salix nigra*), Cottonwood (*Populus deltoides*), River Birch (*Betula nigra*), American Elm, Hackberry (*Celtis occidentalis*), Sycamore (*Platanus occidentalis*), Kentucky Coffeetree (*Gymnocladus dioica*), Silver Maple (*Acer saccharinum*), and Box Elder (*A. Negundo*) (Figure 2, IV).

The moist areas above the primary flood plain of the Clearfork Creek at the base of slopes and near stream beds are habitats for a variety of plants. Some of these are

Rattlesnake Fern (*Botrychium virginianum*), Spike Grass (*Uniola latifolia*), Wood Reed Grass (*Cinna arundinacea*), Indian Turnip (*Arisaema atrorubens*), Day Flower (*Commelina communis*), Wake-Robin (*Trillium sessile*), False Nettle (*Boehmeria cylindrica*), May Apple (*Podophyllum peltatum*), Gooseberry (*Ribes missouriense*), White Avens (*Geum canadense*), Agrimony (*Agrimonia eupatoria*), Harbinger-of-Spring (*Erigeron phillyriaefolius*), Wild Sweet Williams (*Phlox divaricata*), Stickseed (*Hackelia virginiana*), Heal All (*Prunella vulgaris*), Blue-eyed Mary (*Collinsia verna*), and Tall Bellflower (*Campanula americana*). Ferns such as the Christmas Fern (*Polystichum acrostichoides*), the Maidenhair Fern (*Adiantum pedatum*), and the Wood Fern (*Woodsia obtusa*) can be found on east or north facing slopes of this and upland habitats.

Species found in the direct flood plain of the Clearfork Creek include Creeping Love Grass (*Eragrostis hypnoides*), Indian Turnip, Wild Ginger (*Asarum canadense*), Swamp Buttercup (*Ranunculus septentrionalis*), Wild Geranium (*Geranium maculatum*), Woollen Breeches (*Hydrophyllum appendiculatum*), Virginia Bluebells (*Mertensia virginica*), Beggar's Ticks (*Bidens frondosa*), and Burdock (*Arctium minus*).

### (3) Open Uplands

The upland open areas are of two types in Knob Noster State Park. Some are old abandoned fields, where succession to upland forest is occurring, and maintained roadsides.

Species often found in upland clearings are Big Blue Stem, (*Andropogon gerardi*), Brome Sedge (*A. virginicus*), Partridge Pea (*Cassia fasciculata*), Whorled Milkweed (*Asclepias verticillata*), and Late Goldenrod (*Solidago gigantea*) (Figure 2, V).

Roadsides provide wide areas between upland woods and the pavement. Periodic mowing (usually twice a year) prevents encroachment by tree species. In such artificially maintained habitats commonly found species include Brome Sedge, Smooth Brome (*Bromus inermis*), Downy Brome (*B. tectorum*), *Carex bushii*, *Allium mutabile*, Blue-eyed Grass (*Sisyrinchium campestre*), Thyme-leaved Sandwort (*Arenaria serphyllifolia*), Deptford Pink (*Dianthus armeria*), Prairie Larkspur (*Delphinium virescens*), Early Water Aven, Prairie Clover (*Petalostemon purpureum*), Common Mullein (*Verbascum thapsus*), Moth Mullein (*Verbascum blattaria*), Wild Petunia (*Ruellia humilis*), St. John's Wort (*Hypericum perforatum*), and Goat's Beard (*Tragopogon dubius*) (Figure 2 VI).

#### (4) Open Lowlands

The lowland open areas of the park consists of abandoned fields and low areas along Clearfork Creek. On the north side of DD highway near Clearfork Creek is a clearing in a lowland woods that has standing water much of the time in the spring. Species associated with this area are Common Bulrush (*Scirpus atrovirens*), *S. lineatus*, Fox Sedge (*Carex vulpinoidea*), *C. conjuncta*, *C. tribuloides*, *C. shortiana*, *C. squarrosa*, and Hop Sedge (*C. lupulina*) (Figure 2 VII).

Wood Reed Grass (*Cinna arundinacea*) dominates an abandoned field south of DD highway along Clearfork Creek. *Carex davisii*, an adventive sedge often found along roadsides, is also common in this abandoned field.

Species commonly encountered along highways include Japanese Brome (*Bromus japonicus*), *Carex molesta*, White Clover (*Trifolium repens*), Wood Sage (*Teucrium canadense*), and the Sunflower (*Helianthus*

*hirsutus*) (Figure 2 VIII).

In mowed areas, especially in the primitive campgrounds, common species include Kentucky Bluegrass (*Poa pratensis*), *Panicum dichotomiflorum*, Jagged Chickweed (*Holosteum umbellatum*), Peppergrass (*Lepidium virginicum*), Smooth Yellow Violet (*Viola pensylvanica*), Hedge Parsley (*Torilis japonica*), Bluet (*Houstonia minima*), and Common Dandelion (*Taraxacum officinale*).

#### (5) Wet Areas

There are many species which are associated with ponds and lakes and their borders. Lesser Duckweed (*Lemna minor*) is found free floating only on Lake Buteo. Floating Primrose Willow (*Jussiaea repens*) is found at the water's edge and extending out across shallow water of almost every pond and lake.

During the spring rains many species become partially inundated. These include Common Cattail (*Typha latifolia*), the Spikerushes (*Eleocharis obtusa* and *Eleocharis smallii*), and the Rush, *Juncus acuminatus*. Other species found on the borders of ponds and lakes are Black Willow (*Salix nigra*), Lady's Thumb (*Polygonum persicaria*), Ditch Stonecrop (*Penthorum sedoides*), Mint (*Mentha spicata*), Bedstraw (*Galium* spp.), and Buttonbush (*Cephalanthus occidentalis*). These species also occur in upland ponds. Arrowhead (*Sagittaria engelmanniana*) can be found in ponds where the water levels recede in the drier summers. Touch-me-not (*Impatiens capensis*) can be found growing in the muddy flats at the mouth of the dried streams that empty into the upland lakes (Figure 2, IV).



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**Note of Interest**

Jean-Baptiste Duerinick (1809-1857) was a Belgium Jesuit missionary in the middle western United States. He collected plants in St. Louis and neaby Illinois between 1826 and 1840. A sketch of his life is found in a paper by L. J. Dorr (Bull. Jard. Bot. Nat. Belg. Bull. Nat. Plantentuin Belg. 56: 397-416. Dorr is on the staff of the Missouri Botanical Garden.

# NOMENCLATURAL REVIEW OF THE FAMILIES CERATOPHYLLACEAE AND NYMPHAEACEAE IN MISSOURI

1

Joanna Turner

## CERATOPHYLLACEAE S. F. Gray (Hornwort Family)

The genus *Ceratophyllum* in the monogeneric family Ceratophyllaceae has been considered by some authors to be comprised of only one cosmopolitan species with varying numbers of intergrading forms, and by others to have more than thirty species. Lowden (1978) stated that the rather localized distribution of *Ceratophyllum* has contributed to the description of a number of species which are actually variants of the same species. This is evident when the worldwide range of the genus is considered.

According to Lowden, no differences exist between Asa Gray's 1837 description of *C. echinatum* and Chamisso's 1829 description of *C. muricatum*; thus the earlier name has priority. Accordingly he recognized the genus to include three species: *Ceratophyllum muricatum* Cham. (= *C. echinatum* A. Gray) and *C. demersum* L., the two Missouri taxa, and *C. submersum* L., confined in the United States to Florida. Other authors (Lowden and Wooten, 1980; Mohlenbrock, 1986; and Godfrey and Wooten, 1981) have all concurred in this arrangement. Fassett (1957) recognized only one taxon, *C. demersum*, saying it was widely distributed and very variable in length and degree of crowding of leaves. Smith (1978), Kaul (1986), and Correll and Correll (1972) all

recognized only two taxa, *C. demersum* and *C. echinatum*, with no reference to *C. muricatum*. Wood (1959) stated there were six or more species in this genus with three in the southeastern United States: *C. demersum*, *C. echinatum*, and *C. floridanum*. Voss (1985) cited both Fassett and Lowden as references but retained *C. echinatum*, noting that it is sometimes included in the Old World *C. muricatum*. He pointed out the difficulties of distinguishing one species from another, as did Cook et al. (1974), who felt the more than thirty species described worldwide were no more than local variants of *C. demersum* and *C. submersum*. However, they gave no synonymy or varieties. Webb (1964) recognized four species for Europe, including *C. demersum*, *C. submersum*, and *C. muricatum*. Cronquist (1981) noted that *Ceratophyllum* "has about 6 species, of cosmopolitan distribution."

In a recent worldwide study, Wilmot-Dear (1985) determined that although other treatments of this genus recognized three to four species (although not always the same taxa), all of them, in at least one region, showed variants intermediate with one another. She concluded that there are only two species, *C. demersum* and *C. submersum*, and that *C. muricatum* should be considered a subspecies of *C. submersum*. Since Gray was the first to recognize this taxon as a variety, his epithet *echinatum* has priority at the varietal rank. According to Wilmot-Dear, Missouri material would consist of the following:

*Ceratophyllum demersum* L. var. *demersum*  
f. *demersum*

*Ceratophyllum submersum* L.  
subsp. *muricatum* (Cham.) Wilmot-Dear  
var. *echinatum* (A. Gray) Wilmot-Dear  
(= *C. muricatum* Cham., *C. demersum*

var. *echinatum* (A. Gray) A. Gray and  
*C. echinatum* A.Gray).

Wilmot-Dear separated these two species by the following key (p. 256):

Leaves 1-2 forked (rarely on lower part of main axis, 3 (-4) forked), rarely delicate, most usually robust, rigid, and brittle, with marginal teeth along the leaf segment often many and prominent.

. . . . . *C. demersum*

Leaves, at least the majority in all parts of the plant, 3-4 forked, delicate, marginal teeth few and inconspicuous.

. . . . . *C. submersum*

Steyermark (1963, p.663) followed Fassett's revision of the family, using *C. demersum* and *C. echinatum*. However, acceptance of Wilmot-Dear's recent revision would require that his taxon *C. echinatum* be included as a variety of *C. submersum* subsp. *muricatum*.

Les (1985, 1988) has recently presented evidence that Wilmot-Dear's merger of *C. echinatum* with *C. submersum* is not warranted, and his treatment of Missouri material would be in agreement with that of Steyermark. Thus the controversy over this complex genus continues.

#### NYMPHAEACEAE

There has long been a debate over the taxonomic status of the family Nymphaeaceae. Some authors felt it should be maintained in a broad sense, including Steyermark (1963, p. 664). However, many recent authors have treated it as three distinct families, the Nelumbonaceae, Cabombaceae, and Nymphaeaceae. Cronquist (1981) placed *Nelumbo* in the Nelumbonaceae and *Brasenia* and *Cabomba* in the

Cabombaceae, with all three families in the order Nymphaeales. Mohlenbrock (1986), Kaul (1986), Godfrey and Wooten (1981), and Cook et al. (1974) all recognize these three families.

Takhtajan (1980) not only accepted the three families but placed the Nelumbonaceae in a separate order, the Nelumbonales, and in a different superorder Nelumbonae. Thorne (1983) also accepted the three families, with Cabombaceae and Nymphaeaceae in the order Nymphaeales, superorder Nymphaeaeiflorae, and the Nelumbonaceae in a different order (Nelumbonales) and in a different superorder (Annoniflorae). Thorne stated that despite the similarity in habitat and growth habit of *Nelumbo* and the Nymphaeales, they differ in stem anatomy (*Nelumbo* has primitive vessel elements, while the Nymphaeales have no vessels or only specialized ones in *Cabomba*) and in pollen grains (*Nelumbo* has tricolpate grains; the Nymphaeales, monosulcate or monosulcate-derived grains). He pointed out that distinct serological and other phytochemical differences have been found, and similarities of *Nelumbo* to the Annonales and Berberidales have been noted. Mabberly (1978), although not splitting the Nymphaeaceae, referred to *Nelumbo* as differing so much that it is thought by many to be allied to *Podophyllum* (Berberidaceae). Mabberly (1987) accepted the segregate families.

Voss (1985) maintained the family Nymphaeaceae with three distinct subfamilies but recognized that there are arguments on the question of rank that could support both points of view. Hutchinson (1973) retained *Nelumbo* in the Nymphaeaceae while recognizing Cabombaceae as a separate family. Beal (1980), Wood (1959), Smith (1978), Correll and Correll (1972), and Fassett (1957) did not recognize any segregate families. If one chooses to accept the segregated families, the following key, adapted

from Cronquist (1981, p. 105) and Voss (1985, p. 189) may be used to distinguish them:

Carpels not embedded in the receptacle

Plants acaulescent (without an evident stem), leaves all simple and rising directly from rhizomes, usually with floating leaf-blades . . . Nymphaeaceae

Plants with long, slender, leafy, distally floating stems in addition to the rhizomes, with or without floating leaf-blades, often with some or all of the leaves submerged and dissected.  
 . . . . . Cabombaceae

Carpels individually embedded in the enlarged, top-shaped receptacle, leaves and flowers borne above the surface of the water . . . . . Nelumbonaceae

Following this classification, the following changes in nomenclature have been proposed:

NYMPHAEACEAE Salisbury (Water Lily Family)

*Nuphar lutea* (L.) Sibth. & Smith

Voss pointed out that the generic name of this taxon was feminine as originally published and is treated as such in the conserved names, but the use of *luteum* with the neuter ending has persisted. Rickett and Stafleu (1959) further explained that J. E. Smith adopted the feminine gender for *Nuphar* and since this is an Arabic work turned into Greek by Dioscorides, not a classical word, the choice of Smith was adopted under Rec. 75 (A) 3.

There seems to be a great deal of confusion concerning the nomenclature and number of

species and subspecies of *Nuphar*. Beal (1956) recognized only a single polymorphic species, *N. lutea* (L.) Sibth. & Smith, with nine subspecies, including two found in Missouri: subsp. *macrophylla* (Small) E. Beal and subsp. *ozarkana* (Miller & Standley) E. Beal. Steyermark (1963) followed Beal's treatment, as did Beal (1980), Correll and Correll (1972), Kaul (1986) and Mohlenbrock (1986). Godfrey and Wooten (1981) also followed Beal but stated that according to Beal (no reference given), subsp. *ozarkana* is questionably distinguishable from subsp. *macrophylla*. Smith (1978) absorbed all subspecies. Voss (1985) disagreed with Beal's placement of all American taxa in this genus as subspecies of *N. lutea*, claiming that our plants are easily distinguished (much more so than the species usually recognized in *Nymphaea*), and he treats them as closely related species. He stated that *N. advena* (Aiton) Aiton f. has been called *N. lutea* subsp. *macrophylla* but under the Code as amended in 1981, it would have to be called subsp. *advena* (a combination not yet published) if treated at that rank. Voss (1984) further explained that at the 1981 Botanical Congress, autonyms were given new status and the 1912 autonym *Nymphoanthus advena* (Aiton) Fern. subsp. *advena* has to be treated as having priority over the previously accepted *N. lutea* subsp. *macrophylla*. Since Voss chooses to recognize it as a distinct species, he prefers the use of *N. advena*. Thus the taxa in Steyermark (1963) may be treated as follows:

*Nuphar lutea* (L.) Sibth. & Smith  
subsp. *macrophyllum* (Small) E. Beal  
= *Nuphar advena* (Aiton) Aiton f. cf.  
Voss 1985.

*Nuphar lutea* (L.) Sibth. & Smith  
subsp. *ozarkanum* (Miller & Standley)  
E. Beal



*Nymphaea odorata* Aiton var. *odorata*

This is possibly the only species of this variable genus found in Missouri. Beal (1980) listed *N. odorata* var. *gigantea* Tricker and *N. tuberosa* Paine as synonyms under *N. odorata* var. *odorata*. Wood (1959) recognized the need for a critical study of *N. odorata*, and Voss (1985) cited studies indicating that differences between *N. odorata* and *N. tuberosa* did not hold up under investigation. Smith (1978) recognized only *N. odorata*, with no varieties. Godfrey and Wooten (1981) included *N. odorata* var. *odorata* and var. *gigantea* but pointed out the diversity in the latter and admitted their difficulty in assigning many species to either variety. Correll and Correll (1972) and Mohlenbrock (1986) used *N. odorata* (no varieties) and *N. tuberosa*.

## CABOMBACEAE A. RICHARD (Water Shield Family)

*Brasenia schreberi* J. Gmelin*Cabomba caroliniana* A.Gray.

No changes in nomenclature have been suggested for the two taxa in this family that occur in Missouri.

## NELUMBONACEAE Dumortier (Lotus Lily Family)

*Nelumbo lutea* (Willd.) Pers.*Nelumbo nucifera* Gaertner

Sohmer (1975) argued that the correct name for *Nelumbo lutea* (Willd.) Pers. is *N. pentapetala* (Walter) Fern. and this name was used by Cook et al. (1974). However, Sohmer's arguments were rejected by Ward (1977) and have

not been accepted by any other authors I consulted.

#### ACKNOWLEDGEMENT

I wish to thank Dr. Wallace R. Weber and Dr. Paul L. Redfearn, Jr., Department of Biology, Southwest Missouri State University, Springfield, MO 65804-0095, for their helpful suggestions on this paper.

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#### Notes on Research of Interest

Two Master's Theses recently completed at Southwest Missouri State University may be of interest to members of the Missouri Native Plant Society. These are:

The Bryophytes of Ha Ha Tonka State Park, Camden County, Missouri by Carol A. Fuller. 1986.

The Vascular Flora of Bona Glade Natural Area, Dade County, Missouri by Arlene J. Collett. 1987.

## MISSOURI BOTANICAL RECORD

Compiled and Edited

By

Wallace R. Weber\*, Jon P. Rebman\*, and William Corcoran\*\*

The *Missouri Botanical Record* is the official register for new county records of all vascular plant taxa in Missouri. To qualify for inclusion in this record, a voucher specimen of the record taxon must be deposited in a **recognized herbarium** and verified by the curator. Following the format used below, please submit all records to Dr. Wallace R. Weber, Department of Biology, Southwest Missouri State University, Springfield, MO., 65804.

With completion of the transfer of Steyermark's original distribution records to the mainframe computer at Southwest Missouri State University, we are now in the process of merging new records with the Steyermark data base. Over 800 new records are included in this issue of *Missouriensis*, with the remainder of the backlog due to be published in the next issue. As this is an ongoing project, all persons are urged to submit any records that have not yet been included. Although progress to this point has been slow, we feel confident that publication of records in the future will be more timely. One immediate goal is to provide **updated** county record lists to all who request them by sometime this summer. Remember, county record lists or lists of taxa **NOT** in a county, based on Steyermark's original data base, can already be obtained by request from the senior author.

Several minor changes in format have been initiated in this issue of the *MISSOURI BOTANICAL RECORD*. In previous issues, only a single map number from **Steyermark's Flora of Missouri** was associated with each species, even though several **subspecific taxa** were listed. In these instances, Steyermark used various symbols to represent each taxon on a single Missouri county map. A decimal system is now being used with .1 assigned to the first subspecific taxon listed by Steyermark under each map, .2 for the second, and so on. Point nine nine (.99) is used to designate a species in which Steyermark included one or more subspecific taxa, but which was not specified by the collector. Point zero nine (.09) identifies a taxon not included by Steyermark. Another change includes the use of abbreviations in the list of names. The letter v. and f. refer to variety and form respectively, while nv indicates that no subspecific category has been recognized.

Contributors for this issue include **Otto Ohmart**, Dept. of Biology, Southeast Missouri State University, Cape Girardeau, Missouri, 63701; and **Patrick DeLozier**, Kansas, City, Missouri.

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| MAP #  | TAXON                                         | COUNTY         | DATE     | COLLECTOR                        | HERB | 33 |
|--------|-----------------------------------------------|----------------|----------|----------------------------------|------|----|
| 10     | EQUISETUM ARVENSE NV                          | SCOTT          | 5/15/71  | J. BURGER (109)                  | SEMO |    |
| 10     | EQUISETUM ARVENSE NV                          | CALDWELL       | 5/19/83  | DELOZIER & RAVEILL (1974)        | UNMC |    |
| 10     | EQUISETUM ARVENSE NV                          | RAY            | 5/4/83   | DELOZIER & RAVEILL (1917)        | UNMC |    |
| 10     | EQUISETUM ARVENSE NV                          | WORTH          | 6/1/83   | DELOZIER & RAVEILL (1120)        | UNMC |    |
| 10     | EQUISETUM ARVENSE NV                          | LENN           | 5/18/84  | DELOZIER & ZELK (1545)           | UNMC |    |
| 12     | EQUISETUM LAEVIGATUM NV                       | CARTER         | 5/17/89  | J. P. HUCKABAY (NONE)            | SEMO |    |
| 13     | EQUISETUM HYEMALE NV                          | CALDWELL       | 5/19/83  | DELOZIER & RAVEILL (986)         | UNMC |    |
| 13     | EQUISETUM HYEMALE NV                          | CHARITON       | 8/8/83   | DELOZIER & RAVEILL (1451)        | UNMC |    |
| 14     | BOTRYCHUM DISSECTUM V. TENUIFOLIUM            | WAYNE          | 3/15/74  | S. BAUGHN (NONE)                 | SEMO |    |
| 15     | BOTRYCHUM VIRGINIANUM V. VIRGINIANUM          | NEW MADRID     | 5/8/71   | K. CLEMENT (109)                 | SEMO |    |
| 26     | PTERIDIUM AQUILINUM V. PSEUDOCAUDATUM         | STODDARD       | 7/19/69  | LUTES (83)                       | SEMO |    |
| 52     | ATHYRIUM PELIX-FEMINA NV                      | CLAY           | 8/1/83   | RAVEILL & MAGENKHECHT (1732)     | UNMC |    |
| 59     | DRYOPTERIS MARGINALIS NV                      | WAYNE          | 3/15/74  | B. BAUGHN (NONE)                 | SEMO |    |
| 67.99  | JUNIPERUS VIRGINIANA NV                       | SCOTT          | 6/23/67  | LUKER (22)                       | SEMO |    |
| 71     | TYPHA GLAUCA NV                               | SCOTT          | 7/9/74   | T. E. BROOKS (7413)              | SEMO |    |
| 90.99  | ALISMA PLANTAGO-AQUATICA V. PARVIFLORUM       | OALLAS         | 8/26/72  | S. A. SUTTER (827)               | SEMO |    |
| 90.99  | ALISMA PLANTAGO-AQUATICA V. PARVIFLORUM       | NEW MADRID     | 7/13/71  | K. CLEMENT (186)                 | SEMO |    |
| 94     | SAGITTARIA MONTEVIDENSIS NV                   | STODDARD       | 7/14/69  | J. LUTES (NONE)                  | SEMO |    |
| 97     | SAGITTARIA AMBIGUA NV                         | STODDARD       | 4/24/59  | R. SMITH (1)                     | SEMO |    |
| 111    | BROMUS RACEMOSUS NV                           | STE. GENEVIEVE | 5/23/75  | W. R. EDDLEMAN (NONE)            | SEMO |    |
| 112    | BROMUS SQUARROSUS NV                          | NEW MADRID     | 6/9/71   | K. CLEMENT (149)                 | SEMO |    |
| 113    | BROMUS JAPONICUS NV                           | BOLLINGER      | 6/24/67  | D. FISH (103)                    | SEMO |    |
| 113    | BROMUS JAPONICUS NV                           | NEW MADRID     | 8/14/71  | K. CLEMENT (177)                 | SEMO |    |
| 113    | BROMUS JAPONICUS NV                           | SCOTT          | 8/20/73  | R. CLINARD (NONE)                | SEMO |    |
| 131    | POA CHAMPNIANA NV                             | CALDWELL       | 5/19/83  | DELOZIER & RAVEILL (963)         | UNMC |    |
| 131    | POA CHAMPNIANA NV                             | RAY            | 5/4/83   | DELOZIER & RAVEILL (925)         | UNMC |    |
| 131    | POA CHAMPNIANA NV                             | LIVINGSTON     | 5/4/83   | RAVEILL (1469)                   | UNMC |    |
| 134    | POA PRATENSIS NV                              | WASHINGTON     | 5/10/69  | FURRY (43)                       | SEMO |    |
| 134    | POA PRATENSIS NV                              | GENTRY         | 5/31/83  | DELOZIER & RAVEILL (1099)        | UNMC |    |
| 134    | POA PRATENSIS NV                              | HOLT           | 5/2/88   | GOODNIGHT (297-68)               | UNMC |    |
| 139    | POA BULBOSA NV                                | CARTER         | 4/18/71  | T. E. BROOKS (NONE)              | SEMO |    |
| 143    | ERAGROSTIS HYPOIDES NV                        | SCOTT          | 9/15/76  | OHMART & THOMPSON (1583)         | SEMO |    |
| 144    | ERAGROSTIS CAPILLARIS NV                      | SCOTT          | 9/15/76  | OHMART & THOMPSON (1605)         | SEMO |    |
| 147    | ERAGROSTIS PECTINACEA NV                      | SCOTT          | 10/6/76  | OHMART & THOMPSON (1659)         | SEMO |    |
| 149    | ERAGROSTIS POAEOIDES NV                       | BUCHANAN       | 9/11/82  | DELOZIER & RABBS (3858)          | UNMC |    |
| 154.99 | ERAGROSTIS SPECTABILIS NV                     | COOPER         | 10/10/83 | DELOZIER, RAVEILL & RABBS (1527) | UNMC |    |
| 154.99 | ERAGROSTIS SPECTABILIS NV                     | RAY            | 9/5/82   | DELOZIER & RABBS (291)           | UNMC |    |
| 156    | DIPLACHNE FASCICULARIS NV                     | CHARITON       | 10/25/75 | W. R. EDDLEMAN (NONE)            | SEMO |    |
| 156    | DIPLACHNE FASCICULARIS NV                     | SCOTT          | 11/3/76  | OHMART (1681)                    | SEMO |    |
| 157    | DIPLACHNE HALEI NV                            | STODDARD       | 10/18/75 | W. R. EDDLEMAN (NONE)            | SEMO |    |
| 162    | UNOLA LATIFOLIA NV                            | NEW MADRID     | 6/30/71  | K. CLEMENT (211)                 | SEMO |    |
| 164    | DACTYLIS GLOMERATA V. GLOMERATA               | WASHINGTON     | 5/10/69  | FURRY (44)                       | SEMO |    |
| 164    | DACTYLIS GLOMERATA NV                         | WORTH          | 6/1/83   | DELOZIER & RAVEILL (1114)        | UNMC |    |
| 164.99 | DACTYLIS GLOMERATA NV                         | NEW MADRID     | 6/2/71   | K. CLEMENT (136)                 | SEMO |    |
| 164.99 | DACTYLIS GLOMERATA NV                         | WAYNE          | 4/25/79  | D. CRITES (70)                   | SEMO |    |
| 164.99 | DACTYLIS GLOMERATA NV                         | SCOTT          | 5/15/68  | DOWNING (57)                     | SEMO |    |
| 166    | PHRAGMITES COMMUNIS V. BERLANDIERI            | SCOTT          | 7/31/72  | T. E. BROOKS (6793)              | SEMO |    |
| 166    | POA PRATENSIS NV                              | SCOTT          | 5/6/70   | L. ROBERTS (NONE)                | SEMO |    |
| 174.99 | AGROPYRON REPENS NV                           | NEWTON         | 6/18/58  | PALMER (67362)                   | UNMC |    |
| 175    | AGROPYRON SMITHII NV                          | CHARITON       | 10/25/75 | W. R. EDDLEMAN (NONE)            | SEMO |    |
| 179    | SECALE CEREALE NV                             | CLAY           | 5/22/83  | RAVEILL (1521)                   | UNMC |    |
| 180    | ELYNUS GLAUCUS NV                             | SHANNON        | 8/10/76  | M. KUSTER (NONE)                 | SEMO |    |
| 184    | ELYNUS RIPARIUS NV                            | STODDARD       | 6/16/69  | B. SCHUCHART (36)                | SEMO |    |
| 185    | ELYNUS VIRGINICUS V. VIRGINICUS-F. VIRGINICUS | NEW MADRID     | 6/14/71  | K. CLEMENT (192)                 | SEMO |    |
| 185.20 | ELYNUS VIRGINICUS V. JEJUNUS                  | SCOTT          | 6/20/74  | T. E. BROOKS (NONE)              | SEMO |    |

|        |                                                   |              |          |                               |      |
|--------|---------------------------------------------------|--------------|----------|-------------------------------|------|
| 185.40 | ELYMUS VIRGINICUS V. GLABRIFLORUS-F. GLABRIFLORUS | BOLLINGER    | 7/1/67   | D. FISH(103)                  | SEMO |
| 185.99 | ELYMUS VIRGINICUS NV                              | RAY          | 8/21/82  | DELOZIER&GIBBS(118)           | UMKC |
| 187    | HYSTRIX PATULA F. PATULA                          | CARTER       | 7/2/72   | T. E. BROOKS(6566)            | SEMO |
| 188    | HORDEUM JUBATUM V. JUBATUM                        | SCOTT        | 6/6/78   | OHMART(2094)                  | SEMO |
| 194    | KOELERIA CRISTATA NV                              | SALINE       | 6/1/68   | HENDERSON(68-204)             | UMKC |
| 202    | AVENA SATIVA NV                                   | CLAY         | 7/2/83   | RAVEILL(1668)                 | UMKC |
| 220    | ALOPECURUS CAROLINIANUS NV                        | CALDWELL     | 5/19/83  | DELOZIER&RAVEILL(956)         | UMKC |
| 220    | ALOPECURUS CAROLINIANUS NV                        | RAY          | 5/19/83  | DELOZIER&RAVEILL(1015)        | UMKC |
| 222    | MUHLBERGIA CUSPIDATA NV                           | CLAY         | 7/15/83  | RAVEILL(1681)                 | UMKC |
| 225.10 | MUHLBERGIA SOBOLIFERA F. SETIGERA                 | NEWMADRID    | 10/28/78 | O. OHMART(2191)               | SEMO |
| 227.99 | MUHLBERGIA BRACHYPHYLLA NV                        | RAY          | 9/25/82  | DELOZIER, GIBBS&FRYE(553)     | UMKC |
| 229.99 | MUHLBERGIA SYLVATICA NV                           | RAY          | 9/5/82   | DELOZIER&GIBBS(273)           | UMKC |
| 229.99 | MUHLBERGIA SYLVATICA NV                           | PLATTE       | 10/14/82 | DELOZIER(721)                 | UMKC |
| 231    | MUHLBERGIA SCHREBERI V. SCHREBERI                 | ST. FRANCOIS | 9/25/76  | K. THOMPSON(175)              | SEMO |
| 238    | SPOROBOLUS HETEROLEPIS NV                         | BOONE        | 9/2/75   | W. R. EDDLEMAN(NONE)          | SEMO |
| 240    | SPOROBOLUS CRYPTANDRUS V. CRYPTANDRUS             | SCOTT        | 11/3/76  | OHMART(1674)                  | SEMO |
| 255    | LEPTOCHLOA FILIFORMIS V. FILIFORMIS               | SCOTT        | 9/15/76  | OHMART&THOMPSON(1566)         | SEMO |
| 255.99 | LEPTOCHLOA FILIFORMIS NV                          | RAY          | 6/28/83  | DELOZIER&RAVEILL(1235)        | UMKC |
| 256    | ELEUSINE INDICA NV                                | CALLAWAY     | 10/10/83 | DELOZIER, RAVEILL&GIBBS(1516) | UMKC |
| 256    | ELEUSINE INDICA NV                                | CHARITON     | 8/8/83   | DELOZIER&RAVEILL(1430)        | UMKC |
| 256    | ELEUSINE INDICA NV                                | LINCOLN      | 10/8/83  | DELOZIER, RAVEILL&ELLIS(1504) | UMKC |
| 260    | SPARTINA PECTINATA NV                             | STODDARD     | 10/18/70 | S. A. SUTTER(327)             | SEMO |
| 271    | PHALARIS ARUNDINACEA NV                           | CHARITON     | 10/26/75 | W. R. EDDLEMAN(NONE)          | SEMO |
| 271    | PHALARIS ARUNDINACEA NV                           | SULLIVAN     | 7/11/84  | DELOZIER(1589)                | UMKC |
| 273    | LEERSIA LENTICULARIS NV                           | BOLLINGER    | 10/19/75 | W. R. EDDLEMAN(NONE)          | SEMO |
| 278.99 | DIGITARIA SANGUINALIS NV                          | CARROLL      | 8/8/83   | DELOZIER&RAVEILL(1361)        | UMKC |
| 278.99 | DIGITARIA SANGUINALIS NV                          | LINCOLN      | 10/9/83  | DELOZIER, RAVEILL&ELLIS(1506) | UMKC |
| 279.99 | DIGITARIA ISCHAEMUM NV                            | LINCOLN      | 10/8/83  | DELOZIER, RAVEILL&ELLIS(1505) | UMKC |
| 280.99 | DIGITARIA FILIFORMIS NV                           | CLAY         | 10/6/83  | RAVEILL(2017)                 | UMKC |
| 288    | PASPALUM FLUITANS NV                              | SCOTT        | 9/15/76  | OHMART&THOMPSON(1581)         | SEMO |
| 289.99 | PASPALUM PUBIFLORUM NV                            | CLAY         | 8/31/83  | RAVEILL(1884)                 | UMKC |
| 289.99 | PASPALUM PUBIFLORUM NV                            | COOPER       | 10/10/83 | DELOZIER, RAVEILL&ELLIS(289)  | UMKC |
| 306.10 | PANICUM DICHOTOMUM V. BARBULATUM                  | NEWMADRID    | 6/9/71   | K. CLEMENT(153)               | SEMO |
| 308.99 | PANICUM LANUGINOSUM NV                            | CALDWELL     | 6/7/69   | HENDERSON(69-118)             | UMKC |
| 321    | PANICUM LATIFOLIUM NV                             | BOLLINGER    | 7/1/67   | D. FISH(109)                  | SEMO |
| 325    | PANICUM DICHOTOMIFLORUM NV                        | NEWMADRID    | 10/28/78 | O. OHMART(2189)               | SEMO |
| 325    | PANICUM DICHOTOMIFLORUM NV                        | ANDREW       | 9/15/82  | DELOZIER(484)                 | UMKC |
| 325    | PANICUM DICHOTOMIFLORUM NV                        | DOUGLAS      | 10/20/82 | DELOZIER(760)                 | UMKC |
| 325    | PANICUM DICHOTOMIFLORUM NV                        | LAFAYETTE    | 9/17/82  | DELOZIER(501)                 | UMKC |
| 325    | PANICUM DICHOTOMIFLORUM NV                        | RAY          | 9/5/82   | DELOZIER&GIBBS(235)           | UMKC |
| 327    | PANICUM GATTINGERI NV                             | CLAY         | 7/15/83  | RAVEILL(1707)                 | UMKC |
| 329    | PANICUM CAPILLARE V. CAPILLARE                    | SCOTT        | 9/15/76  | OHMART&THOMPSON(1567)         | SEMO |
| 330    | PANICUM MILIACEUM NV                              | CLAY         | 8/24/82  | RAVEILL(1838)                 | UMKC |
| 331.99 | PANICUM VIRGATUM NV                               | RAY          | 8/18/82  | DELOZIER&RAVEILL(48)          | UMKC |
| 337    | ECHINOCHLOA COLONUM NV                            | NEWMADRID    | 10/29/78 | O. OHMART(2198)               | SEMO |
| 338.10 | ECHINOCHLOA CRUSGALLI V. CRUSGALLI-F. LONGISETA   | NEWMADRID    | 10/29/78 | O. OHMART(2209)               | SEMO |
| 338.10 | ECHINOCHLOA CRUSGALLI V. CRUSGALLI-F. LONGISETA   | STODDARD     | 8/28/71  | S. A. SUTTER(587)             | SEMO |
| 339    | ECHINOCHLOA MURICATA V. MURICATA                  | SCOTT        | 9/15/76  | OHMART&THOMPSON(1583)         | SEMO |
| 339.20 | ECHINOCHLOA MURICATA V. OCCIDENTALIS              | NEWMADRID    | 6/14/71  | K. CLEMENT(207)               | SEMO |
| 339.30 | ECHINOCHLOA MURICATA V. MICROSTACHYA              | SCOTT        | 9/15/76  | OHMART&THOMPSON(1578)         | SEMO |
| 339.99 | ECHINOCHLOA MURICATA NV                           | CAMDEN       | 9/5/69   | REDFEARN(26582)               | UMKC |
| 340    | SETARIA GLAUCA NV                                 | CHARITON     | 8/8/83   | DELOZIER&RAVEILL(1422)        | UMKC |
| 340    | SETARIA GLAUCA NV                                 | COOPER       | 10/10/83 | DELOZIER, RAVEILL&ELLIS(1529) | UMKC |
| 340    | SETARIA GLAUCA NV                                 | BATES        | 8/28/84  | DELOZIER(1608)                | UMKC |
| 340    | SETARIA GLAUCA NV                                 | DADE         | 8/28/84  | DELOZIER(1623)                | UMKC |



|        |                                                   |             |          |                              |      |
|--------|---------------------------------------------------|-------------|----------|------------------------------|------|
| 341    | SETARIA GENICULATA NV                             | BOONE       | 9/2/75   | W.R.EDDLEMAN(NONE)           | SEMO |
| 343.99 | SETARIA VIRIDIS NV                                | NEWMADRID   | 6/14/71  | K.CLEMENT(185)               | SEMO |
| 343.99 | SETARIA VIRIDIS NV                                | CHARITON    | 8/8/83   | DELOZIER&RAVEILL(1423)       | UMKC |
| 343.99 | SETARIA VIRIDIS NV                                | COOPER      | 10/10/83 | DELOZIER,RAVEILL&ELLIS(1526) | UMKC |
| 343.99 | SETARIA VIRIDIS NV                                | VERNON      | 9/17/83  | DELOZIER&RAVEILL(1503)       | UMKC |
| 344    | SETARIA FABERII NV                                | SCOTT       | 7/16/69  | B.SCHUCHART(111)             | SEMO |
| 344.99 | SETARIA FABERII NV                                | CALLAWAY    | 10/10/83 | DELOZIER,RAVEILL&ELLIS(1517) | UMKC |
| 344.99 | SETARIA FABERII NV                                | MERCER      | 7/11/84  | DELOZIER(1578)               | UMKC |
| 344.99 | SETARIA FABERII NV                                | CEDAR       | 8/28/84  | DELOZIER(1616)               | UMKC |
| 345    | SETARIA ITALICA NV                                | CARROLL     | 8/8/83   | DELOZIER&RAVEILL(1393)       | UMKC |
| 346    | CENCHRUS LONGISPINUS NV                           | CARROLL     | 8/8/83   | DELOZIER&RAVEILL(1372)       | UMKC |
| 362    | TRIPSACUM DACTYLOIDES NV                          | PLATTE      | 7/12/83  | DELOZIER&RAVEILL(1293)       | UMKC |
| 367    | CYPERUS POLYSTACHYOS V.TEXENSIS                   | SCOTT       | 9/23/73  | T.E.BROOKS(7310)             | SEMO |
| 368    | CYPERUS ARISTATUS NV                              | SCOTT       | 9/15/76  | OHMART&THOMPSON(1604)        | SEMO |
| 372    | CYPERUS ERYTHORRHIZOS NV                          | SCOTT       | 9/15/76  | OHMART&THOMPSON(1574)        | SEMO |
| 373    | SPIRAEA VANHOUTTEI NV                             | STODDARD    | 5/9/70   | C.HALL(42)                   | SEMO |
| 374    | CYPERUS ODORATUS V.SPHAERICUS                     | SCOTT       | 7/7/72   | T.E.BROOKS(6621)             | SEMO |
| 375    | CYPERUS FERRUGINESCENS NV                         | SCOTT       | 7/7/72   | T.E.BROOKS(6626)             | SEMO |
| 378.10 | CYPERUS ESCULENTUS V.ESCULENTUS-F.ANGUSTISPICATUS | STODDARD    | 6/25/72  | T.E.BROOKS(6482)             | SEMO |
| 378.10 | CYPERUS ESCULENTUS V.ESCULENTUS-F.ANGUSTISPICATUS | SCOTT       | 7/7/72   | T.E.BROOKS(6635)             | SEMO |
| 378.99 | CYPERUS ESCULENTUS NV                             | CLAY        | 8/24/83  | RAVEILL(1866)                | UMKC |
| 380    | CYPERUS REFRXCTUS NV                              | SCOTT       | 7/2/72   | T.E.BROOKS(6619)             | SEMO |
| 385    | CYPERUS FILICULMIS V.FILICULMIS                   | CARTER      | 7/2/72   | T.E.BROOKS(6563)             | SEMO |
| 385    | CYPERUS FILICULMIS V.FILICULMIS                   | STONE       | 8/4/72   | R.CLINARD(253)               | SEMO |
| 387.10 | CYPERUS OVULARIS V.SPHAERICUS                     | NEWMADRID   | 6/14/71  | K.CLEMENT(201)               | SEMO |
| 388.09 | CYPERUS RETROFRACTUS NV                           | STODDARD    | 10/16/70 | T.E.BROOKS(5970)             | SEMO |
| 391    | ELEOCHARIS QUADRANGULATA V.CRASSIOR               | ST.FRANCOIS | 7/30/67  | COOK(249)                    | SEMO |
| 393.99 | ELEOCHARIS ACICULARIS NV                          | CLAY        | 8/24/83  | RAVEILL(1832)                | UMKC |
| 395    | ELEOCHARIS ENGELMANNI F.DETONSA                   | SCOTT       | 6/1/73   | T.E.BROOKS(7034)             | SEMO |
| 396    | ELEOCHARIS OBTUSA V.OBTUSA                        | SCOTT       | 6/28/69  | B.SCHUCHART(75)              | SEMO |
| 399    | ELEOCHARIS MACROSTACHYA NV                        | SCOTT       | 6/19/75  | T.E.BROOKS(7817)             | SEMO |
| 400    | ELEOCHARIS CALVA NV                               | RIPLEY      | 7/2/76   | OHMART(1190)                 | SEMO |
| 402    | ELEOCHARIS TENUIS V.VERRUCOSA                     | OREGON      | 5/17/69  | ROBERTS(55)                  | SEMO |
| 402    | ELEOCHARIS TENUIS V.VERRUCOSA                     | PERRY       | 5/10/69  | BESAND(66)                   | SEMO |
| 402    | ELEOCHARIS TENUIS V.VERRUCOSA                     | SCOTT       | 6/1/75   | T.E.BROOKS(7785)             | SEMO |
| 402.99 | ELEOCHARIS TENUIS NV                              | CLAY        | 6/11/83  | RAVEILL(1597)                | UMKC |
| 406    | FIMBRISTYLIS VAMLI NV                             | SCOTT       | 9/23/73  | T.E.BROOKS(7313)             | SEMO |
| 407    | FIMBRISTYLIS AUTUMNALIS NV                        | SCOTT       | 9/23/73  | T.E.BROOKS(7308)             | SEMO |
| 421.20 | SCIRPUS ATROVIRENS V.GEORGIANUS                   | STODDARD    | 6/15/69  | J.LUTES(22)                  | SEMO |
| 421.20 | SCIRPUS ATROVIRENS V.GEORGIANUS                   | SCOTT       | 6/6/78   | OHMART(2098)                 | SEMO |
| 429    | HEMICARPHA MICRANTHA NV                           | SCOTT       | 9/23/73  | T.E.BROOKS(7305)             | SEMO |
| 430    | RHYNCHOSPORA MACROSTACHYA NV                      | SCOTT       | 7/7/74   | T.E.BROOKS(7423)             | SEMO |
| 431    | RHYNCHOSPORA CORNICULATA V.CORNICULATA            | SCOTT       | 7/14/78  | OHMART(2148)                 | SEMO |
| 431    | RHYNCHOSPORA CORNICULATA V.INTERIOR               | SCOTT       | 9/23/73  | T.E.BROOKS(7278)             | SEMO |
| 449.10 | CAREX CEPHALOPHORA V.MESOCHOREA                   | SCOTT       | 5/3/73   | T.E.BROOKS(NONE)             | SEMO |
| 456    | CAREX VULPINIDEA NV                               | NEWMADRID   | 6/14/71  | K.CLEMENT(178)               | SEMO |
| 457.10 | CAREX ANNECTENS V.XANTHOCARPA                     | NEWMADRID   | 6/9/71   | K.CLEMENT(122)               | SEMO |
| 466    | CAREX MUSKINGAMENSIS NV                           | STODDARD    | 6/15/69  | J.LUTES(18)                  | SEMO |
| 467    | CAREX SCOPARIA V.SCOPARIA-F.SCOPARIA              | STODDARD    | 6/15/69  | J.LUTES(25)                  | SEMO |
| 471    | CAREX NORMALIS F.NORMALIS                         | STODDARD    | 6/30/69  | B.SCHUCHART(80)              | SEMO |
| 473    | CAREX FESTUCACEA NV                               | STODDARD    | 6/15/69  | J.LUTES(24)                  | SEMO |
| 473    | CAREX FESTUCACEA NV                               | SCOTT       | 6/4/78   | OHMART(2086)                 | SEMO |
| 482    | CAREX JAMESII NV                                  | MILLER      | 4/27/81  | M.SKINNER(512)               | SEMO |
| 483    | CAREX ARTITECTA NV                                | MILLER      | 3/20/82  | M.SKINNER(573)               | SEMO |
| 493    | CAREX MEADII NV                                   | OREGON      | 5/17/69  | ROBERTS(56)                  | SEMO |

508.20 CAREX AMPHIBOLA V.TURGIDA  
 509 CAREX FLACCOSPERMA V.FLACCOSPERMA  
 518 CAREX CAROLINIANA NV  
 522 CAREX SHORTIANA NV  
 545.10 CAREX GRAYII V.HISPIDULA  
 546 CAREX INTUMESCENS V.INTUMESCENS  
 551.20 ARISAEMA ATRORUBENS F.ZEBRINUM  
 551.99 ARISAEMA ATRORUBENS NV  
 572 TRADESCANTIA OHIENSIS NV  
 575 COMMELENA COMMUNIS NV  
 579.40 COMMELENA ERECTA V.DEAMIANA  
 579.40 COMMELENA ERECTA V.DEAMIANA  
 583 HETERANTHERA LIMOSA NV  
 590 JUNCUS TENUIS F.TENUIS  
 591 JUNCUS INTERIOR NV  
 604 JUNCUS NODATUS NV  
 605 JUNCUS DIFFUSISSIMUS NV  
 605 JUNCUS DIFFUSISSIMUS NV  
 618 ALLIUM VINEALE F.VINEALE  
 618 ALLIUM VINEALE F.VINEALE  
 626 HEMEROCALLIS LILEO-ASPHODELUS NV  
 629 ERYTHRONIUM AMERICANUM NV  
 629 ERYTHRONIUM AMERICANUM F.AMERICANUM  
 629.99 ERYTHRONIUM AMERICANUM NV  
 630.99 ERYTHRONIUM ALBIDUM NV  
 634 ORNITHOGALUM UMBELLATUM NV  
 634 ORNITHOGALUM UMBELLATUM NV  
 634 ORNITHOGALUM UMBELLATUM NV  
 634 ORNITHOGALUM UMBELLATUM NV  
 634 ORNITHOGALUM UMBELLATUM NV  
 636 MUSCARI BOTRYOIDES NV  
 639 ASPARAGUS OFFICINALIS NV  
 639 ASPARAGUS OFFICINALIS NV  
 639 ASPARAGUS OFFICINALIS NV  
 642.99 POLYGONATUM BIFLORUM NV  
 642.99 POLYGONATUM BIFLORUM NV  
 645.10 TRILLIUM SESSILE F.VIRIDIFLORUM  
 646 TRILLIUM VIRIDE V.VIRIDE  
 646 TRILLIUM VIRIDE V.VIRIDE  
 660 NARCISSUS PSEUDO-NARCISSUS NV  
 669 IRIS PALLIDA NV  
 677 SISYRINCHIUM ALBIDUM NV  
 677 SISYRINCHIUM ALBIDUM NV  
 678 SISYRINCHIUM CAMPESTRE F.CAMPESTRE  
 679 SISYRINCHIUM BERMUDIANA NV  
 679 SISYRINCHIUM BERMUDIANA NV  
 707 CORALLORHIZA WISTERIANA NV  
 708 CORALLORHIZA ODONTORHIZA NV  
 712 APLECTRUM HYEMALE NV  
 763 QUERCUS BICOLOR NV  
 784 CELTIS OCCIDENTALIS V.OCCIDENTALIS  
 786 CELTIS LAEVIGATA V.LAEVIGATA  
 789 BROUSSONETIA PAPYRIFERA NV  
 792 HUMULUS LUPULUS NV  
 793 HUMULUS JAPONICUS NV

OREGON 5/17/69 J.HUCKABAY(NONE) SEMO  
 NEWMADRID 6/9/71 K.CLEMENT(150) SEMO  
 CLAY 6/24/83 RAVEILL(1634) UMKC  
 SCOTT 5/6/70 L.ROBERTS(NONE) SEMO  
 NEWMADRID 5/17/69 J.HUCKABAY(NONE) SEMO  
 NEWMADRID 5/9/71 K.CLEMENT(103) SEMO  
 SCOTT 5/6/70 S.MATLOCK(4) SEMO  
 DENT 4/19/67 GILL(37) SEMO  
 NEWMADRID 6/9/71 K.CLEMENT(125) SEMO  
 NEWMADRID 6/2/71 K.CLEMENT(129) SEMO  
 JEFFERSON 7/8/77 D.BRADLEY(NONE) SEMO  
 SCOTT 6/29/72 R.CLINARD(58) SEMO  
 STODDARD 7/26/70 S.A.SUTTER(155) SEMO  
 NEWMADRID 6/14/71 K.CLEMENT(181) SEMO  
 STODDARD 6/15/69 J.LUTES(31) SEMO  
 SCOTT 6/10/75 T.E.BROOKS(7830) SEMO  
 NEWMADRID 6/14/71 K.CLEMENT(174) SEMO  
 WAYNE 6/30/72 T.E.BROOKS(6526) SEMO  
 BOLLINGER 6/24/67 D.FISH(5) SEMO  
 SCOTT 6/6/73 R.CLINARD(NONE) SEMO  
 SCOTT 7/11/72 R.CLINARD(131) SEMO  
 BOLLINGER 4/21/62 C.UNDERWOOD(NONE) SEMO  
 CARTER 4/17/71 L.ROBERTS(14) SEMO  
 WAYNE 3/29/77 J.TOUCHETTE(25) SEMO  
 DUNKLIN 4/11/82 K.FIESER(35) SEMO  
 FRANKLIN 5/9/69 B.ROBBINS(135) SEMO  
 MADISON 5/7/68 D.MCFARLAND(37) SEMO  
 SCOTT 5/7/71 J.BURGER(61) SEMO  
 CALDWELL 5/19/83 DELOZIER&RAVEILL(991) UMKC  
 HARRISON 6/1/83 DELOZIER&RAVEILL(1130) UMKC  
 STODDARD 4/15/68 M.BURLESON(16) SEMO  
 STODDARD 5/9/70 C.HALL(44) SEMO  
 SCOTT 7/14/69 SCHUCHART(106) SEMO  
 CHARITON 8/8/83 DELOZIER&RAVEILL(1441) UMKC  
 ST.FRANCOIS 5/18/68 MCFARLAND(60) SEMO  
 WAYNE 5/2/70 D.CRITES(39) SEMO  
 TEXAS 4/9/77 M.SKINNER(37) SEMO  
 MADISON 5/4/52 F.H.BENTLEY(NONE) SEMO  
 WAYNE 5/2/70 D.CRITES(26) SEMO  
 DUNKLIN 4/4/70 S.MATLOCK(1) SEMO  
 STODDARD 5/20/68 M.BURLESON(73) SEMO  
 MADISON 4/30/68 D.MCFARLAND(30) SEMO  
 OREGON 4/17/71 A.MCCRATE(68) SEMO  
 RIPLEY 4/18/69 ROBERTS(15) SEMO  
 SCOTT 7/7/72 T.E.BROOKS(122) SEMO  
 DEKALB 5/31/83 DELOZIER&RAVEILL(1092) UMKC  
 WASHINGTON 10/7/78 M.SKINNER(285) SEMO  
 JACKSON 10/10/83 RAVEILL(2022) UMKC  
 RAY 3/13/83 DELOZIER&RAVEILL(805) UMKC  
 BOLLINGER 10/2/49 ADAMS&WELLS(NONE) SEMO  
 WASHINGTON 5/10/69 FURRY(38) SEMO  
 ST.FRANCOIS 7/15/67 COOK(126) SEMO  
 SCOTT 5/6/70 L.ROBERTS&T.E.BROOKS(NONE) SEMO  
 PLATTE 7/12/83 DELOZIER&RAVEILL(1288) UMKC  
 CHARITON 8/8/83 DELOZIER&RAVEILL(1424) UMKC

793 HUMULUS JAPONICUS NV  
 793 HUMULUS JAPONICUS NV  
 800 PARIETARIA PENNSYLVANICA V. PENNSYLVANICA  
 801 PHORADENDRON FLAVESCENS NV  
 803 ASARUM CANADENSE NV  
 803 ASARUM CANADENSE NV  
 804.99 ARISTOLOCHIA SERPENTARIA NV  
 804.99 ARISTOLOCHIA SERPENTARIA NV  
 811 RUMEX ALTISSIMUS NV  
 811 RUMEX ALTISSIMUS NV  
 814 RUMEX CRISPUS NV  
 819 POLYGONUM PROLIFICUM NV  
 823 POLYGONUM AVICULARE V. AVICULARE  
 823.99 POLYGONUM AVICULARE NV  
 823.99 POLYGONUM AVICULARE NV  
 823.99 POLYGONUM AVICULARE NV  
 823.99 POLYGONUM AVICULARE NV  
 823.99 POLYGONUM AVICULARE NV  
 826 POLYGONUM COCCINEUM V. COCCINEUM-F. COCCINEUM  
 829.10 POLYGONUM PENNSYLVANICUM V. LAEVIGATUM-F. LAEVIGATUM  
 829.10 POLYGONUM PENNSYLVANICUM V. LAEVIGATUM-F. LAEVIGATUM  
 829.20 POLYGONUM PENNSYLVANICUM V. LAEVIGATUM-F. ALBINEUM  
 830 POLYGONUM LAPATHIFOLIUM V. LAPATHIFOLIUM  
 832.10 POLYGONUM CESPITOSUM V. LONGISETUM  
 833 POLYGONUM PERSICARIA V. PERSICARIA  
 833 POLYGONUM PERSICARIA NV  
 834 POLYGONUM PUNCTATUM V. PUNCTATUM  
 835.20 POLYGONUM HYDROPIPEROIDES V. OPELOUSANUM  
 846.99 KOCHIA SCOPARIA NV  
 846.99 KOCHIA SCOPARIA NV  
 849 CHENOPODIUM AMBROSIOIDES V. AMBROSIOIDES  
 849.99 CHENOPODIUM AMBROSIOIDES NV  
 849.99 CHENOPODIUM AMBROSIOIDES NV  
 860 CHENOPODIUM ALBUM V. ALBUM  
 860 CHENOPODIUM ALBUM V. ALBUM  
 860.99 CHENOPODIUM ALBUM NV  
 860.99 CHENOPODIUM ALBUM NV  
 860.99 CHENOPODIUM ALBUM NV  
 865.20 ATRIPLEX PATULA V. HASTATA  
 877 AMARANTHUS TAMARISCINUS NV  
 877 AMARANTHUS TAMARISCINUS NV  
 878 AMARANTHUS PALMERI NV  
 880 AMARANTHUS SPINOSUS NV  
 880 AMARANTHUS SPINOSUS NV  
 882 AMARANTHUS HYBRIDUS NV  
 888 IRESINE RHIZOMATOSA NV  
 890 FROELICHIA GRACILIS NV  
 900 PORTULACA OLERACEA NV  
 905.99 CLAYTONIA VIRGINICA NV  
 914 ARENARIA SERPYLLIFOLIA V. SERPYLLIFOLIA  
 914.99 ARENARIA SERPYLLIFOLIA NV  
 918 STELLARIA MEDIA NV  
 918 STELLARIA MEDIA NV  
 918.90 STELLARIA MEDIA NV

CLAY 8/31/83 RAVEILL(1923) UMKC  
 HOWARD 8/8/83 DELOZIER&RAVEILL(1460) UMKC  
 SCOTT 7/7/72 CLINARD&BROOKS(119) SEMO  
 BOLLINGER 7/2/67 COOK(50) SEMO  
 IRON 5/2/81 E. EMERY(75) SEMO  
 JEFFERSON 4/21/78 S. FERRELL(52) SEMO  
 CLAY 8/24/83 RAVEILL(1817) UMKC  
 RAY 5/31/83 DELOZIER&RAVEILL(1031) UMKC  
 PEMISCOT 7/15/72 R. CLINARD(149) SEMO  
 CARROLL 8/8/83 DELOZIER&RAVEILL(1381) UMKC  
 NEWMADRID 7/17/72 R. CLINARD(161) SEMO  
 SCOTT 7/14/78 OHMART(2145) SEMO  
 NEWMADRID 10/28/78 O. OHMART(2197) SEMO  
 ATCHISON 6/27/84 DELOZIER&ELLIS(1573) UMKC  
 BATES 8/28/84 DELOZIER(1607) UMKC  
 CALDWELL 7/11/24 DELOZIER(1603) UMKC  
 CHARITON 8/8/83 DELOZIER&RAVEILL(1414) UMKC  
 MONTGOMERY 10/10/83 DELOZIER, RAVEILL&ELLIS(1508) UMKC  
 VERNON 8/28/84 DELOZIER(1614) UMKC  
 JEFFERSON 8/21/77 M. SKINNER(NONE) SEMO  
 PEMISCOT 7/17/72 R. CLINARD(175) SEMO  
 SCOTT 7/7/72 CLINARD&BROOKS(111) SEMO  
 STODDARD 8/31/71 S. A. SUTTER(613) SEMO  
 SCOTT 9/15/76 OHMART&THOMPSON(1572) SEMO  
 JACKSON 8/27/82 DELOZIER(165) UMKC  
 SCOTT 7/7/72 CLINARD&BROOKS(110) SEMO  
 JOHNSON 8/22/82 DELOZIER&GIBBS(161) UMKC  
 SCOTT 9/15/76 OHMART&THOMPSON(1559) SEMO  
 NEWMADRID 7/1/72 R. CLINARD(161) SEMO  
 CARROLL 8/8/83 DELOZIER&RAVEILL(1371) UMKC  
 CHARITON 8/8/83 DELOZIER&RAVEILL(1426) UMKC  
 SCOTT 9/15/76 OHMART&THOMPSON(1577) SEMO  
 DOUGLAS 9/2/68 HENDERSON(68-878) UMKC  
 ST. CLAIR 10/14/67 HENDERSON(67-1953) UMKC  
 BOLLINGER 5/16/62 C. UNDERWOOD(3) SEMO  
 SCOTT 9/15/76 OHMART&THOMPSON(1560) SEMO  
 ATCHISON 6/27/84 DELOZIER&ELLIS(1563) UMKC  
 GRUNDY 7/11/84 DELOZIER(1600) UMKC  
 PETTIS 10/3/82 DELOZIER(678) UMKC  
 SCOTT 6/6/78 OHMART(2095) SEMO  
 NEWMADRID 10/29/78 O. OHMART(2200) SEMO  
 SCOTT 9/15/76 OHMART&THOMPSON(1573) SEMO  
 CLAY 10/6/83 RAVEILL(1983) UMKC  
 NEWMADRID 7/3/71 K. CLEMENT(167) SEMO  
 SCOTT 7/20/67 JONES(NONE) SEMO  
 SCOTT 9/15/76 OHMART&THOMPSON(1570) SEMO  
 CARTER 10/11/67 REDFEARN&PYRAH(22422) UMKC  
 SCOTT 6/17/69 SCHUCHART(NONE) SEMO  
 SCOTT 10/6/76 OHMART&THOMPSON(1652) SEMO  
 RIPLEY 4/20/62 D. KENNEDY(NONE) SEMO  
 SCOTT 5/6/70 B. HIPPER(65) SEMO  
 CLAY 5/16/83 RAVEILL(1482) UMKC  
 DEKALB 5/31/83 DELOZIER&RAVEILL(1082) UMKC  
 LIVINGSTON 5/4/83 RAVEILL(1472) UMKC  
 SCOTT 4/11/73 T. E. BROOKS(NONE) SEMO

|         |                                               |              |         |                        |      |
|---------|-----------------------------------------------|--------------|---------|------------------------|------|
| 922.99  | CERASTIUM VULGATUM NV                         | CLINTON      | 5/19/83 | DELOZIER&RAVEILL(940)  | UMKC |
| 922.99  | CERASTIUM VULGATUM NV                         | RAY          | 6/7/83  | RAVEILL(1147)          | UMKC |
| 922.99  | CERASTIUM VULGATUM NV                         | CASS         | 5/4/84  | DELOZIER&ELLIS(1535)   | UMKC |
| 924     | CERASTIUM NUTANS NV                           | SCOTT        | 4/25/84 | A. KROMA(44)           | SEMO |
| 924     | CERASTIUM NUTANS NV                           | CALDWELL     | 5/19/83 | DELOZIER&RAVEILL(966)  | UMKC |
| 926     | CERASTIUM VISCOSUM NV                         | SCOTT        | 4/11/73 | T. E. BROOKS(NONE)     | SEMO |
| 926.99  | CERASTIUM VISCOSUM NV                         | WRIGHT       | 4/20/83 | DELOZIER&GIBBS(844)    | UMKC |
| 931     | AGROSTEMMA GITHAGO NV                         | MADISON      | 5/18/68 | D. MCFARLAND(54)       | SEMO |
| 938     | SILENE CUCUBALUS NV                           | CLAY         | 7/2/83  | RAVEILL(1659)          | UMKC |
| 945     | SAPONARIA OFFICINALIS NV                      | NEWMADRID    | 7/11/72 | R. CLINARD(136)        | SEMO |
| 945     | SAPONARIA OFFICINALIS NV                      | RIPLEY       | 7/2/76  | OHMART(1176)           | SEMO |
| 945     | SAPONARIA OFFICINALIS NV                      | SCOTT        | 7/7/69  | J. LUTES(NONE)         | SEMO |
| 945     | SAPONARIA OFFICINALIS NV                      | CHARITON     | 8/8/83  | DELOZIER&RAVEILL(1415) | UMKC |
| 945     | SAPONARIA OFFICINALIS NV                      | CASS         | 9/7/82  | DELOZIER&GIBBS(344)    | UMKC |
| 950     | DIANTHUS PROLIFER NV                          | SHANNON      | 7/4/69  | T. E. BROOKS(NONE)     | SEMO |
| 953     | NUPHAR LUTEUM SP. MACROPHYLLUM                | RIPLEY       | 5/14/76 | OHMART(958)            | SEMO |
| 958     | BRASENIA SCHREBERI NV                         | STODDARD     | 6/13/69 | LUTES(14)              | SEMO |
| 971     | DELPHINIUM AJACIS NV                          | STODDARD     | 6/21/69 | B. SCHUCHART(58)       | SEMO |
| 972     | DELPHINIUM TRICORNE F. TRICORNE               | CARTER       | 5/7/72  | BLIGGENSTORFER(46)     | SEMO |
| 972     | DELPHINIUM TRICORNE F. TRICORNE               | MADISON      | 4/27/68 | B. TINNIN(37)          | SEMO |
| 977     | ISOPYRUM BITERNATUM NV                        | MADISON      | 4/29/75 | K. THOMPSON(NONE)      | SEMO |
| 977     | ISOPYRUM BITERNATUM NV                        | WAYNE        | 3/14/77 | J. TOUCHETTE(52)       | SEMO |
| 983     | RANUNCULUS MICRANTHUS V. MICRANTHUS           | REYNOLDS     | 4/8/78  | C. BERKBIGLER(19)      | SEMO |
| 983     | RANUNCULUS MICRANTHUS V. MICRANTHUS           | SCOTT        | 5/4/80  | M. PIGG(186)           | SEMO |
| 983.10  | RANUNCULUS MICRANTHUS V. DELITESCENS          | WAYNE        | 4/25/70 | D. CRITES(19)          | SEMO |
| 983.10  | RANUNCULUS MICRANTHUS V. DELITESCENS          | SCOTT        | 4/25/84 | J. BROWN(90)           | SEMO |
| 984     | RANUNCULUS HARVEYI F. HARVEYI                 | OREGON       | 4/17/71 | K. CLEMENT(29)         | SEMO |
| 991     | RANUNCULUS SEPTENTRIONALIS V. SEPTENTRIONALIS | NEWMADRID    | 4/9/71  | K. CLEMENT(NONE)       | SEMO |
| 991     | RANUNCULUS SEPTENTRIONALIS V. SEPTENTRIONALIS | ST. FRANCOIS | 4/26/80 | M. PIGG(93)            | SEMO |
| 991.99  | RANUNCULUS SEPTENTRIONALIS NV                 | OREGON       | 4/17/71 | J. BURGER(25)          | SEMO |
| 991.99  | RANUNCULUS SEPTENTRIONALIS NV                 | RAY          | 5/4/83  | DELOZIER&RAVEILL(923)  | UMKC |
| 992     | RANUNCULUS HISPIDUS V. HISPIDUS               | MADISON      | 4/29/78 | S. SAGO(45)            | SEMO |
| 992     | RANUNCULUS HISPIDUS V. HISPIDUS               | STODDARD     | 4/19/69 | OVERALL(46)            | SEMO |
| 993.10  | RANUNCULUS FASCICULARIS V. APRICUS            | STODDARD     | 4/6/63  | E. LACY(NONE)          | SEMO |
| 994     | RANUNCULUS PARVIFLORUS NV                     | OREGON       | 4/17/71 | K. CLEMENT(46)         | SEMO |
| 995.10  | RANUNCULUS SARDOUS NV                         | STODDARD     | 5/15/71 | J. HILL(95)            | SEMO |
| 997     | MYOSURUS MINIMUS NV                           | CALDWELL     | 5/19/83 | DELOZIER&RAVEILL(964)  | UMKC |
| 997     | MYOSURUS MINIMUS NV                           | HENRY        | 5/4/84  | DELOZIER&ELLIS(1544)   | UMKC |
| 997     | MYOSURUS MINIMUS NV                           | JOHNSON      | 5/4/84  | DELOZIER&ELLIS(1538)   | UMKC |
| 1002.10 | HEPATIC A NOBILIS V. ACUTA-F. ACUTA           | SCOTT        | 4/25/84 | J. BROWN(70)           | SEMO |
| 1003    | ANEMONELLA THALICTROIDES F. THALICTROIDES     | MADISON      | 4/6/68  | B. TINNIN(45)          | SEMO |
| 1003    | ANEMONELLA THALICTROIDES F. THALICTROIDES     | RIPLEY       | 4/17/77 | R. LASSEN(76)          | SEMO |
| 1009    | CLEMATIS CRISPA NV                            | BOLLINGER    | 4/30/72 | G. BOHNERT(59)         | SEMO |
| 1023    | STYLOPHORUM DIPHYLLUM NV                      | FRANKLIN     | 4/26/59 | D. G. RHODES(NONE)     | SEMO |
| 1031    | DICENTRA CANADENSIS NV                        | FRANKLIN     | 4/26/59 | D. G. RHODES(NONE)     | SEMO |
| 1035    | CORYDALIS HALEI NV                            | NEWMADRID    | 4/21/84 | K. BANKS(45)           | SEMO |
| 1038    | BRASSICA HIRTA NV                             | NEWMADRID    | 5/23/70 | S. MATLOCK(10)         | SEMO |
| 1042    | BRASSICA RAPA NV                              | NEWMADRID    | 4/14/68 | DOWNING(20)            | SEMO |
| 1043    | BRASSICA NAPUS V. NAPOBRASSICA                | SCOTT        | 5/9/71  | J. BURGER(62)          | SEMO |
| 1049    | LEPIDIUM CAMPESTRE NV                         | STODDARD     | 5/2/76  | T. WILLS(NONE)         | SEMO |
| 1049    | LEPIDIUM CAMPESTRE NV                         | WORTH        | 6/1/83  | DELOZIER&RAVEILL(1115) | UMKC |
| 1051    | LEPIDIUM VIRGINICUM V. VIRGINICUM             | NEWMADRID    | 4/24/77 | R. K. NEWMAN(59)       | SEMO |
| 1051    | LEPIDIUM VIRGINICUM NV                        | CHARITON     | 8/8/83  | DELOZIER&RAVEILL(1434) | UMKC |
| 1051    | LEPIDIUM VIRGINICUM NV                        | CLINTON      | 5/19/83 | DELOZIER&RAVEILL(935)  | UMKC |
| 1051    | LEPIDIUM VIRGINICUM NV                        | GENTRY       | 5/31/83 | DELOZIER&RAVEILL(1096) | UMKC |



|          |                                                |             |          |                               |      |
|----------|------------------------------------------------|-------------|----------|-------------------------------|------|
| 1239     | AGRIMONIA PARVIFLORA NV                        | CEDAR       | 8/26/72  | S.A. SUTTER(844)              | SEMO |
| 1242     | ROSA MULTIFLORA NV                             | RAY         | 6/7/83   | DELOZIER(1143)                | UMKC |
| 1251     | ROSA CAROLINA V.CAROLINA                       | NEWMADRID   | 6/9/71   | K. CLEMENT(122)               | SEMO |
| 1260     | PRUNUS HORTULANA NV                            | RIPLEY      | 4/20/62  | D. KENNEDY(NONE)              | SEMO |
| 1260     | PRUNUS HORTULANA NV                            | RAY         | 4/27/83  | DELOZIER(883)                 | UMKC |
| 1261     | PRUNUS MUNSONIANA NV                           | RAY         | 4/27/83  | DELOZIER(889)                 | UMKC |
| 1262     | PRUNUS ANGUSTIFOLIA V.ANGUSTIFOLIA             | ST.FRANCOIS | 4/8/78   | SAGO(6)                       | SEMO |
| 1263     | PRUNUS PERSICA NV                              | RAY         | 4/27/83  | DELOZIER(902)                 | UMKC |
| 1266     | PRUNUS SEROTINA NV                             | DENT        | 4/21/67  | GILL(36)                      | SEMO |
| 1273. 10 | GLEDTISIA TRIACANTHOS V.INERMIS                | BOLLINGER   | 4/1/63   | ED. LACY(NONE)                | SEMO |
| 1279     | CASSIA FASCICULATA V.FASCICULATA-F.FASCICULATA | JEFFERSON   | 6/19/77  | M. TOWLER(NONE)               | SEMO |
| 1280     | CASSIA NICTITANS V.NICTITANS                   | CEDAR       | 8/26/72  | S.A. SUTTER(842)              | SEMO |
| 1283. 99 | BAPTISIA LEUCOPHAEA NV                         | RAY         | 5/19/83  | DELOZIER&RAVEILL(1019)        | UMKC |
| 1284     | BAPTISIA LEUCANTHA NV                          | BUCHANAN    | 6/12/83  | DELOZIER&RAVEILL(1305)        | UMKC |
| 1284     | BAPTISIA LEUCANTHA NV                          | PLATTE      | 7/11/83  | DELOZIER&RAVEILL(1280)        | UMKC |
| 1289     | TRIFOLIUM PRATENSE V.PRATENSE-F.PRATENSE       | PEMISCOT    | 7/15/72  | R. CLINARD(150)               | SEMO |
| 1289. 99 | TRIFOLIUM PRATENSE NV                          | GENTRY      | 5/31/83  | DELOZIER&RAVEILL(1101)        | UMKC |
| 1289. 99 | TRIFOLIUM PRATENSE NV                          | WORTH       | 6/1/83   | DELOZIER&RAVEILL(1113)        | UMKC |
| 1293     | TRIFOLIUM REPENS F.REPENS                      | MADISON     | 5/14/68  | B. TINNIN(35)                 | SEMO |
| 1293     | TRIFOLIUM REPENS NV                            | DEKALB      | 5/31/83  | DELOZIER&RAVEILL(1093)        | UMKC |
| 1293. 99 | TRIFOLIUM REPENS NV                            | ST.FRANCOIS | 7/15/67  | COOK(152)                     | SEMO |
| 1299     | TRIFOLIUM CAMPESTRE NV                         | ST.FRANCOIS | 5/19/68  | MCFARLAND(60)                 | SEMO |
| 1299     | TRIFOLIUM CAMPESTRE NV                         | RAY         | 6/28/83  | DELOZIER&RAVEILL(1222)        | UMKC |
| 1300     | TRIFOLIUM DUBIUM NV                            | NEWMADRID   | 5/3/63   | D.W. HODGES(117)              | SEMO |
| 1300     | TRIFOLIUM DUBIUM NV                            | STODDARD    | 5/1/71   | K. CLEMENT(88)                | SEMO |
| 1301     | MEDICAGO SATIVA NV                             | JEFFERSON   | 7/10/77  | T. JURKOVICH(NONE)            | SEMO |
| 1301     | MEDICAGO SATIVA NV                             | SCOTT       | 7/7/69   | DUFUR(88)                     | SEMO |
| 1301     | MEDICAGO SATIVA NV                             | PUTNAM      | 7/11/84  | DELOZIER(1580)                | UMKC |
| 1302     | MEDICAGO LUPULINA V.LUPULINA                   | OREGON      | 4/17/71  | K. CLEMENT(51)                | SEMO |
| 1302. 10 | MEDICAGO LUPULINA V.GLANDULOSA                 | NEWMADRID   | 7/1/72   | R. CLINARD(72)                | SEMO |
| 1302. 99 | MEDICAGO LUPULINA NV                           | HARRISON    | 6/1/83   | DELOZIER&RAVEILL(1132)        | UMKC |
| 1302. 99 | MEDICAGO LUPULINA NV                           | RAY         | 10/1/82  | DELOZIER(624)                 | UMKC |
| 1305     | MELILOTUS OFFICINALIS NV                       | NEWMADRID   | 6/14/71  | K. CLEMENT(173)               | SEMO |
| 1306     | MELILOTUS ALBUS NV                             | CHRISTIAN   | 8/5/72   | R. CLINARD(261)               | SEMO |
| 1308     | LOTUS CORNICULATUS NV                          | DAVIESS     | 6/1/83   | DELOZIER&RAVEILL(1136A)       | UMKC |
| 1308     | LOTUS CORNICULATUS NV                          | GRUNDY      | 7/11/84  | DELOZIER(1601)                | UMKC |
| 1308     | LOTUS CORNICULATUS NV                          | LIVINGSTON  | 7/11/84  | DELOZIER(1602)                | UMKC |
| 1308     | LOTUS CORNICULATUS NV                          | MERCER      | 7/11/84  | DELOZIER(1576)                | UMKC |
| 1308     | LOTUS CORNICULATUS NV                          | PETTIS      | 6/7/84   | DELOZIER(1561A)               | UMKC |
| 1308     | LOTUS CORNICULATUS NV                          | PLATTE      | 7/12/83  | DELOZIER&RAVEILL(1314)        | UMKC |
| 1308     | LOTUS CORNICULATUS NV                          | PUTNAM      | 7/11/84  | DELOZIER(1581)                | UMKC |
| 1308     | LOTUS CORNICULATUS NV                          | LINN        | 5/18/84  | DELOZIER&ZELK(1548A)          | UMKC |
| 1320     | AMORPHA CANESCENS F.CANESCENS                  | STODDARD    | 7/14/69  | J. LUTES(97)                  | SEMO |
| 1323. 10 | TEPHROSIA VIRGINIANA V.HOLOSERICEA             | ST.FRANCOIS | 7/1/67   | COOK(70)                      | SEMO |
| 1326     | ROBINIA PSEUDO-ACACIA NV                       | WAYNE       | 4/25/70  | D. CRITES(74)                 | SEMO |
| 1326     | ROBINIA PSEUDO-ACACIA NV                       | STODDARD    | 5/9/70   | C. HALL(45)                   | SEMO |
| 1326     | ROBINIA PSEUDO-ACACIA NV                       | SCOTT       | 5/10/71  | J. BURGER(59)                 | SEMO |
| 1327     | ROBINIA HISPIDA V.HISPIDA                      | JEFFERSON   | 4/11/81  | D. CONSTANTZ(24)              | SEMO |
| 1347     | DESMODIUM CANADENSE NV                         | OREGON      | 9/3/73   | J. WANDEL(NONE)               | SEMO |
| 1355     | LESPEDEZA PROCUMBENS V.PROCUMBENS              | NEWMADRID   | 7/17/72  | R. CLINARD(157)               | SEMO |
| 1366     | LESPEDEZA CUNEATA NV                           | PERRY       | 4/5/76   | D. CATTOUR(58)                | SEMO |
| 1368     | LESPEDEZA STIPULACEA NV                        | CALLOWAY    | 10/10/83 | DELOZIER, RAVEILL&ELLIS(1518) | UMKC |
| 1368     | LESPEDEZA STIPULACEA NV                        | CHARITON    | 8/8/83   | DELOZIER&RAVEILL(1429)        | UMKC |
| 1371     | VICIA SATIVA V.NIGRA                           | NEWMADRID   | 4/21/84  | K. BANKS(43)                  | SEMO |
| 1378     | VICIA VILLOSA F.VILLOSA                        | NEWMADRID   | 5/8/71   | K. CLEMENT(96)                | SEMO |

1378 VICIA VILLOSA F.VILLOSA  
 1379 VICIA DASYCARPA NV  
 1384 LATHYRUS HIRSUTUS NV  
 1384 LATHYRUS HIRSUTUS NV  
 1385 LATHYRUS LATIFOLIUS NV  
 1385 LATHYRUS LATIFOLIUS NV  
 1385 LATHYRUS LATIFOLIUS NV  
 1385 LATHYRUS LATIFOLIUS NV  
 1406 LINUM MEDIUM V.TEXANUM  
 1409 OXALIS CORNICULATA NV  
 1409 OXALIS CORNICULATA NV  
 1409 OXALIS CORNICULATA NV  
 1409 OXALIS CORNICULATA NV  
 1409 OXALIS CORNICULATA NV  
 1410 OXALIS DILLENII SP.DILLENII  
 1410.99 OXALIS DILLENII NV  
 1410.99 OXALIS DILLENII NV  
 1410.99 OXALIS DILLENII NV  
 1411 OXALIS STRICTA NV  
 1411 OXALIS STRICTA NV  
 1411 OXALIS STRICTA NV  
 1413 GERANIUM CAROLINIANUM V.CAROLINIANUM  
 1413.99 GERANIUM CAROLINIANUM NV  
 1413.99 GERANIUM CAROLINIANUM NV  
 1415 GERANIUM PUSILLUM NV  
 1418 TRIBULUS TERRESTRIS NV  
 1424.10 POLYGALA SENEGA V.LATIFOLIA  
 1431 CROTON GLANDULOSUS V.SEPTENTRIONALIS  
 1431 CROTON GLANDULOSUS V.SEPTENTRIONALIS  
 1431 CROTON GLANDULOSUS V.SEPTENTRIONALIS  
 1433 CROTON MONANTHOGYNUS NV  
 1437 ACALYPHA OSTRYAEPOLIA NV  
 1440 ACALYPHA GRACILENS V.GRACILENS  
 1444.99 EUPHORBIA DENTATA NV  
 1445 EUPHORBIA HETEROPHYLLA V.HETEROPHYLLA  
 1447 EUPHORBIA OBTUSATA NV  
 1449 EUPHORBIA CYPARISSIAS NV  
 1452 EUPHORBIA MARGINATA NV  
 1453.20 EUPHORBIA COROLLATA V.PANICULATA  
 1456 EUPHORBIA SERPENS NV  
 1458 EUPHORBIA SUPINA NV  
 1458 EUPHORBIA SUPINA NV  
 1459 EUPHORBIA HUMISTRATA NV  
 1482.20 ACER SACCHARUM V.SACCHARUM-F.SCHNECKII  
 1483.99 ACER NIGRUM NV  
 1492 IMPATIENS CAPENSIS NV  
 1515 ALTHAEA ROSEA NV  
 1526 SPHAERALCEA ANGSTA NV  
 1529 ANODA CRISTATA V.CRISTATA  
 1530 ABUTILON THEOPHRASTI NV  
 1531 HIBISCUS SYRIACUS NV  
 1533 HIBISCUS MILITARIS NV  
 1534 HIBISCUS TRIONUM NV  
 1537 HYPERICUM PERFORATUM NV  
 1537 HYPERICUM PERFORATUM NV

PEMISCOT 7/17/72 R.CLINARD(172) SEMO  
 BOLLINGER 4/29/76 B.HANNER(46) SEMO  
 NEWMADRID 6/24/72 R.CLINARD(38) SEMO  
 SCOTT 6/6/73 R.CLINARD(NONE) SEMO  
 NEWMADRID 5/23/70 S.MATLOCK(18) SEMO  
 WEBSTER 8/5/72 R.CLINARD(269) SEMO  
 SCOTT 7/25/72 R.CLINARD(229) SEMO  
 RAY 6/28/83 DELOZIER&RAVEILL(1230) UMKC  
 CARTER 7/9/77 N.STEWARD(NONE) SEMO  
 DENT 5/10/68 PRATT(43) SEMO  
 PERRY 5/3/69 BESAND(42) SEMO  
 WAYNE 4/26/71 B.TURNER(64) SEMO  
 STODDARD 5/2/70 C.HALL(15) SEMO  
 SCOTT 5/6/71 C.MCCULLOUGH(15) SEMO  
 PEMISCOT 7/17/72 R.CLINARD(167) SEMO  
 ST.FRANCOIS 7/9/67 COOK(113) SEMO  
 CALDWELL 5/19/83 DELOZIER&RAVEILL(961) UMKC  
 PETTIS 6/7/84 DELOZIER(1556) UMKC  
 ATCHISON 6/27/84 DELOZIER&ELLIS(1562) UMKC  
 CALLAWAY 10/10/83 DELOZIER,RAVEILL&ELLIS(1519) UMKC  
 CHARITON 8/8/83 DELOZIER&RAVEILL(1442) UMKC  
 NEWMADRID 5/8/71 K.CLEMENT(177) SEMO  
 CALDWELL 5/31/83 DELOZIER&RAVEILL(1077) UMKC  
 PETTIS 6/7/84 DELOZIER(1555) UMKC  
 CLAY 7/2/83 RAVEILL(1651) UMKC  
 CARROLL 8/8/83 DELOZIER&RAVEILL(1369) UMKC  
 WAYNE 6/28/72 S.A.SUTTER(741) SEMO  
 CEDAR 8/26/72 S.A.SUTTER(841) SEMO  
 NEWMADRID 7/12/72 R.CLINARD(144) SEMO  
 STONE 8/3/72 R.CLINARD(254) SEMO  
 STODDARD 10/18/70 SUTTER&BROOKS(290) SEMO  
 CHARITON 8/8/83 DELOZIER&RAVEILL(1444) UMKC  
 STODDARD 8/31/71 S.A.SUTTER(616) SEMO  
 CARROLL 8/8/83 DELOZIER&RAVEILL(1367) UMKC  
 NEWMADRID 7/25/76 C.THOMAS(1) SEMO  
 RIPLEY 5/14/76 OHMART(971) SEMO  
 RAY 5/19/83 DELOZIER&RAVEILL(1022) UMKC  
 PERRY 7/28/67 BUCHHEIT(100) SEMO  
 CEDAR 8/26/72 S.A.SUTTER(845) SEMO  
 SCOTT 9/15/76 OHMART&THOMPSON(1587) SEMO  
 CARROLL 8/8/83 DELOZIER&RAVEILL(1360) UMKC  
 DADE 8/28/84 DELOZIER(1625) UMKC  
 CASS 10/8/73 NORTON(299/73) UMKC  
 JEFFERSON 4/17/65 M.BAUMANN(1) SEMO  
 STODDARD 5/1/63 E.LACY(NONE) SEMO  
 NEWMADRID 6/30/71 K.CLEMENT(157) SEMO  
 NEWMADRID 7/17/72 R.CLINARD(158) SEMO  
 LAWRENCE 9/29/50 PALMER(51208) UMKC  
 STODDARD 9/15/83 J.LAWRENCE(NONE) SEMO  
 CHARITON 8/8/83 DELOZIER&RAVEILL(1427) UMKC  
 SCOTT 8/6/77 OHMART(1983) SEMO  
 STE.GENEVIEVE 7/16/77 M.TOWLER(NONE) SEMO  
 CALLAWAY 10/10/83 DELOZIER,RAVEILL&ELLIS(1514) UMKC  
 BOLLINGER 6/24/75 W.TEETERS(42) SEMO  
 REYNOLDS 7/2/77 T.JURKOVICH(NONE) SEMO







|         |                                                    |            |          |                                      |      |
|---------|----------------------------------------------------|------------|----------|--------------------------------------|------|
| 1867.10 | GLECHOMA HEDERACEA V. MICHANITHA                   | RLYNOLDS   | 4/8/78   | M. LATURNO (28)                      | SEMO |
| 1870    | PHYSOSTEGIA VIRGINIANA V. VIRGINIANA F. VIRGINIANA | DALLAS     | 8/26/72  | S. A. SUTTER (829)                   | SEMO |
| 1870.99 | PHYSOSTEGIA VIRGINIANA NV                          | BOLLINGER  | 9/4/77   | R. BORCHERT (NONE)                   | SEMO |
| 1873    | PHYSOSTEGIA INTERMEDIA NV                          | NEWMADRID  | 5/30/53  | D. G. RHODES (NONE)                  | SEMO |
| 1877    | LAMIAM AMPLEXICAULE NV                             | LIVINGSTON | 5/4/83   | RAVEILL (1468)                       | UMKC |
| 1878    | LAMIAM PURPUREUM NV                                | DUNKLIN    | 4/11/82  | K. FIESER (38)                       | SEMO |
| 1878    | LAMIAM PURPUREUM NV                                | CALDWELL   | 5/19/83  | DELOZIER & RAVEILL (981)             | UMKC |
| 1878    | LAMIAM PURPUREUM NV                                | RAY        | 3/31/83  | DELOZIER & RAVEILL (825)             | UMKC |
| 1878    | LAMIAM PURPUREUM NV                                | WRIGHT     | 4/20/83  | DELOZIER & GIBBS (845)               | UMKC |
| 1882    | SALVIA LYRATA NV                                   | NEWMADRID  | 5/9/71   | K. CLEMENT (107)                     | SEMO |
| 1888.10 | MONARDA FISTULOSA V. MOLLIS                        | SCOTT      | 7/58     | R. REED (151)                        | SEMO |
| 1888.19 | MONARDA FISTULOSA V. FISTULOSA                     | BOLLINGER  | 7/2/67   | COOK (59)                            | SEMO |
| 1894    | BLEPHILIA HIRSUTA NV                               | PETTIS     | 6/14/83  | DELOZIER (1173)                      | UMKC |
| 1900    | PHYCNANTHEMUM TENUIFOLIUM NV                       | PERRY      | 7/24/67  | BUCHHEIT (83)                        | SEMO |
| 1900    | PHYCNANTHEMUM TENUIFOLIUM NV                       | BUCHANAN   | 7/12/83  | DELOZIER & RAVEILL (1304)            | UMKC |
| 1900    | PHYCNANTHEMUM TENUIFOLIUM NV                       | PLATTE     | 7/11/83  | DELOZIER & RAVEILL (1279)            | UMKC |
| 1905    | PHYCNANTHEMUM ALBESCENS NV                         | NEWMADRID  | 6/22/71  | K. CLEMENT (154)                     | SEMO |
| 1908    | LYCOPUS AMERICANUS NV                              | BARRY      | 9/14/79  | HORNBERGER (852)                     | UMKC |
| 1921    | SOLANUM AMERICANUM NV                              | CHARITON   | 8/8/83   | DELOZIER & RAVEILL (1437)            | UMKC |
| 1923    | SOLANUM SARACHOIDES NV                             | CALLOWAY   | 10/10/83 | DELOZIER, RAVEILL & ELLIS (1515)     | UMKC |
| 1923    | SOLANUM SARACHOIDES NV                             | CLAY       | 8/10/83  | RAVEILL (1762)                       | UMKC |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | CHRISTIAN  | 8/5/72   | R. CLINARD (259)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | GREENE     | 8/5/72   | R. CLINARD (265)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | HOWELL     | 8/5/72   | R. CLINARD (267)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | NEWMADRID  | 5/24/72  | R. CLINARD (92)                      | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | PEMISCOT   | 7/15/72  | R. CLINARD (152)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | TANEY      | 8/5/72   | R. CLINARD (264)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | STONE      | 8/3/72   | R. CLINARD (252)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | WEBSTER    | 8/5/72   | R. CLINARD (272)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | STODDARD   | 7/19/72  | R. CLINARD (186)                     | SEMO |
| 1924.10 | SOLANUM CAROLINENSE F. ALBIFLORUM                  | SCOTT      | 7/7/72   | CLINARD & BROOKS (117)               | SEMO |
| 1927    | SOLANUM ROSTRATUM NV                               | SCOTT      | 8/5/67   | M. JONES (90)                        | SEMO |
| 1927    | SOLANUM ROSTRATUM NV                               | CHARITON   | 8/8/83   | DELOZIER & RAVEILL (1439)            | UMKC |
| 1933.99 | PHYSALIS LONGIFOLIA NV                             | CARROLL    | 8/8/83   | DELOZIER & RAVEILL (1387)            | UMKC |
| 1935.10 | PHYSALIS ANGULATA V. PENDULA                       | STODDARD   | 8/31/71  | S. A. SUTTER (600)                   | SEMO |
| 1935.10 | PHYSALIS ANGULATA V. PENDULA                       | SCOTT      | 10/6/76  | OHMART & THOMPSON (1653)             | SEMO |
| 1937    | PHYSALIS MISSOURIENSIS NV                          | RAY        | 8/28/82  | DELOZIER, CRAIN, FRYE & GIBBS (170A) | UMKC |
| 1941.10 | DATURA STRAMONIUM V. TATULA                        | NEWMADRID  | 5/25/68  | DOWNING (68)                         | SEMO |
| 1941.10 | DATURA STRAMONIUM V. TATULA                        | SCOTT      | 7/7/72   | CLINARD & BROOKS (113)               | SEMO |
| 1948    | BACOPA ROTUNDIFOLIA NV                             | STODDARD   | 7/26/70  | S. A. SUTTER (154)                   | SEMO |
| 1953    | CONOBEA MULTIFIDA NV                               | SCOTT      | 9/15/76  | OHMART & THOMPSON (1593)             | SEMO |
| 1954    | MIMULUS RINGENS V. RINGENS                         | SCOTT      | 7/7/72   | R. CLINARD (228)                     | SEMO |
| 1954.99 | MIMULUS RINGENS NV                                 | RAY        | 8/2/83   | DELOZIER & RAVEILL (1328)            | UMKC |
| 1961.10 | VERBASCUM BLATTARIA F. ERUBESCENS                  | NEWMADRID  | 6/2/71   | K. CLEMENT (126)                     | SEMO |
| 1961.99 | VERBASCUM BLATTARIA NV                             | BUCHANAN   | 7/12/83  | DELOZIER & RAVEILL (1302)            | UMKC |
| 1961.99 | VERBASCUM BLATTARIA NV                             | CLAY       | 6/24/83  | RAVEILL (1624)                       | UMKC |
| 1961.99 | VERBASCUM BLATTARIA NV                             | PETTIS     | 6/7/84   | DELOZIER (1557)                      | UMKC |
| 1961.99 | VERBASCUM BLATTARIA NV                             | PLATTE     | 7/12/83  | DELOZIER & RAVEILL (1291)            | UMKC |
| 1968    | PENSTEMON ALLUVIUM NV                              | NEWMADRID  | 6/23/71  | K. CLEMENT (155)                     | SEMO |
| 1981    | CHAENORRHINUM MINUS NV                             | SCOTT      | 6/6/78   | OHMART (2105)                        | SEMO |
| 1981    | CHAENORRHINUM MINUS NV                             | WORTH      | 6/1/83   | DELOZIER & RAVEILL (1125)            | UMKC |
| 1982    | VERONICASTRUM VIRGINICUM F. VIRGINICUM             | IRON       | 7/23/67  | COOK (197)                           | SEMO |
| 1985    | VERONICA AMERICANA NV                              | JACKSON    | 8/11/83  | RAVEILL (1815)                       | UMKC |
| 1987.99 | VERONICA PEREGRINA NV                              | GENTRY     | 5/31/83  | DELOZIER & RAVEILL (1098)            | UMKC |
| 1987.99 | VERONICA PEREGRINA NV                              | WORTH      | 6/1/83   | DELOZIER & RAVEILL (1118)            | UMKC |





|         |                                                |              |          |                                 |      |
|---------|------------------------------------------------|--------------|----------|---------------------------------|------|
| 2366    | CENTAUREA CYANUS NV                            | DUNKLIN      | 5/8/71   | K. CLEMENT (97)                 | SEMO |
| 2366    | CENTAUREA CYANUS NV                            | NEWMADRID    | 7/17/72  | R. CLINARD (162)                | SEMO |
| 2370    | CENTAUREA MACULOSA NV                          | ST. FRANCOIS | 7/4/79   | DIRDEN (149)                    | SEMO |
| 2374    | CICHORIUM INTYBUS F. INTYBUS                   | CHRISTIAN    | 8/5/71   | R. CLINARD (260)                | SEMO |
| 2374    | CICHORIUM INTYBUS F. INTYBUS                   | SCOTT        | 7/6/72   | R. CLINARD (86)                 | SEMO |
| 2374.99 | CICHORIUM INTYBUS NV                           | ST. FRANCOIS | 7/4/79   | DIRDEN (143)                    | SEMO |
| 2374.99 | CICHORIUM INTYBUS NV                           | CHARITON     | 8/8/83   | DELOZIER&RAVEILL (1420)         | UMKC |
| 2378    | KRIGIA BIFLORA NV                              | MADISON      | 4/30/76  | S. HILL (NONE)                  | SEMO |
| 2382    | TRAGOPOGON DUBIUS NV                           | PEMISCOT     | 7/17/72  | R. CLINARD (169)                | SEMO |
| 2382    | TRAGOPOGON DUBIUS NV                           | SCOTT        | 6/20/73  | R. CLINARD (NONE)               | SEMO |
| 2382    | TRAGOPOGON DUBIUS NV                           | GENTRY       | 6/1/83   | DELOZIER&RAVEILL (1111)         | UMKC |
| 2382    | TRAGOPOGON DUBIUS NV                           | HARRISON     | 6/1/83   | DELOZIER&RAVEILL (1135)         | UMKC |
| 2384    | TARAXACUM ERYTHROSPERMUM NV                    | FRANKLIN     | 4/2/81   | R. BOLTON (25)                  | SEMO |
| 2384    | TARAXACUM ERYTHROSPERMUM NV                    | SCOTT        | 4/29/81  | K. BRIGGS (69)                  | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | DUNKLIN      | 4/19/80  | R. SCHROEPPLE (11)              | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | JEFFERSON    | 6/25/77  | DESOTO (NONE)                   | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | MADISON      | 4/25/68  | D. MCFARLAND (17)               | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | NEWMADRID    | 7/1/72   | R. CLINARD (79)                 | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | PEMISCOT     | 7/15/72  | R. CLINARD (153)                | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | STONE        | 8/2/72   | R. CLINARD (247)                | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | REYNOLDS     | 4/8/78   | B. BAGE (22)                    | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | WAYNE        | 4/12/84  | D. ANSELM (48)                  | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | STODDARD     | 5/2/70   | C. HILL (11)                    | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | SCOTT        | 5/3/71   | J. BURGER (32)                  | SEMO |
| 2385    | TARAXACUM OFFICINALE NV                        | CALDWELL     | 5/19/83  | DELOZIER&RAVEILL (971)          | UMKC |
| 2385    | TARAXACUM OFFICINALE NV                        | CLINTON      | 5/19/83  | DELOZIER&RAVEILL (944)          | UMKC |
| 2385    | TARAXACUM OFFICINALE NV                        | GENTRY       | 5/31/83  | DELOZIER&RAVEILL (1102)         | UMKC |
| 2385    | TARAXACUM OFFICINALE NV                        | ST. CLAIR    | 4/20/83  | DELOZIER&GIBBS (839)            | UMKC |
| 2385    | TARAXACUM OFFICINALE NV                        | WORTH        | 6/1/83   | DELOZIER&RAVEILL (1120)         | UMKC |
| 2385    | TARAXACUM OFFICINALE NV                        | WRIGHT       | 4/20/83  | DELOZIER&GIBBS (842)            | UMKC |
| 2385    | TARAXACUM OFFICINALE NV                        | PUTNAM       | 7/11/84  | DELOZIER (1584)                 | UMKC |
| 2388.10 | SONCHUS ASPER F. GLANDULOSUS                   | SCOTT        | 9/15/76  | OHMART&THOMPSON (1594)          | SEMO |
| 2388.99 | SONCHUS ASPER NV                               | BUCHANAN     | 7/12/83  | DELOZIER&RAVEILL (1311)         | UMKC |
| 2388.99 | SONCHUS ASPER NV                               | CARROLL      | 8/8/83   | DELOZIER&RAVEILL (1385)         | UMKC |
| 2388.99 | SONCHUS ASPER NV                               | CHARITON     | 8/8/83   | DELOZIER&RAVEILL (1425)         | UMKC |
| 2389    | LACTUCA SCARIOLOA F. SCARIOLOA                 | NEWMADRID    | 6/14/71  | K. CLEMENT (203)                | SEMO |
| 2389.99 | LACTUCA SCARIOLOA NV                           | BUCHANAN     | 7/12/83  | DELOZIER&RAVEILL (1303)         | UMKC |
| 2389.99 | LACTUCA SCARIOLOA NV                           | CHARITON     | 8/8/83   | DELOZIER&RAVEILL (1433)         | UMKC |
| 2389.99 | LACTUCA SCARIOLOA NV                           | COOPER       | 10/10/83 | DELOZIER, RAVEILL&BELLIS (1533) | UMKC |
| 2390.99 | LACTUCA SALIGNA NV                             | MONTGOMERY   | 10/10/83 | DELOZIER, RAVEILL&BELLIS (1513) | UMKC |
| 2390.99 | LACTUCA SALIGNA NV                             | PLATTE       | 7/11/83  | DELOZIER&RAVEILL (1286)         | UMKC |
| 2391.40 | LACTUCA CANADENSIS V. LONGIFOLIA-F. LONGIFOLIA | SCOTT        | 7/10/76  | OHMART (1215)                   | SEMO |
| 2391.60 | LACTUCA CANADENSIS V. LATIFOLIA-F. LATIFOLIA   | CHRISTIAN    | 8/5/72   | R. CLINARD (263)                | SEMO |