

## THE INTRODUCED WEED FLORA OF ILLINOIS

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The more one studies the weed flora of any territory, the more one becomes convinced that there are two classes, a native and an introduced weed flora. The first class depends especially on the extent to which equilibrium has been disturbed and therefore it often becomes largely a matter of judgment as to what shall be considered a weed. This class varies with the community and the conditions. Especially does it represent a response to changed edaphic conditions. This is illustrated by such plants as Witchgrass (*Panicum capillare*), native species of Smartweed, Ragweed, and Cocklebur. There is no question as to whether the above plants should be classified as weeds, but the case is quite otherwise with such plants as *Asclepias incarnata*, *Helenium autumnale*, *Apocynum androsimifolium* and *Sabatia angularis*, all of which are mentioned as weeds in a prominent weed manual. Many others occur which are weeds only under certain conditions. The consideration of this class of weeds is a problem in itself. In the second class, which contains the majority of weeds in any section, the individuals are finding their balance in a new flora, rather than acting directly as a response to altered edaphic conditions, though they are undoubtedly fostered by these conditions. This is the class that is discussed in this paper. The problem of weed introduction into the state becomes a part of the larger problem of plant introduction because any foreign plant may be potentially a weed; and in order to appreciate the development of this flora in Illinois, it becomes necessary to examine records extending over nearly a century.

In 1794, Andre Michaux visited what is now the state of Illinois, in search of plants, and in his *Flora Boreali-americana* which appeared in 1803, he listed a number of plants as having been found "in regione Illinoensis."

In 1826, L. C. Beck, writing in *Silliman's Journal*, later known as "The American Journal of Science and

Arts," published what he called "A Catalogue of the Plants of Illinois." In this list he mentions 8 plants which are now usually regarded as weeds. These are: *Cerastium vulgatum*, *Polygonum Convolvulus*, *Verbascum Thapsus*, *Mollugo verticillata*, *Solanum carolinense*, *Oenothera biennis*, *Polygonum aviculare* and *Veronica peregrina*. The first 3 are known to have been introduced into America from Europe. At least 2 of the remaining 5, *Solanum carolinense* and *Mollugo verticillata*, have probably migrated into Illinois either from the West or from the South. Two more, *Polygonum aviculare* and *Veronica peregrina*, are known to be cosmopolites. The one remaining species, *Oenothera biennis*, evidently belongs in that category of plants which assert themselves as weeds under the cultural conditions brought about by man.

The following 11 immigrants, not before mentioned, were found in 1852, either "in limited quantities" or "as single specimens," as recorded by Brendel; those found in limited quantities were *Dactylis glomerata*, *Digitaria humifusa*, *Rumex obtusifolius*, *Trifolium pratense* and *Veronica arvensis*. Two of these, *Rumex obtusifolius* and *Digitaria humifusa*, may become pronounced weeds. The others are inserted as members of an introduced flora. The remaining 6 were found as single specimens by Brendel in the vicinity of Peoria. They are reported by him as occurring in great abundance eighteen years later (1870). They are *Linaria vulgaris*, *Rumex Acetosella*, *Sonchus asper*, *Cynoglossum officinale*, *Lappula echinata*, and *Leonurus cardiaca*.

By 1859, many additional introduced species had been noted by various collectors. The majority of these were reported by Lapham in 1857, but several represent species added by Vasey and Brendel during the two following years. Lapham's catalogue of Illinois plants appeared in the Transactions of the Illinois State Agricultural Society. In making up the list, he states that he examined extensive collections of plants exhibited at the state fair held at Chicago in 1855. He also had the benefit of information furnished by various collectors of that period, among whom was Dr. S. B. Mead, of Han-

cock County, who was, according to Lapham, the best recorder of Illinois plants up to 1859. Another active botanist of this period was Chas. A. Geyer, who published at least one list of Illinois plants during this interval. Dr. Engelmann, of St. Louis, furnished information concerning the flora in the southern part of the state. In regard to his catalogue, Lapham says, "It will be readily understood that the following is a pretty full list of the plants growing naturally within the state of Illinois." The great increase in additional species represents not only the fact that probably certain parts of the state were settling up rapidly, but possibly even more the stimulation of botanical interest in various parts of the state. The introduced species occurring in this list are placed below. Possibly some of those included were here in 1826, not being seen by Beck; but undoubtedly the majority came in during this period.

## PLANT IMMIGRANTS FROM 1826-1859

<i>Sisymbrium officinale</i>	<i>Satureja hortensis</i>
<i>Sisymbrium Irio</i>	<i>Melissa officinalis</i>
<i>Erysimum cheiranthoides</i>	<i>Nepeta Cataria</i>
<i>Capsella Bursa-pastoris</i>	<i>Nepeta hederacea</i>
<i>Brassica arvensis</i>	<i>Marrubium vulgare</i>
<i>Brassica nigra</i>	<i>Lithospermum arvense</i>
<i>Camelina sativa</i>	<i>Nicandra Physalodes</i>
<i>Radicula Nasturtium-aquaticum</i>	<i>Cannabis sativa</i>
<i>Saponaria officinalis</i>	<i>Delphinium Consolida</i>
<i>Saponaria Vaccaria</i>	<i>Linum usitatissimum</i>
<i>Agrostemma Githago</i>	<i>Solanum Dulcamara</i>
<i>Stellaria media</i>	<i>Rosa rubiginosa</i>
<i>Cerastium viscosum</i>	<i>Chenopodium murale</i>
<i>Portulaca oleracea</i>	<i>Chenopodium album</i>
<i>Malva rotundifolia</i>	<i>Chenopodium Botrysi</i>
<i>Malva sylvestris</i>	<i>Chenopodium ambrosioides</i>
<i>Malva verticillata</i>	<i>Chenopodium anthelminticum</i>
<i>Sida spinosa</i>	<i>Amaranthus hybridus</i>
<i>Abutilon Theophrasti</i>	<i>Amaranthus spinosus</i>
<i>Hibiscus Trionum</i>	<i>Amaranthus retroflexus</i>
<i>Trifolium procumbens</i>	<i>Aethusa Cynapium</i>
<i>Trifolium arvense</i>	<i>Conium maculatum</i>
<i>Melilotus alba</i>	<i>Inula Helenium</i>
<i>Medicago sativa</i>	<i>Anthemis Cotula</i>
<i>Medicago lupulina</i>	<i>Chrysanthemum Leucanthemum</i>
<i>Pastinaca sativa</i>	<i>Cirsium arvense</i>
<i>Bupleurum rotundifolium</i>	<i>Cirsium lanceolatum</i>
<i>Centaurea Cyanus</i>	<i>Arctium minus</i>
<i>Tussilago Farfara</i>	<i>Taraxacum officinale</i>
<i>Grindelia squarrosa</i>	<i>Sonchus oleraceus</i>
<i>Dipsacus sylvestris</i>	<i>Polygonum Persicaria</i>
<i>Plantago lanceolata</i>	<i>Polygonum orientale</i>
<i>Verbascum Blattaria</i>	<i>Rumex crispus</i>
<i>Mentha spicata</i>	<i>Fagopyrum esculentum</i>

## PLANT IMMIGRANTS FROM 1826-1859—Concluded

Eleusine indica  
Eragrostis megastachya  
Bromus secalinus

Echinochloa crusgalli  
Digitaria sanguinalis  
Setaria glauca

The above list contains 74 introduced species, most of them probably coming in during the interval of 33 years. Several of these were possibly introduced originally as crop plants or vegetables, such as *Medicago sativa*, *Pastinaca sativa*, *Linum usitatissimum*, *Cannabis sativa* and *Fagopyrum esculentum*. Several are medicinal plants, ornamentals, or plants of the old-fashioned garden, such as *Marrubium vulgare*, *Melissa officinalis*, *Satureja hortensis*, *Mentha spicata*, *Nepeta Cataria*, *Centaurea Cyanus*, *Delphinium Consolida*, *Polygonum orientale*, *Rosa rubiginosa* and *Aethusa Cynapium*. The remaining species are mostly weeds, the worst possibly being *Cirsium arvense*. The greatest number of introductions was in the family Compositae, with the Cruciferae second.

In 1870, Frederick Brendel, working mainly in the region near Peoria, published an article in the American Entomologist and Botanist entitled, "Distribution of Immigrant Plants." He notes the following—heretofore not mentioned—as "adventitious plants" or "mostly escaped or purposely introduced:—"

Argemone mexicana  
Nasturtium Armoracia  
Anethum graveolens.  
Helianthus annuus

Tanacetum vulgare  
Ipomoea purpurea  
Phalaris canariensis  
Setaria italica

The following additional plants, he says, had been naturalized from an unknown date:—

Hypericum perforatum  
Chenopodium urbicum  
Alepecurus pratensis

Phleum pratense  
Agrostis alba  
Poa compressa

In this list he also mentions *Plantago major*, *Chenopodium hybridum*, *Solanum nigrum* and "*Xanthium strumarium*", all of which are now regarded as indigenous or at least as cosmopolites. *Raphanus raphanistrum* is mentioned as having been found in 1852, but not seen since. Many of the introduced species mentioned by Brendel had already appeared in Lapham's catalogue.

In 1872, H. H. Babcock's "Flora of Chicago and Vicinity" appeared. In this he mentions 47 introduced

plants, all found within 40 miles of Chicago. The following are named in addition to those already mentioned in previous lists:—

*Lycopus europaeus*  
*Datura Stramonium*  
*Festuca elatior*  
*Hordeum jubatum*

*Agropyron repens*  
*Setaria viridis*  
*Callirhœe involucrata*

The last two are possibly indigenous to the state. It is interesting to note that this is the first mention made of *Agropyron repens*.

In 1891, the "Flora of Cook County" by Higley and Raddin came out. It listed a total of 1223 species. In the interval between 1872 and 1891, many new species were introduced, several of which were noted by E. J. Hill, one of the most active collectors in the Chicago region during this period. In 1871, another list was published by J. W. Hewitt in the National History of Illinois, LaSalle County. This contained several more introduced species. The following list contains those species which apparently came in during this interval, a period of 25 years. For convenience the various species are collected into their respective families. The exact year for several of the species is given in the articles consulted. For example, J. E. Arthur, in 1883, was possibly the first to call attention to the appearance in this region of *Galinsoga parviflora*.

## 1872-1897.

*Setaria verticillata*  
*Panicum miliaceum*  
*Eragrostis minor*  
*Lolium perenne*  
*Agropyron biflorum*  
*Agropyron caninum*  
*Cynodon Dactylon*  
*Bromus tectorum*  
*Bromus racemosus*  
*Hemerocallis fulva*  
*Muscari botryoides*  
*Allium vineale*  
*Urtica dioica*  
*Salsola Kali*  
*Cycloloma atriplicifolium*  
*Chenopodium glaucum*  
*Chenopodium Bonus-Henricus*  
*Amaranthus graecizans*  
*Amaranthus blitoides*  
*Amaranthus paniculatus*  
*Oxybaphus nyc-tagineus*

*Silene latifolia*  
*Silene noctiflora*  
*Lychnis alba*  
*Arenaria serpyllifolia*  
*Spergula arvensis*  
*Ranunculus bulbosus*  
*Radicula sylvestris*  
*Sisymbrium altissimum*  
*Lepidium campestre*  
*Lepidium sativum*  
*Lepidium intermedium*  
*Conringia orientalis*  
*Draba verna*  
*Alyssum maritimum*  
*Alyssum alyssoides*  
*Isatis tinctoria*  
*Neslia paniculata*  
*Reseda alba*  
*Sedum acre*  
*Sedum purpureum*  
*Sempervivum tectorum*  
*Hosackia americana*

Trifolium hybridum	Physalis barbadensis
Trifolium stoloniferum	Datura Tatula
Lespedeza striata	Nicotiana rustica
Melilotus officinalis	Veronica agrestis
Euphorbia Cyparissias	Lactuca scariola
Ricinus communis	Tragopogon porrifolius
Malva moschata	Tragopogon pratensis
Gaura parviflora	Galinsoga parviflora
Carum Carvi	Anthemis arvensis
Daucus Carota	Chrysanthemum Parthenium
Lysimachia Nummularia	Cichorium Intybus
Anagallis arvensis	Sonchus arvensis
Convolvulus arvensis	Centaurea Jacea
Ipomoea Hederacea	Artemisia annua
Ipomoea coccinea	Aster angustus
Myosotis scorpioides	Anthemis nobilis
Verbena officinalis	Chrysanthemum Balsamita
Leonurus sibirica	Artemisia longifolia
Galeopsis Tetrahit	Leontodon autumnalis
Solanum rostratum	Hieracium aurantiacum

A large number of species in the above list are common weeds of European nativity. A few are species which have come in from the West, such as *Gaura parviflora*, *Amaranthus blitoides*, *Hosakia americana*, *Solanum rostratum*, and possibly *Cycloloma atriplicifolia*. Two species of *Agropyron*, *A. caninum* and *A. biflorum*, are supposed to have come in from the North or Northwest. They are not common. There are several species originally from the tropics, such as *Amaranthus paniculatus*, *Datura Tatula*, *Galinsoga parviflora*, and *Ricinus communis*. Plants evidently escaping from cultivation are, *Tragopogon porrifolius*, *Lespedeza striata*, *Trifolium hybridum*, *Melilotus officinalis*, *Cichorium Intybus*, *Chrysanthemum Parthenium*, *Alyssum maritimum*, *Alyssum alyssoides*, *Lepidium sativum*, *Reseda alba*, *Hemerocallis fulva*, *Muscari botryoides*, *Myosotis scorpioides*, *Ipomoea coccinea*, *Daucus Carota*, *Carum Carvi*, *Sedum purpureum*, *Sempervivum tectorum* and probably a few others. *Isatis tinctoria*, the English Woad, was found at one point in Chicago. Several others mentioned above are quite rare. *Sisymbrium altissimum*, one of the most notorious of the tumble weeds, appears to have been noticed first about 1890. The greatest number of species for any family during this period is in the Cruciferae, with 9 representatives.

The interval from 1897 to 1921 may be taken conveniently as the last period. The number of introductions

during this period was somewhat less than during the preceding interval. A noticeable feature is the number of species which have come from the West. Several of these have not yet spread far from the railroads, where one would expect the conditions for acclimitization were not the best. The writer is indebted to Dr. H. S. Pepon, of the Lake View High School, Chicago, for the following list of plants coming in during this time.

1897-1921.

Sorghum halepense	Euphorbia marginata
Avena fatua	Euphorbia Peplus
Bromus hordeaceus	Oenothera pallida
Bromus inermis	Oenothera speciosa
Rumex elongatus	Oenothera serrulata
Atriplex argentea	Cynanchum nigrum
Spergularia mariana	Cuscuta Epilinum
Stellaria aquatica	Gilia linearis
Lychnis coronaria	Echium vulgare
Gypsophila muralis	Verbena bipinnatifida
Ranunculus acris	Lamium maculatum
Chelidonium majus	Lamium amplexicaule
Thlaspi arvense	Leonurus Marrubiastrum
Camelina microcarpa	Mentha rotundifolia
Raphanus sativus	Solanum elaeagnifolium
Brassica alba	Physalis Alkekengi
Brassica juncea	Physalis pumila
Brassica Napus	Physalis longifolia
Brassica campestris	Lycium halimifolium
Diptaxis muralis	Petunia violacea
Hesperis matronalis	Plantago aristata
Barbarea vulgaris	Iva xanthifolia
Erysimum asperum	Lepachys columnaris
Polanisia trachysperma	Coreopsis tinctoria
Potentilla recta	Artemisia kansana
Crotalaria sagittalis	Artemisia vulgaris
Trifolium incarnatum	Artemisia procera
Trifolium agrarium	Geranium pusillum
Kallstroemia maxima	Tribulus terrestris
	Arctium minus

An examination of the foregoing list reveals several points of interest. Nearly one-third of the species are introductions from the West. *Barbarea vulgaris*, *Aster angustus* and *Spergularia mariana* are cosmopolites. The first is thought to be indigenous to the Northwest, and to have spread eastward. The case of *Spergularia mariana* is interesting. It is a plant of the Atlantic and Pacific seaboard, and saline regions of the interior, according to Gray's Manual. The tendency to spread eastward is rather striking in the two families Solanaceae and Onagraceae. Plants evidently escaping from cultivation are *Sorghum halepense*, *Bromus inermis*, *Lychnis*

*coronaria*, *Raphanus sativus*, *Brassica alba*, *Brassica Naus*, *Brassica campestris*, *Hesperis matronalis*, *Trifolium incarnatum*, *Physalis Alkekengi*, *Petunia violacea*, *Coreopsis tinctoria*, *Lycium halimifolium*, and possibly *Euphorbia marginata* and *Cynanchum nigrum*. The following, besides two or three already mentioned, are immigrants from the West: *Atriplex argentea*, *Erysimum asperum*, *Crotalaria sagittalis*, *Oenothera pallida*, *Oenothera speciosa*, *Oenothera serrulata*, *Verbena bipinnatifida*, *Solanum elaeagnifolium*, *Physalis pumila*, *Physalis longifolia*, *Plantago aristata* (probably), *Iva xanthifolia*, *Lepachys columnaris*, *Artemisia kansana*, *Polanisia trachysperma*, and probably *Kallstroemia maxima* and *Gilia linearis*. The following is a list by families of the entire introduced flora enumerated in the preceding pages. Shrub and tree introductions, such as *Populus alba*, *Salix alba*, etc., are excluded, as they are hardly to be counted as weeds. It is realized that the list is probably not complete. The nomenclature is that of Gray's Manual, 7th edition.

## GRAMINEAE

*Eleusine indica*, an., Old World trop.  
*Eragrostis magastachya*, an., Eur.  
*Eragrostis minor*, an., Eur.  
*Digitaria sanguinalis*, an., Eur.  
*Digitaria humifusa*, an., Eur.  
*Setaria glauca*, an., Eur.  
*Setaria viridis*, an., Eur.  
*Setaria verticillata*, an., Eur.  
*Setaria italica*, an., Eur.  
*Echinochloa crusgalli*, an., Eur.  
*Bromus secalinus*, an., Eur.  
*Bromus hordeaceus*, an., Eur.  
*Bromus tectorum*, an., Eur.  
*Bromus racemosus*, an., Eur.  
*Bromus inermis*, per., Eur.  
*Dactylis glomerata*, per., Eur.  
*Poa annua*, an., Eur.  
*Poa compressa*, per., Eur.  
*Phalaris canariensis*, an., Eur.  
*Agropyron repens*, per., Eur.  
*Agropyron biflorum*, per., Amer.  
*Agropyron caninum*, per., Amer.  
*Hordeum jubatum*, an., Cosmop.  
*Festuca elatior*, per., Eur.  
*Lolium perenne*, per., Eur.  
*Cynodon Dactylon*, per., Eur.  
*Panicum miliaceum*, an., Eur.  
*Avena fatua*, an., Eur.

## GRAMINEAE—Concluded

*Sorghum halepense*, per., Eur.  
*Phleum pratense*, per., Eur.  
*Agrostis alba*, per., Cosmop.  
*Alopecurus pratensis*, per., Eur.

## LILIACEAE

*Hemerocallis fulva*, per., Eur.  
*Muscari botryoides*, per., Eur.  
*Allium vineale*, per., Eur.

## URTICACEAE

*Urtica dioica*, per., Eur.  
*Cannabis sativa*, an., Asia.  
*Humulus Lupulus*, per., Cosmop.

## POLYGONACEAE

*Polygonum Convolvulus*, an., Eur.  
*Polygonum Persicaria*, an., Eur.  
*Polygonum orientale*, an., India.  
*Polygonum aviculare*, an., Cosmop.  
*Rumex Acetosella*, per., Eur.  
*Rumex crispus*, per., Eur.  
*Rumex elongatus*, per., Eur.  
*Rumex obtusifolius*, per., Eur.  
*Fagopyrum esculentum*, an., Eur.

## CHENOPODIACEAE

- Chenopodium album, an., Eur.  
 Chenopodium murale, an., Eur.  
 Chenopodium Botrys, an., Eur.  
 Chenopodium ambrosioides, an.,  
 Trop. Amer.  
 Chenopodium anthelminticum,  
 an., Trop. Amer.  
 Chenopodium urbicum, an., Eur.  
 Chenopodium Bonus-Henricus,  
 an., Eur.  
 Chenopodium glaucum, an., Eur.  
 Cycloloma atriplifolium, an.,  
 Amer.-west.  
 Atriplex argentea, an., Amer.-  
 west.  
 Salsola Kali, an., Eur.

## AMARANTHACEAE

- Amaranthus retroflexus, an.,  
 Trop. Amer.  
 Amaranthus paniculatus, an.,  
 Trop. Amer.  
 Amaranthus spinosus, an., Trop.  
 Amer.  
 Amaranthus hybridus, an., Trop.  
 Amer.  
 Amaranthus blitoides, an., Amer.  
 west.  
 Amaranthus graecizans, an.,  
 Amer.-west?

## NYCTAGINACEAE

- Oxybaphus nyctagineus, per.,  
 Amer.-west.

## AIZOACEAE

- Mollugo verticillata, an., Amer.-  
 south.

## CARYOPHYLLACEAE

- Cerastium vulgatum, per., Eur.  
 Cerastium viscosum, an., Eur.  
 Saponaria officinalis, per., Eur.  
 Saponaria Vaccaria, an., Eur.  
 Agrostemma Githago, an., Eur.  
 Stellaria media, an., Eur.  
 Stellaria aquatica, per. Eur.  
 Arenaria serpyllifolia, an., Eur.  
 Silene latifolia, per. Eur.  
 Silene noctiflora, an., Eur.  
 Lychnis alba, an., Eur.  
 Lychnis coronaria, per., Eur.  
 Spargularia arvensis, an., Eur.  
 Spargularia mariana, an., Cos-  
 mop.  
 Gypsophila muralis, an., Eur.

## PORTULACACEAE

- Portulaca oleracea, an., Eur.

## RANUNCULACEAE

- Ranunculus bulbosus, per., Eur.  
 Ranunculus acris, per., Eur.  
 Delphinium Consolida, an., Eur.

## PAPAVERACEAE

- Chelidonium majus, bien., Eur.  
 Argemone mexicana, an., Mex.

## CRUCIFERAE

- Sisymbrium officinale, an., Eur.  
 Sisymbrium Irio, an., Eur.  
 Sisymbrium altissimum, an.,  
 Eur.  
 Erysimum cheiranthoides, bien.,  
 Amer.  
 Erysimum asperum, bien., Amer.  
 Capsella Bursa-pastoris, an., Eur.  
 Brassica arvensis, an., Eur.  
 Brassica nigra, an., Eur.  
 Brassica alba, an., Eur.  
 Brassica juncea, an., Asia.  
 Brassica Napus, an., Eur.  
 Brassica campestris, an., Eur.  
 Radicula Nasturtium-aquaticum,  
 per., Eur.  
 Camelina sativa, an., Eur.  
 Camelina microcarpa, an., Eur.  
 Radicula sylvestris, per., Eur.  
 Lepidium campestre, an., Eur.  
 Lepidium sativum, an., Eur.  
 Lepidium intermedium, an., Eur.  
 Conringia orientalis, an., Eur.  
 Draba verna, an., Eur.  
 Alyssum maritimum, an., Eur.  
 Alyssum alyssoides, an., Eur.  
 Nasturtium Armoracia, per.,  
 Eur.  
 Neslia paniculata, an., Eur.  
 Isatis tinctoria, bien., Eur.  
 Thlaspi arvense, an., Eur.  
 Raphanus sativus, an., Eur.  
 Raphanus raphanistrum, an.,  
 Eur.  
 Hesperie matronalis, bien. (or  
 per.), Eur.  
 Barbarea vulgaris, per., Amer.  
 and Eur.  
 Diplotaxis muralis, an., Eur.

## CAPPARIDACEAE

- Polanisia trachysperma, an.,  
 Amer.

## RESEDACEAE

- Reseda alba, an., Eur.

## CRASSULACEAE

- Sedum acre, per., Eur.  
 Sedum purpureum, per., Eur.  
 Sempervivum tectorum, per.,  
 Eur.

## ROSACEAE

- Potentilla recta, per., Eur.  
Rosa rubiginosa, per., Eur.

## LEGUMINOSAE

- Trifolium procumbens, an., Eur.  
Trifolium arvense, an., Eur.  
Trifolium hybridum, per., Eur.  
Trifolium stoloniferum, per.,  
Amer.-west.  
Trifolium incarnatum, an., Eur.  
Trifolium agrarium, an., Eur.  
Trifolium pratense, per., Eur.  
Cassia Tora, an., Amer.-south.  
Melilotus alba, an. (or bien.),  
Eur.  
Melilotus officinalis, an., (or  
bien.), Eur.  
Medicago sativa, per., Eur.  
Medicago lupulina, an., Eur.  
Lespedeza striata, an., E. Asia.  
Hosackia americana, an., Amer.-  
west.  
Crotalaria sagittalis, an., Amer.

## LINACEAE

- Linum usitatissimum, an., Eur.

## GERANIACEAE

- Geranium pusillum, an., Eur.

## ZYGOPHYLLACEAE

- Tribulus terrestris, an., Old  
World.  
Kallstroemia maxima, an., Amer.  
s. w.

## EUPHORBIACEAE

- Euphorbia Cyparissias, per.,  
Eur.  
Euphorbia Peplus, an., Eur.  
Euphorbia marginata, an.,  
Amer.-west.  
Ricinus communis, an., Old  
World Trop.

## MALVACEAE

- Malva rotundifolia, per., Eur.  
Malva sylvestris, bien., Eur.  
Malva verticillata, an., Eur.  
Malva moschata, per., Eur.  
Sida spinosa, an., Trop.  
Abutilon Theophrasti, an., India.  
Hibiscus Trionum, an., Eur.

## HYPERICACEAE

- Hypericum perforatum, per.,  
Eur.

## ONAGRACEAE

- Gaura parviflora, Amer.-west.  
Oenothera pallida, per., Amer.-  
west.  
Oenothera speciosa, per., Amer.-  
west.  
Oenothera serrulata, per., Amer.-  
west.

## UMBELLIFERAE

- Pastinaca sativa, bien., Eur.  
Bupleurum rotundifolium, an.,  
Eur.  
Aethusa Cynapium, an., Eur.  
Conium maculatum, bien., Eur.  
Carum Carvi, bien., Eur.  
Daucus Carota, bien., Eur.  
Anethum graveolens, an., Eur.

## PRIMULACEAE

- Lysimachia Nummularia, per.,  
Eur.  
Anagallis arvensis, an., Eurasia.

## ASCLEPIADACEAE

- Cynanchum nigrum, per., Eur.

## CONVOLVULACEAE

- Convolvulus arvensis, per., Eur.  
Cuscuta Epilinum, an., Eur.  
Ipomoea coccinea, an., Trop.  
Amer.  
Ipomoea hederacea, an. Trop.  
Amer.  
Ipomoea purpurea, an., Trop.  
Amer.

## POLEMONIACEAE

- Gilia linearis, an., Amer.-west.

## BORAGINACEAE

- Echium vulgare, bien., Eur.  
Cynoglossum officinale, bien.,  
Eur.  
Lappula echinata, an., Eur.  
Lithospermum arvense, an., Eur.  
Myosotis scorpioides per., Eur.

## VERBENACEAE

- Verbena bipinnatifida, per.,  
Amer.-west.  
Verbena officinalis, an., Eur.

## LABIATAE

- Leonurus cardiaca, per., Eur.  
Leonurus sibirica, bien., Eur.  
Leonurus Marrubiastrum, bien.,  
Eur.  
Satureja hortensis, an., Eur.  
Melissa officinalis, per., Eur.  
Nepeta Cataria, per., Eur.

## LABIATAE—Concluded

- Nepeta hederacea*, per., Eur.  
*Marrubium vulgare*, per., Eur.  
*Galeopsis Tetrahit*, an., Eur.  
*Lamium maculatum*, per., Eur.  
*Lamium amplexicaule*, an. (or  
 bien.), Eur.  
*Mentha spicata*, per., Eur.  
*Mentha rotundifolia*, per., Eur.  
*Lycopus europaeus*, per., Eur.

## SOLANACEAE

- Solanum carolinense*, per., Amer.  
 west.  
*Solanum rostratum*, an., Amer.  
 west.  
*Solanum nigrum*, an., Cosmop.  
*Solanum elaeagnifolium*, per.,  
 Amer.-west.  
*Solanum Dulcamara*, per., Eur.  
*Nicandra Physalodes*, an., A.  
 Amer.  
*Physalis barbadensis*, an., Amer.  
 west.  
*Physalis Alkekengi*, per., E.  
 Asia.  
*Physalis pumila*, per., Amer.  
 west.  
*Physalis longifolia*, per., Amer.  
 west.  
*Lychium halimifolium*, per., Eur.  
*Petunia violacea*, an., Trop.  
 Amer.  
*Datura Stramonium*, an., Trop.  
 Amer.  
*Datura Tatula*, an., Trop. Amer.  
*Nicotiana rustica*, an., Amer.  
 (probably).

## SCROPHULARIACEAE

- Linaria vulgaris*, per., Eur.  
*Verbascum Thapsus*, bien., Eur.  
*Verbascum Blattaria*, bien., Eur.  
*Veronica agrestis*, an., Eur.  
*Veronica arvensis*, an., Eur.

## PLANTAGINACEAE

- Plantago lanceolata*, per., Eur.  
*Plantago aristata*, an., Amer.  
 west.

## DIPSACACEAE

- Dipsacus sylvestris*, Bien., Eur.

## COMPOSITAE

- Sonchus asper*, an., Eur.  
*Sonchus oleraceus*, an., Eur.  
*Sonchus arvensis*, per., Eur.  
*Tussilago Farfara*, per., Eur.  
*Grindelia squarrosa*, per., Amer.  
 west.  
*Arctium minus*, bien., Eur.  
*Taraxacum officinale*, per., Eur.  
*Centaurea Cyanus*, an., Eur.  
*Centaurea Jacea*, per., Eur.  
*Hieracium aurantiacum*, per.,  
 Eur.  
*Inula Helenium*, per., Eur.  
*Anthemis Cotula*, an., Eur.  
*Anthemis nobilis*, per., Eur.  
*Anthemis arvensis*, an. (or  
 bien.), Eur.  
*Chrysanthemum Leucanthemum*,  
 per., Eur.  
*Chrysanthemum Balsamita*, per.,  
 Asia.  
*Chrysanthemum Parthenium*,  
 per., Eur.  
*Cichorium Intybus*, bien., Eur.  
*Cirsium arvense*, per., Eur.  
*Cirsium lanceolatum*, per., Eur.  
*Aster angustus*, an., Amer.-west.  
*Leontodon autumnalis*, per., Eur.  
*Lactuca scariola*, an., Eur.  
*Tragopogon porrifolius*, bien.,  
 Eur.  
*Tragopogon pratensis*, bien.,  
 Eur.  
*Galinsoga parviflora*, an., Trop.  
 Amer.  
*Artemisia longifolia*, per., Amer.  
 west.  
*Artemisia kansana*, per., Amer.  
 west.  
*Artemisia vulgaris*, per., Eur.  
*Artemisia procera*, per., Eur.  
*Artemisia annua*  
*Coreopsis tinctoria*, an., Amer.  
 west.  
*Lepachys columnaris*, per.,  
 Amer.-west.  
*Iva xanthifolia*, an., Amer.-west.  
*Helianthus annuus*, an., Amer.  
 west.  
*Tanacetum vulgare*, per., Eur.

The data for nativity and duration of the above species were taken from Gray's Manual, 7th edition. The duration of several species, especially those belonging to the Cruciferae, may vary considerably from annual to bien-

nial. The total number of introduced species listed above is 256. Undoubtedly there are several others which should be included. These figures, however, will serve as a basis for estimating the relative weed introduction from various sources. On this basis, 73% are of European origin, 14% come in from West of the Mississippi, 6% are of Tropical American origin, 5% are of Asiatic origin, and 2% are cosmopolitan. As to duration, approximately 32% are perennial, 60% annual and 8% biennial. Every species from Tropical America without exception acts here as an annual, which is to be expected.

The greatest number came in during the period from 1872 to 1897. Apparently the number of introductions during the last 24 years have been 30% less than the number during the preceding 25 years, the average being 2.4 per year as against 3.3 yearly for the preceding interval. The period from 1872 on no doubt represents a rapid settling up of the farmlands of the state, and is naturally correlated with the introduction of many new species. The observations of Dr. H. S. Pepon, one of the most thorough-going students of the flora of the state, are in line with this supposition. In 1876 he noted 355 species in a certain farm, and on the same farm in 1904, only 200, and these, he says, in his observations at the time "are the plebians, toughs, tramps, and rabble. The royal ones are gone."

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