Data on introduced plants in Zimbabwe: Floristic changes and patterns of collection based on historical herbarium records

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**Abstract**

National herbaria with significant historical plant collections are critical to tracking floristic changes and patterns, which include the introduction and spread of non-native plant species. To explore the importance of herbarium specimen data in understanding floristic changes in Zimbabwe, the plant collections housed by the National Herbarium (SRGH) in Harare, Zimbabwe were utilized with historical specimens dating back to 1870. A list of naturalised plant taxa and collection data were compiled. A total of 2916 plant specimens were recorded, comprising of 401 taxa, 237 genera and 76 plant families. Twenty eight specimens (1.0%) were collected between 1870 and 1908, prior to the establishment of the National Herbarium in 1909 and 123 specimens (4.2%) were collected in the first 25 years of the establishment of the institute (1909–1934). Intensive collection of herbarium specimens of casual, naturalised and invasive alien plant species occurred between 1950 and 1970. This data demonstrates the utility of plant species data housed in the National Herbaria and how such data can be used to map floristic changes and patterns.

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The data are critical in tracking floristic changes and patterns of spread of exotic plant species. This data are important for monitoring purposes and also to fill the gaps in plant distributional ranges. This data will contribute to better understanding of the ecological impacts of exotic plant species. List of herbarium specimens of exotic plant species will help in future research on this category of plant species.

### 1. Data

Many non-native plants in Zimbabwe were introduced decades ago through agriculture and horticulture. A number of these exotics now occupy large stretches of land and form characteristic features of the Zimbabwean flora. The number of plant exotics increase with time, 1449 exotic taxa have been recorded in Zimbabwe, a country comprising about 6000 plant species [1]. But only a handful of exotic plant species are represented in local herbaria, although most of these species are known to be widely distributed than indicated in herbaria. This development is unfortunate as herbaria must provide quality specimens and data that represent an overview of floristic changes over time. Herbarium specimens can also be used to document plant distributional changes such as exotic species expansions. Periodic plant collecting expeditions are important for monitoring purposes and also to fill the gaps in plant distributional ranges. Collection of herbarium specimens helps in the identification of invasive exotics and detection of new introductions.

The herbarium specimens usually contain important historical information about plant species which is critical for scientific studies. Such information on herbarium labels includes the identity of the species and other details such as family, habit, plant height, leaf arrangement, shape, size, flower colour, shape and size. Other important information usually included on the herbarium label include details about the collector, his or her name, collector’s number, the locality, year of collection of the plant species, description of the habitat and notes on uses of the plant species if any and also size of the population. For exotic species, experienced collectors usually include information such as life history traits, such as habit, population size and perceived invasion status, whether casual, naturalised or invasive. Pyšek et al. [2] defined a casual alien as a plant species that reproduces occasionally outside cultivation and it does not form self-sustaining populations and relying on repeated introductions for its persistence. According to Pyšek et al. [2], a naturalised species is defined as an alien species that reproduces consistently without direct human intervention, and invasive alien species as a naturalised species that produces offspring in large numbers and at considerable distances from the
parent plants with the potential to spread over a large area. Studies of the distributional history of non-native plant species can provide us with the knowledge of their earliest locations, patterns of colonization and rates of spread. A better understanding of their establishment and distributional changes over time is vital for making informed decisions in managing existing introductions and in predicting future invasions. To explore the importance of herbarium specimen data for understanding floristic changes and patterns in Zimbabwe with regards to non-native plants, herbarium specimens collected in the country that are housed in the National Herbarium of Zimbabwe, Harare were inventoried. The first herbarium records and subsequent temporal collection of each taxa were identified and recorded.

2. Experimental design, materials and methods

Included in this data are those plant species considered to be naturalized in Zimbabwe [1,3,4]. Therefore, a database of casual, naturalised and invasive alien flora [2], occurring in Zimbabwe was compiled based on herbarium records. All alien plant species ever recorded in Zimbabwe as escapes from cultivation or naturalised at least once in the wild, and housed by the National Herbarium, Harare, Zimbabwe (SRGH, acronym adhere to Index Herbariorum) [5], were included in the database. Plant species introduced in Zimbabwe or cultivated without any evidence of having escaped were not considered. Information on herbarium labels, including locality and year of collection of the plant species, was examined and recorded. For each taxon, information on year when the plant species was first collected, mode or purpose of introduction, its invasion status in Zimbabwe and subsequent temporal collection data were extracted from the herbarium records. The mode or purpose of introduction was included, and also whether the introduction was accidental or intentional. The correct identities and names of all the taxa listed were checked and, where names have changed, the currently accepted name was applied. Therefore, plant taxa name, families and plant authorities were verified using taxonomical floras, journal articles and internet sources such as the International Plant Name Index (www.ipni.org), the Missouri Botanical Garden’s Tropicos Nomenclatural database (www.tropicos.org) and the Royal Botanic Garden and Missouri Botanic Garden plant name database (www.theplantlist.org).

A total of 2916 plant specimens were recorded, comprising of 401 taxa, 237 genera and 76 plant families (Table 1). Appendix A provides an alphabetical listing of plants taxa. Close to three quarters of these taxa (77.6%) belong to 19 families given in Table 2. Pant families Asteraceae, Poaceae and Solanaceae accounted for the highest number of species (Table 2). A significant proportion of the exotics (61.6%) are represented in the National Herbarium by between one to five specimens (Table 3). Twenty eight specimens (1.0%) were collected between 1870 and 1908, prior to the establishment of the National Herbarium in 1909 and 123 specimens (4.2%) were collected in the first 25 years of the establishment of the institute (1909–1934) (Fig. 1). Most of the herbarium specimens were collected between 1930 and 1980 (Fig. 1). Intensive collection of herbarium specimens of casual, naturalised and invasive plant species occurred between 1950 and 1970 with reduced collecting activity in
Table 2
Families with five or more casual, naturalised and invasive taxa in Zimbabwe.

| Family    | No. of taxa | %   |
|-----------|-------------|-----|
| Asteraceae| 53          | 13.2|
| Fabaceae  | 51          | 12.7|
| Poaceae   | 49          | 12.2|
| Solanaceae| 21          | 5.2 |
| Brassicaceae| 15        | 3.7 |
| Amaranthaceae| 14         | 3.5 |
| Convolvulaceae| 13        | 3.2 |
| Euphorbiaceae| 13         | 3.2 |
| Myrtaceae | 11          | 2.7 |
| Boraginaceae| 10         | 2.5 |
| Polygonaceae| 10         | 2.5 |
| Chenopodiaceae| 8          | 2.0 |
| Malvaceae | 8           | 2.0 |
| Verbenaceae| 8           | 2.0 |
| Caryophyllaceae| 7        | 1.7 |
| Lamiaceae | 7           | 1.7 |
| Onagraceae| 5           | 1.2 |
| Passifloraceae| 5         | 1.2 |
| Plantaginaceae| 5         | 1.2 |

Table 3
Proportion of plant exotics represented by between one to five specimens in the National Herbarium.

| No. of collections | No. of taxa | %   |
|--------------------|-------------|-----|
| One specimen       | 84          | 20.9|
| Two specimens      | 70          | 17.5|
| Three specimens    | 40          | 10.0|
| Four specimens     | 25          | 6.2 |
| Five specimens     | 28          | 7.0 |
| **Total**          | **247**     | **61.6**|

Fig. 1. The number of herbarium specimens of exotic plant species collected in each decade of the National Herbarium’s history.
the 1990s and 2010 (Fig. 1). A total of 1184 herbarium specimens representing 231 taxa (57.6%) of the exotic species pre-date 1950. By 1970, 2500 herbarium specimens representing 358 taxa (89.3%) had been collected (Appendix A). Results of the present study are important in understanding distributional changes of introduced plant species in Zimbabwe.

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Conflict of interest

There is no conflict of interest in publishing this research paper.

Transparency document. Supporting information

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2017.09.046.

Appendix A. Casual, naturalised and invasive alien flora of Zimbabwe. Taxa are listed alphabetically

| Species                        | Family         | Reasons for introduction | Current status | Earliest herbarium record | 1934  | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|--------------------------------|----------------|--------------------------|----------------|---------------------------|-------|-----------|-----------|--------|---------------------------|
| Abelmoschus esculentus (L.) Moench | Malvaceae     | Food, Fibre             | Casual        | 1933                      | 1     | 3         | 4         |        |                           |
| Acacia baileyana F.Muell.      | Fabaceae      | Ornamental              | Casual        | 1941                      | 1     | 1         | 2         |        |                           |
| Acacia dealbata Link           | Fabaceae      | Ornamental, tanbark     | Naturalised   | 1902                      | 1     | 4         | 5         |        |                           |
| Acacia decurrens Wild. Benth.  | Fabaceae      | Ornamental, tanbark     | Naturalised   | 1903                      | 1     | 3         | 4         |        |                           |
| Acacia elata Benth.            | Fabaceae      | Ornamental              | Naturalised   | 1944                      | 1     | 1         | 2         |        |                           |
| Acacia longifolia (Andrews) Wild. | Fabaceae     | Ornamental, timber      | Casual        | 1932                      | 1     | 2         | 3         |        |                           |
| Acacia mearnsii De Wild.       | Fabaceae      | Ornamental, tanbark, timber | Invasive  | 1931                      | 2     | 3         | 8         | 13     |                           |
| Acacia melanoxylon R.Br.       | Fabaceae      | Ornamental, timber      | Invasive      | 1903                      | 1     | 6         | 7         |        |                           |
| Acacia podalyriifolia G.Don    | Fabaceae      | Ornamental              | Naturalised   | 1971                      | 1     | 1         | 1         |        |                           |
| Species                          | Family         | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|---------------------------------|----------------|--------------------------|---------------|---------------------------|-------|-----------|-----------|-------|--------------------------|
| Acacia salicina Lindl.          | Fabaceae       | Ornamental               | Casual        | 1993                      | 1     | 1         |           |       |                          |
| Acalypha amen-tacea subsp.      | Euphorbiaceae  | Ornamental               | Casual        | 1974                      | 4     | 4         |           |       |                          |
| Acanthospermum australae        | Asteraceae     | Unintentional            | Invasive      | 1930                      | 3     | 11        | 8         | 1     | 23                       |
| Acanthospermum glabratum (DC.)  | Asteraceae     | Unintentional            | Naturalised   | 1951                      | 2     | 5         |           |       | 7                        |
| Acanthospermum hispidum DC.     | Asteraceae     | Unintentional            | Invasive      | 1917                      | 1     | 15        | 11        |       | 27                       |
| Achillea millfolium L.          | Asteraceae     | Medicinal                | Casual        | 1942                      | 1     | 2         |           |       | 3                        |
| Achyanthes aspera L var.        | Amaranthaceae  | Unintentional            | Invasive      | 1960                      | 10    | 13        | 16        | 3     | 42                       |
| Achyanthes aspera L var.        | Amaranthaceae  | Unintentional            | Invasive      | 1941                      | 4     | 2         |           |       | 6                        |
| Adiantum rad-dianum C. Presl    | Pteridaceae    | Ornamental               | Naturalised   | 1905                      | 2     | 10        | 4         |       | 18                       |
| Agave americana L.              | Asparagaceae   | Fibre, ornamental        | Naturalised   |                           |       |           |           |       | NA                       |
| Agave sisalana Perrine          | Asparagaceae   | Fibre, ornamental        | Naturalised   |                           |       |           |           |       | NA                       |
| Ageratina adenophora (Spreng.)  | Asteraceae     | Ornamental               | Invasive      | 1945                      | 1     | 1         | 1         |       | 3                        |
| Ageratum conyzoides L.          | Asteraceae     | Ornamental               | Invasive      | 1943                      | 1     | 11        | 2         |       | 14                       |
| Ageratum houstonianum Mill.     | Asteraceae     | Ornamental               | Naturalised   | 1955                      | 1     |           |           |       | 1                        |
| Albizia procera (Roxb.) Benth.  | Fabaceae       | Ornamental               | Casual        | 1929                      | 1     | 3         |           |       | 4                        |
| Alisma plantago-aquatica L.     | Alismataceae   | Ornamental               | Naturalised   | 1972                      | 1     |           |           |       | 1                        |
| Alternanthera caracasana Kunch  | Amaranthaceae  | Unintentional            | Naturalised   | 1931                      | 2     | 2         | 3         |       | 7                        |
| Alternanthera nodiflora R.Br.   | Amaranthaceae  | Unintentional            | Naturalised   | 1921                      | 1     | 20        | 26        |       | 47                       |
| Alternanthera pungens Kunch     | Amaranthaceae  | Unintentional            | Naturalised   | 1931                      | 2     | 6         | 17        | 1     | 26                       |
| Alternanthera sessilis (L.) R.  | Amaranthaceae  | Unintentional            | Naturalised   | 1946                      | 4     | 20        | 2         |       | 26                       |
| Amaranthus dubius Mart. ex Thell.| Amaranthaceae  | Unintentional            | Casual        | 1960                      | 1     | 1         |           |       | 2                        |
| Species | Family | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987+ | Total herbarium specimens |
|---------|--------|--------------------------|----------------|---------------------------|--------|------------|------------|------|-------------------------|
| Amaranthus hybridus L. ssp. cruentus (L.) Thell. | Amaranthaceae | Food | Naturalised | 1952 | 2 | 1 | 1 | 4 |
| Amaranthus hybridus subsp. hybridus | Amaranthaceae | Food | Naturalised | 1918 | 6 | 8 | 13 | 1 | 28 |
| Amaranthus spinosus L. | Amaranthaceae | Food | Invasive | 1931 | 1 | 9 | 17 | 1 | 28 |
| Amaranthus viridis L. | Amaranthaceae | Food | Invasive | 1942 | 1 | 4 | 5 |
| Ambrosia maritima L. | Asteraceae | Unintentional | Naturalised | 1946 | 3 | 3 |
| Amsinckia menziesii (Lehm.) A. Nelson & J.F. Macbr. | Boraginaceae | Unintentional | Casual | 1980 | 1 | 1 |
| Anagallis arvensis L. ssp. arvensis | Primulaceae | Unintentional | Casual | 1953 | 1 | 1 | 2 |
| Apium leptophyllum (DC.) E.Muell. | Apiaceae | Unintentional | Naturalised | 1923 | 1 | 12 | 4 | 17 |
| Arachis hypogea L., 1753 | Fabaceae | Food | Casual | 1952 | 1 | 1 |
| Argemone mexicana L. | Papaveraceae | Unintentional | Invasive | 1918 | 4 | 8 | 18 | 30 |
| Aristolochia littoralis D. Parodi | Aristolochiaceae | Ornamental | Casual | 1968 | 1 | 1 |
| Arundo donax L. | Poaceae | Ornamental | Invasive | 1958 | 1 | 1 |
| Asclepias curassavica L. | Apocynaceae | Ornamental | Casual | 1965 | 2 | 2 |
| Avena fatua L. | Poaceae | Fodder | Casual | 1958 | 2 | 5 | 2 |
| Avena sativa L. | Poaceae | Food | Casual | 1975 | 4 | 4 |
| Avena sterilis subsp. ludoviciana | Poaceae | Fodder | Casual | 1969 | 5 | 5 |
| Axonopus compressus (Sw.) P. Beauv. | Poaceae | Ornamental | Naturalised | 1976 | 1 | 1 |
| Axonopus fissifolius (Raddi) Kuhl. | Poaceae | Ornamental | Naturalised | 1943 | 2 | 2 | 1 | 5 |
| Azolla filiculoides Lam. | Azollaceae | Ornamental | Invasive | 1983 | 1 | 1 | 2 |
| Bambusa vulgaris Schrad. | Poaceae | Ornamental | Casual | 1961 | 1 |
| Bauhinia variegata L. var. candida Voigt | Fabaceae | Ornamental | Naturalised | 1923 | 4 | 8 | 1 | 13 |
| Bidens bipinnata L. | Asteraceae | Unintentional | Invasive | 1969 | 1 | 1 |
| Bidens bitemnata (Lour.) Merr. & Sherff | Asteraceae | Unintentional | Naturalised | 1920 | 1 | 15 | 6 | 22 |
| Bidens pilosa L. | Asteraceae | Unintentional | Invasive | 1906 | 6 | 13 | 12 | 1 | 32 |
| Boerhavia coccinea Mill. | Nyctagineaceae | Unintentional | Casual | 1933 | 1 | 9 | 12 | 32 |

(continued )
| Species                        | Family        | Reasons for introduction | Current status  | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 | Total herbarium specimens |
|-------------------------------|---------------|--------------------------|-----------------|---------------------------|-------|------------|------------|------|--------------------------|
| Boerhavia diffusa L.         | Nyctagineae   | Unintentional            | Naturalised     | 1906                      | 5     | 8          | 11         | 24   |                          |
| Boerhavia erecta L.          | Nyctagineae   | Unintentional            | Naturalised     | 1977                      | 1     | 1          | 2          | 2    |                          |
| Brachiaria mutica (Forssk.)  | Poaceae       | Ornamental               | Casual          | 1957                      | 1     | 1          | 2          |      |                          |
| Brachiaria ramosa (L.)       | Poaceae       | Fodder                   | Casual          | 1976                      | 2     | 2          |            |      |                          |
| Brachiaria umbellata (Trin.) | Poaceae       | Ornamental               | Casual          | 1962                      | 1     | 1          |            |      |                          |
| Brassica juncea (L.) Czern.  | Brassicaceae  | Food                     | Casual          | 1912                      | 1     | 8          | 2          | 11   |                          |
| Brassica rapa L.             | Brassicaceae  | Food                     | Casual          | 1941                      | 2     |            |            | 2    |                          |
| Briza maxima L.              | Poaceae       | Unintentional            | Naturalised     | 1925                      | 1     | 1          | 5          | 7    |                          |
| Briza minor L.               | Poaceae       | Unintentional            | Naturalised     | 1931                      | 2     | 1          |            | 3    |                          |
| Bromus catharticus Vahl      | Poaceae       | Fodder                   | Naturalised     | 1922                      | 6     | 7          | 11         | 1    | 25                       |
| Bromus diandrus Roth         | Poaceae       | Ornamental               | Casual          | 1977                      | 1     | 1          |            |      |                          |
| Bromus hordacea-ces L. ssp. fer-ronii (Mabille) P.M. Sm. | Poaceae | Fodder | Casual | 1969 | 1 | 1 | | | |
| Bromus leptocladus Nees      | Poaceae       | Fodder                   | Casual          | 1931                      | 1     | 6          | 3          | 1    | 11                       |
| Browallia americana L.       | Solanaceae    | Ornamental               | Invasive        | 1954                      | 1     | 2          |            | 3    |                          |
| Bryophyllum proflferum Bowie | Crassulaceae  | Ornamental               | Casual          | 1931                      | 1     | 2          | 1          | 4    |                          |
| Bryophyllum tubiflorum Harv. | Crassulaceae  | Ornamental               | Naturalised     | 1947                      | 1     | 1          |            |      |                          |
| Buddleja davidii Franch.     | Scrophulariaceae | Ornamental            | Casual          | 1949                      | 1     | 1          |            |      |                          |
| Caesalpinia decapeta (Roth)  | Fabaceae      | Ornamental               | Naturalised     | 1925                      | 2     | 5          | 5          | 12   |                          |
| Cajanus cajan (L.) Millsp.   | Fabaceae      | Food                     | Casual          | 1959                      | 1     | 2          |            | 3    |                          |
| Calceolaria tripartita Ruiz & Pav. | Calceolariaceae | Ornamental           | Casual          | 1949                      | 1     | 1          |            | 2    |                          |
| Callistemon viminalis (Sol. ex Gaertn.) G. Don | Myrtaceae | Ornamental | Naturalised | 1956 | 1 | 1 | | | |
| Callitris calcarata F.Muell. | Cupressaceae  | Ornamental, Timber       | Naturalised     | 1908                      | 1     | 2          |            | 3    |                          |
| Calotropis procura (Aiton) W. T. Aiton | Apocynaceae | Ornamental            | Naturalised     | 1951                      | 1     | 1          | 1          | 3    |                          |
| Cannabis sativa L.           | Cannaceae     | Ornamental, Casual       | Naturalised     | 1929                      | 1     | 3          | 1          | 5    |                          |
| Capsella bursapastoris (L.)  | Brassicaceae  | Food                     | Naturalised     | 1942                      | 5     | 2          |            | 7    |                          |
| Species | Family | Reasons for introduction | Current status | Earliest herbarium record | < 1934 | 1935-1960 | 1961-1986 | 1987+ | Total herbarium specimens |
|---------|--------|------------------------|----------------|--------------------------|---------|------------|-----------|------|--------------------------|
| Capsicum annuum var. glabriusculum (Dunal) Heiser & Pickersgill | Solanaceae | Food | Casual | 1948 | 3 | 2 | 5 |
| Cardamine flexuosa With. | Brassicaceae | Food | Naturalised | 1944 | 2 | 3 | 5 |
| Cardamine hirsuta L. | Brassicaceae | Unintentional | Casual | 1952 | 1 | 1 |
| Cardiopterum grandiflorum Sw. | Sapindaceae | Ornamental | Naturalised | 1947 | 1 | 1 |
| Catharanthus roseus (L.) G. Don | Apocynaceae | Ornamental | Casual | 1932 | 1 | 6 | 3 | 10 |
| Centaurea melitensis L. | Asteraceae | Ornamental | Naturalised | 1953 | 1 | 1 | 2 |
| Centratherum punctatum Cass. ssp. punctatum | Asteraceae | Ornamental | Naturalised | 1958 | 1 | 1 | 2 |
| Centrosema pubescens Benth. | Fabaceae | Unintentional | Casual | 1912 | 1 | 6 | 6 | 13 |
| Cerastium glomeratum Thuill. | Caryophyllaceae | Unintentional | Casual | 1955 | 3 | 3 |
| Cestrum aurantiacum Lindl. | Solanaceae | Ornamental | Naturalised | 1959 | 1 | 1 |
| Chamaecrista rotundifolia (Pers.) Greene | Fabaceae | Unintentional | Naturalised | 1955 | 1 | 1 | 2 |
| Chenopodium album L. | Chenopodiaceae | Food | Invasive | 1922 | 3 | 6 | 2 | 1 | 12 |
| Chenopodium giganteum D. Don | Chenopodiaceae | Unintentional | Casual | 1936 | 3 | 2 | 5 |
| Chenopodium hederiforme (Murray) Aellen | Chenopodiaceae | Unintentional | Casual | 1956 | 2 | 1 | 3 |
| Chenopodium murale L. | Chenopodiaceae | Unintentional | Naturalised | 1931 | 2 | 8 | 3 | 13 |
| Chenopodium opulifolium Schrad. ex W. D. J. Koch & Ziz | Chenopodiaceae | Unintentional | Naturalised | 1931 | 2 | 1 | 3 | 6 |
| Chromolaena odorata (L.) R. M. King & H. Rob. | Asteraceae | Ornamental | Casual | 1967 | 1 | 1 |
| Cichorium intybus L. | Asteraceae | Food, medicinal | Casual | 1944 | 2 | 2 | 4 |
| Citrus aurantium L. | Rutaceae | Food | Casual | 1947 | 1 | 1 | 2 |
| Citrus limon (L.) Burm. f. | Rutaceae | Food | Casual | 1916 | 2 | 3 | 2 | 7 |
| Cobaea scandens Cav. | Cobaeeae | Unintentional | Naturalised | 1957 | 1 | 2 | 3 |
| Species                  | Family       | Reasons for introduction | Current status       | Earliest herbarium record | < 1934 | 1935-1960 | 1961-1986 | 1987 | Total herbarium specimens |
|-------------------------|--------------|--------------------------|----------------------|---------------------------|--------|------------|------------|-----|--------------------------|
| Coffea arabica L.       | Rubiaceae    | Food                     | Naturalised          | 1927                      | 2      | 2          | 3          | 7   |                          |
| Colocasia esculenta (L.) Schott | Araceae    | Food                     | Naturalised          | 1962                      |        | 2          |            | 8   |                          |
| Conium maculatum L.     | Apiaceae     | Food                     | Casual               | 1974                      | 1      | 1          |            | 1   |                          |
| Coreopsis lanceolata L. | Asteraceae   | Ornamental               | Invasive             | 1975                      | 3      | 3          |            |     |                          |
| Corymbia citroidora (Hook.) K. D.Hill & L.A.S. Johnson | Myrtaceae | Timber                   | Naturalised          | 1904                      | 1      | 1          |            | 2   |                          |
| Cosmos bipinnatus Cav.   | Asteraceae   | Ornamental               | Naturalised          | 1931                      | 1      | 2          | 1          | 4   |                          |
| Cosmos sulphureus Cav.   | Asteraceae   | Ornamental               | Casual               | 1932                      | 1      | 4          | 5          | 10  |                          |
| Cotoneaster pannonius Franch. | Rosaceae | Ornamental               | Naturalised          | 1965                      | 1      | 1          |            |     |                          |
| Crotalaria distans      | Fabaceae     | Green                    | Manure               | 1920                      | 1      | 1          |            | 2   |                          |
|                        |              |                          |                      |                           |        |            |            |     |                          |
| Crotalaria juncea L.    | Fabaceae     | Fibre                    | Naturalised          | 1945                      | 1      | 1          |            | 2   |                          |
| Crotalaria pallida Aiton var. pallida | Fabaceae | Green                    | Naturalised          | 1936                      | 7      | 1          |            | 8   |                          |
| Cucumis anguria L. var. anguria | Cucurbitaceae | Food                     | Naturalised          | 1932                      | 1      | 1          | 1          | 3   |                          |
| Cucumis melo L.         | Cucurbitaceae | Food                     | Casual               | 1953                      | 1      | 1          |            | 1   |                          |
| Cupressus lusitanica Mill. | Cupressaceae | Food                     | Ornamental, Timber    | 1900                      | 1      | 2          | 1          | 4   |                          |
| Cupressus torulosa D.Don | Cupressaceae | Ornamental, Timber       | Casual               | 1895                      | 1      | 1          |            | 2   |                          |
| Cuscuta campes-tris Yunck | Convolvulaceae | Unintentional            | Invasive             | 1948                      | 7      | 10         | 1          | 18  |                          |
| Cuscuta suaveolens Ser. | Convolvulaceae | Unintentional            | Naturalised          | 1936                      | 1      | 1          |            | 2   |                          |
| Cylindropuntia fulgida (Engelm.) F.M. Knuth | Cactaceae | Ornamental               | Invasive             | 1973                      |        |            |            | 1   |                          |
| Cynodon aethiopicus Clayton & Harlan | Poaceae | Fodder                   | Casual               | 1931                      | 1      | 2          | 13         | 16  |                          |
| Cynodon nlemfuensis Van deryst var. nlemfuensis | Poaceae | Fodder                   | Casual               | 1917                      | 6      | 4          | 17         | 1   |                          |
| Cynodon nlemfuensis Van deryst var. robustus Clayton & Harlan | Poaceae | Fodder                   | Casual               | 1922                      | 3      | 4          |            | 4   |                          |
| Cyperus rotundus L.     | Cyperaceae   | Unintentional            | Casual               | 1971                      | 1      | 1          |            |     |                          |
| Dactylis glomerata L.   | Poaceae      | Fodder                   | Casual               | 1965                      | 4      | 4          |            |     |                          |
| Species                   | Family               | Reasons for introduction | Current status | Earliest herbarium record | < 1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|--------------------------|----------------------|--------------------------|----------------|---------------------------|---------|-----------|-----------|--------|---------------------------|
| Dahlia pinnata Cav.      | Asteraceae           | Ornamental               | Casual         | 1970                      | 1       | 1         |           |        | 1                         |
| Dalbergia sissoo DC.     | Fabaceae             | Ornamental               | Naturalised    | 1910                      | 5       | 4         | 8         |        | 17                        |
| Datura inoxia P. Mill.   | Solanaceae           | Ornamental               | Invasive       | 1957                      | 3       | 3         | 1         |        | 7                         |
| Datura quercifolia Kunth  | Solanaceae           | Ornamental               | Invasive       | 1941                      | 9       |           |           |        | 9                         |
| Datura stramonium L.     | Solanaceae           | Ornamental               | Invasive       | 1906                      | 2       | 7         | 1         |        | 10                        |
| Desmodium tortuosum (Sw.) DC. | Fabaceae           | Green Manure            | Naturalised    | 1919                      | 3       | 4         | 7         |        | 14                        |
| Desmodium triflorum (L) DC. | Fabaceae            | Unintentional            | Naturalised    | 1935                      | 1       | 1         |           |        | 2                         |
| Desmodium uncinatum (Jacq.) DC. | Fabaceae           | Unintentional            | Naturalised    | 1967                      | 5       |           |           |        | 5                         |
| Dichanthium aristatum (Poir.) C.E. Hubb. | Poaceae            | Fodder                   | Casual         | 1920                      | 2       |           |           |        | 2                         |
| Dichondra micrantha Urb. | Convolvulaceae       | Unintentional            | Invasive       | 1945                      | 1       | 2         |           |        | 3                         |
| Digitalis purpurea L.    | Plantaginaceae       | Ornamental               | Casual         | 1969                      | 1       |           |           |        | 1                         |
| Dolichandra unguis-cati (L) L.G. Lohmann | Bignoniaceae   | Ornamental               | Naturalised    | 1958                      | 1       | 1         |           |        | 2                         |
| Dolichandra unguis-cati (L) L.G. Lohmann | Bignoniaceae   | Ornamental               | Casual         | 1967                      | 1       |           |           |        | 1                         |
| Duranta erecta L.        | Verbenaceae          | Ornamental               | Invasive       | 1905                      | 5       | 16        | 18        |        | 39                        |
| Dysphania ambrosioides (L) Mosyakin & Clements | Chenopodiaceae  | Unintentional            | Invasive       | 1906                      | 5       | 16        | 20        | 1      | 42                        |
| Dysphania carinata (R. Br.) Mosyakin & Clements | Chenopodiaceae  | Unintentional            | Naturalised    | 1939                      | 1       | 3         |           |        | 4                         |
| Dysphania schraderiana (Schult.) Mosyakin & Clements | Chenopodiaceae  | Unintentional            | Naturalised    | 1920                      | 3       | 7         | 2         |        | 12                        |
| Echinochloa crusgalli var. crusgalli (L.) P. Beauv. | Poaceae            | Unintentional            | Casual         | 1970                      | 2       |           |           |        | 2                         |
| Echinochloa frumentacea Link | Poaceae            | Ornamental               | Casual         | 1944                      | 5       | 3         |           |        | 8                         |
| Echium plantagineum L.   | Boraginaceae         | Ornamental               | Naturalised    | 1918                      | 3       | 2         |           |        | 5                         |
| Eclipta prostrata (L) L. | Asteraceae           | Unintentional            | Invasive       | 1931                      | 1       | 1         |           |        | 2                         |
| Egeria densa Planch.     | Hydrocharitaceae     | Ornamental               | Casual         | 1950                      | 1       | 1         |           |        | 2                         |
| Species                          | Family          | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|---------------------------------|-----------------|--------------------------|----------------|---------------------------|-------|-----------|-----------|-------|---------------------------|
| Eichhornia crassipes (Mart.) Solms | Pontederiaceae  | Ornamental               | Invasive       | 1944                      | 4     | 5         |           |       | 9                         |
| Emex australis Steinh.          | Polygonaceae    | Unintentional            | Casual         | 1922                      | 1     | 2         |           |       | 3                         |
| Eragrostis tef (Zucc.) Trotter  | Poaceae         | Food                     | Casual         | 1912                      | 7     | 2         | 4         |       | 13                        |
| Erigeron canadensis L.          | Asteraceae      | Unintentional            | Invasive       | 1903                      | 1     | 4         | 6         |       | 11                        |
| Erigeron floribundus (Kunth) Sch. Bip. | Asteraceae   | Unintentional            | Invasive       | 1931                      | 3     | 8         | 12        |       | 23                        |
| Erigeron karvinskianus DC.      | Asteraceae      | Ornamental               | Invasive       | 1967                      | 4     | 4         |           |       | 4                         |
| Erigeron primulifolius (Lam.) Greuter | Asteraceae   | Unintentional            | Invasive       | 1932                      | 1     | 7         | 11        |       | 19                        |
| Eruca vesicaria subsp. sativa (Mill.) Thell. | Brassicaceae | Food                     | Casual         | 1956                      | 1     | 2         |           |       | 3                         |
| Erucastrum arabicum Fisch. & C.A. Mey. var. arabicum | Brassicaceae | Unintentional            | Casual         | 1912                      | 1     | 1         |           |       | 2                         |
| Eucalyptus camaldulensis Dehnh. | Myrtaceae       | Timber                   | Naturalised    | 1897                      | 1     | 2         | 3         | 1     | 7                         |
| Eucalyptus globulus Labill.     | Myrtaceae       | Timber                   | Invasive       | 1971                      | 1     | 1         |           |       | 1                         |
| Eucalyptus grandis W. Hill ex Maiden | Myrtaceae   | Timber                   | Naturalised    | 1957                      | 3     | 3         |           |       | 3                         |
| Eucalyptus robusta Sm.          | Myrtaceae       | Timber                   | Naturalised    | 1969                      | 1     | 1         |           |       | 1                         |
| Eucalyptus tereticornis Sm.     | Myrtaceae       | Timber                   | Naturalised    | 1908                      | 1     | 1         |           |       | 2                         |
| Euphorbia cya-thophora Murray   | Euphorbiaceae  | Ornamental               | Invasive       | 1924                      | 1     | 1         |           |       | 2                         |
| Euphorbia heterophylla L.       | Euphorbiaceae  | Unintentional            | Invasive       | 1956                      | 1     | 1         |           |       | 2                         |
| Euphorbia hirta L.              | Euphorbiaceae  | Unintentional            | Invasive       | 1917                      | 5     | 10        | 11        |       | 26                        |
| Euphorbia indica Lam.           | Euphorbiaceae  | Unintentional            | Invasive       | 1948                      | 1     | 1         |           |       | 2                         |
| Euphorbia peplus L.             | Euphorbiaceae  | Unintentional            | Naturalised    | 1953                      | 1     | 1         |           |       | 2                         |
| Euphorbia prostrata Alton       | Euphorbiaceae  | Unintentional            | Invasive       | 1931                      | 2     | 8         | 7         |       | 17                        |
| Euphorbia serpens Kunth         | Euphorbiaceae  | Unintentional            | Invasive       | 1922                      | 3     | 3         | 3         | 3     | 11                        |
| Euphorbia tiri- ucali L.        | Euphorbiaceae  | Ornamental               | Invasive       | 1931                      | 1     | 2         | 1         |       | 4                         |
| Euryops chrysanthemoides (DC.) B. Nord. | Asteraceae | Ornamental               | Naturalised    | 1942                      | 1     | 1         |           |       | 2                         |
| Fagopyrum esculentum Moench.    | Polygonaceae    | Unintentional            | Casual         | 1919                      | 2     | 3         | 3         |       | 8                         |
| Species                      | Family     | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|------------------------------|------------|---------------------------|----------------|---------------------------|-------|------------|------------|-------|--------------------------|
| Flaveria bidentis (L.) Kuntze | Asteraceae | Unintentional Naturalised | 1949           | 1                         | 2     | 3          |            |       |                          |
| Flaveria trinervia (Spreng.) C. Mohr | Asteraceae | Unintentional Invasive    | 1931           | 3                         | 8     | 20         | 31         |       |                          |
| Foeniculum vulgare Mill.     | Apiaceae   | Food                      | 1958           | 1                         |       | 1          |            |       |                          |
| Fumaria muralis W.D.J.Koch   | Papaveraceae| Ornamental Naturalised    | 1956           | 1                         |       | 1          |            |       |                          |
| Galinsoga parviflora Cav.    | Asteraceae | Unintentional Invasive    | 1926           | 4                         | 12    | 11         | 2          | 29    |                          |
| Galinsoga quadriradiata Ruiz & Pav. | Asteraceae | Unintentional Naturalised | 1934           | 1                         | 1     | 2          |            |       |                          |
| Gnaphalium purpureum L.      | Asteraceae | Unintentional Invasive    | 1950           | 7                         | 6     | 13         |            |       |                          |
| Gomphocarpus physocarpus E. Mey. | Apocynaceae| Ornamental Naturalised    | 1942           | 1                         | 1     | 2          |            |       |                          |
| Gomphrena celosioides Mart.  | Amaranthaceae| Unintentional Invasive   | 1917           | 2                         | 10    | 12         | 24         |       |                          |
| Gomphrena globosa L.         | Amaranthaceae| Unintentional Casual      | 1955           | 1                         | 1     | 2          |            |       |                          |
| Gossypium hirsutum L.        | Malvaceae  | Fibre                     | 1927           | 1                         | 1     | 2          |            |       |                          |
| Grevillea robusta A. Cunn. ex R. Br. | Proteaceae| Ornamental, Invasive      | 1976           | 1                         |       | 1          |            |       |                          |
| Guilleminia densa (Humb. & Bonpl. ex Schult.) Moq. | Amaranthaceae| Unintentional Invasive   | 1959           | 1                         | 9     | 10         |            |       |                          |
| Harpachne schimperi A. Rich. | Poaceae    | Unintentional Naturalised | 1991           | 1                         |       | 1          |            |       |                          |
| Hedychium gardnerianum Sheppard ex Ker Gawl. | Zingiberaceae| Unintentional Naturalised | 1968           | 1                         |       | 1          |            |       |                          |
| Heliotropium amplexicaule Vahl | Boraginaceae| Unintentional Casual      | 1942           | 1                         | 1     | 2          |            |       |                          |
| Heliotropium indicum L.      | Boraginaceae| Unintentional Naturalised | 1953           | 3                         | 6     | 9          |            |       |                          |
| Holcus lanatus L.            | Poaceae    | Unintentional Casual      | 1950           | 1                         |       | 1          |            |       |                          |
| Holmsanthus populifolius Graham | Euphorbiaceae| Unintentional Naturalised | 1943           | 3                         | 3     | 6          |            |       |                          |
| Hydrocotyle ranunculoides Lf. | Apiaceae   | Unintentional Casual      | 1964           | 1                         |       | 1          |            |       |                          |
| Hypochaeris radicata L.      | Asteraceae | Unintentional Naturalised | 1952           | 1                         | 4     | 5          |            |       |                          |
| Hyiptis pectinata (L.) Poit. | Lamiaceae  | Unintentional Naturalised | 1963           | 1                         |       | 1          |            |       |                          |
| Hyiptis spicigera Lam.       | Lamiaceae  | Unintentional Casual      | 1955           | 1                         | 1     | 2          |            |       |                          |
| Hyiptis suaveolens (L.) Poit. | Lamiaceae  | Unintentional Casual      | 1945           | 1                         | 1     | 2          |            |       |                          |
| Species | Family | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|---------|--------|--------------------------|---------------|---------------------------|-------|------------|------------|--------|--------------------------|
| Imperata cylindrica (L.) Raeusch. | Poaceae | Unintentional | Casual | 1973 | 1 | 1 | | | |
| Indigofera microcarpa Desv. | Fabaceae | Unintentional | Naturalised | 1930 | 1 | 7 | 6 | 14 | |
| Ipomoea alba Lam. | Convolvulaceae | Unintentional | Naturalised | 1947 | 1 | 1 | | | |
| Ipomoea batatas (L.) Lam. | Convolvulaceae | Food | Casual | 1918 | 1 | 1 | 1 | 3 | |
| Ipomoea carnea subsp. fistulosa (Mart. ex Choisy) D.F. Austin | Convolvulaceae | Ornamental | Naturalised | 1947 | 1 | 1 | 2 | | |
| Ipomoea hederifolia L. | Convolvulaceae | Ornamental | Casual | 1978 | 1 | 1 | | | |
| Ipomoea indica (Burm.) Merr. var. acuminata (Vahl) Fosberg | Convolvulaceae | Ornamental | Naturalised | 1959 | 1 | 1 | | | |
| Ipomoea nil (L.) Roth | Convolvulaceae | Unintentional | Casual | 1907 | 1 | 1 | 1 | 3 | |
| Ipomoea purpurea (L.) Roth | Convolvulaceae | Ornamental | Invasive | 1917 | 1 | 1 | | | |
| Ipomoea tricolor Cav. | Convolvulaceae | Ornamental | Naturalised | 1976 | 1 | 1 | 2 | | |
| Ipomoea tubinata Lag. | Convolvulaceae | Unintentional | Casual | 1952 | 1 | 1 | | 2 | |
| Jacaranda mimosifolia D. Don | Bignoniaceae | Ornamental | Invasive | 1922 | 1 | 4 | 5 | | |
| Jatropha curcas L. | Euphorbiaceae | Ornamental | Naturalised | 1933 | 1 | 6 | 6 | 13 | |
| Jatropha gossypiifolia L. var. elegans (Pohl) Müll-Arg. | Euphorbiaceae | Ornamental | Naturalised | 1955 | 1 | 1 | 2 | | |
| Kalanchoe pinnata (Lam.) Pers. | Crassulaceae | Ornamental | Naturalised | 1938 | 1 | 1 | 2 | | |
| Lactuca serriola L. | Asteraceae | Unintentional | Naturalised | 1977 | 2 | 2 | | | |
| Lantana camara L. | Verbenaceae | Ornamental | Invasive | 1937 | 12 | 14 | 4 | 30 | |
| Lantana trifolia L. | Verbenaceae | Ornamental | Casual | 1905 | 2 | 5 | 7 | 14 | |
| Laphangium luteoalbum (L.) Tzvel cv | Asteraceae | Unintentional | Invasive | 1928 | 1 | 2 | 3 | | |
| Leontodon saxatilis Lam. | Asteraceae | Unintentional | Casual | 1951 | 1 | 1 | | | |
| Lepidium bonariense L. | Brassicaceae | Food | Casual | 1953 | 3 | 8 | | 11 | |
| Lepidium didymum L. | Brassicaceae | Food | Naturalised | 1953 | 3 | 5 | | 8 | |
| Leucaena leucocephala (Lam.) de Wit | Fabaceae | Fodder | Casual | 1949 | 1 | 1 | | | |
| Ligustrum lucidum W.T. Aiton | Oleaceae | Ornamental | Naturalised | 1933 | 1 | 2 | 4 | 7 | |
| Ligustrum spp. | Oleaceae | Ornamental | Naturalised | 1962 | 1 | 1 | | | |
| Lilium formosanum Wallace | Liliaceae | Ornamental | Naturalised | 1961 | 5 | 5 | | | |
| Species                    | Family            | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|----------------------------|-------------------|--------------------------|----------------|---------------------------|-------|------------|------------|--------|--------------------------|
| Linum usitatissimum L.     | Linaceae          | Unintentional            | Casual         | 1949                      | 1     | 1          |            |        | 1                        |
| Lolium multiflorum × perenne | Poaceae          | Fodder                  | Casual         | 1948                      | 2     | 1          | 3          |        |                          |
| Lolium multiflorum Lam.    | Poaceae          | Fodder                  | Casual         | 1967                      | 2     | 2          |            |        |                          |
| Lolium perenne L.          | Poaceae          | Fodder                  | Casual         | 1957                      | 2     | 5          | 5          |        |                          |
| Lolium temulentum L.       | Poaceae          | Fodder                  | Casual         | 1921                      | 4     | 1          | 5          |        |                          |
| Lupinus mexicanus Cerv.    | Fabaceae         | Unintentional            | Naturalised    | 1963                      | 2     | 2          |            |        |                          |
| Macroptilium atropurpureum (DC.) Urb. | Fabaceae | Fodder                  | Naturalised    | 1961                      | 6     | 6          |            |        |                          |
| Malva neglecta Wallr.      | Malvaceae        | Unintentional            | Casual         | 1959                      | 1     | 1          |            |        | 1                        |
| Malva parviflora L. var.   | Malvaceae        | Unintentional            | Casual         | 1921                      | 1     | 4          | 5          |        |                          |
| Malva parviflora           | Malvaceae        | Unintentional            | Casual         | 1955                      | 1     | 3          | 4          |        |                          |
| Malva sylvestris L.        | Malvaceae        | Unintentional            | Casual         | 1940                      | 1     | 4          | 5          |        |                          |
| Malvastrum cordomandelium (L.) Garcke | Malvaceae | Unintentional            | Invasive       | 1945                      | 3     | 4          | 7          |        |                          |
| Mangifera indica L.        | Anacardiaceae    | Food                     | Casual         | 1959                      | 2     | 2          |            |        | 2                        |
| Medicago orbicularis (L.) Bartal. | Fabaceae      | Fodder                  | Casual         | 1962                      | 1     | 1          |            |        | 1                        |
| Medicago polymorpha L. var. brevispica (Benth.) Heyn | Fabaceae | Fodder                  | Casual         | 1910                      | 7     | 2          | 1          |        | 10                       |
| Medicago polymorpha L. var. polymorpha | Fabaceae | Fodder                  | Casual         | 1957                      | 1     | 1          | 2          |        |                          |
| Melia azedarach L.         | Meliaceae        | Ornamental, Invasive     | Timber         | 1903                      | 4     | 5          | 4          |        | 14                       |
| Melilotus albus Medik.      | Fabaceae         | Fodder                  | Naturalised    | 1931                      | 1     | 1          | 2          | 4      |                          |
| Melilotus indicus (L.) All. | Fabaceae         | Fodder                  | Casual         | 1926                      | 4     | 2          |            |        | 6                        |
| Microlepis stri-gosa (Thunb.) K. Presl | Dennstaedtiaceae | Ornamental              | Casual         | 1951                      | 1     | 1          |            |        |                          |
| Microsorum scandens (G. Forst.) Tindale | Polypodiaceae | Ornamental              | Casual         | 1954                      | 1     | 1          |            |        | 1                        |
| Mimosa pudica L.           | Fabaceae         | Unintentional            | Naturalised    | 1918                      | 2     | 1          | 3          |        |                          |
| Mina lobata Cerv.           | Convolvulaceae   | Unintentional            | Casual         | 1919                      | 1     | 1          | 1          |        | 3                        |
| Mirabilis jalapa L.        | Nyctaginaceae    | Unintentional            | Naturalised    | 1933                      | 1     | 4          | 3          |        | 8                        |
| Montanoa hibiscifolia (Benth.) Standl. | Asteraceae     | Ornamental              | Naturalised    | 1946                      | 3     | 1          | 4          |        |                          |
| Moringa oleifera Lam.      | Moringaceae      | Food                     | Casual         | 1943                      | 8     | 4          | 1          | 4      | 13                       |
| Species                      | Family       | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 | Total herbarium specimens |
|------------------------------|--------------|--------------------------|----------------|---------------------------|--------|------------|------------|------|--------------------------|
| Morus australis              | Moraceae     | Food, ornamental         | Naturalised    | 1926                      | 2      | 2          | 5          | 9    |                          |
| Myriophyllum aquaticum (Vell.) Verdc. | Haloragaceae | Ornamental               | Invasive       | 1970                      | 10     |            |            |      |                          |
| Myriophyllum spicatum L.     | Haloragaceae | Ornamental               | Casual         | 1949                      | 1      |            |            | 1    |                          |
| Nasturtium officinale W.T. Aiton | Brassicaceae | Unintentional           | Naturalised    | 1934                      | 1      | 1          | 1          | 3    |                          |
| Nicandra physalodes (L.) Gaertn. | Solanaceae | Ornamental               | Invasive       | 1917                      | 9      | 9          | 12         | 1    | 31                       |
| Nicotiana glauca Graham     | Solanaceae   | Ornamental               | Naturalised    | 1944                      | 13     | 7          | 1          | 21   |                          |
| Nicotiana rustica L.        | Solanaceae   | Ornamental               | Naturalised    | 1950                      | 1      | 1          |            | 2    |                          |
| Nicotiana tabacum L.        | Solanaceae   | Crop, medicinal, ornamental | Naturalised   | 1870                      | 1      | 1          |            | 2    |                          |
| Nierembergia hippomanica Miers var. violacea Millán | Solanaceae | Ornamental               | Casual         | 1973                      | 1      |            |            | 1    |                          |
| Oenothera inedocora Cambess. | Onagraceae   | Ornamental               | Naturalised    | 1953                      | 2      | 7          |            | 9    |                          |
| Oenothera lacinia Hill       | Onagraceae   | Ornamental               | Casual         | 1935                      | 1      |            |            | 1    |                          |
| Oenothera rosea L'Hér, ex Aiton | Onagraceae | Ornamental               | Invasive       | 1919                      | 1      | 11         | 9          | 21   |                          |
| Oenothera stricta Ledeb. ex Link | Onagraceae | Ornamental               | Naturalised    | 1919                      | 1      | 3          | 3          | 7    |                          |
| Oenothera tetrapea Cav.      | Onagraceae   | Ornamental               | Naturalised    | 1949                      | 6      | 4          |            | 10   |                          |
| Opuntia ficus-indica (L.) P. Mill. | Cactaceae | Food, Ornamental        | Invasive       | 1959                      | 2      | 1          |            | 3    |                          |
| Oryza sativa L.              | Poaceae      | Food                     | Casual         | 1966                      | 2      |            |            | 2    |                          |
| Oxalis corniculata L.        | Oxalidaceae  | Unintentional            | Naturalised    | 1972                      | 1      |            |            | 1    |                          |
| Oxalis latifolia Kunth       | Oxalidaceae  | Unintentional            | Invasive       | 1937                      | 6      | 3          |            | 9    |                          |
| Panicum trichoides Sw.       | Poaceae      | Fodder                   | Casual         | 1972                      | 1      |            |            | 1    |                          |
| Parkinsonia aculeata L.      | Fabaceae     | Ornamental               | Naturalised    | 1950                      | 1      | 3          |            | 4    |                          |
| Parthenium hysterophorus L.  | Asteraceae   | Unintentional            | Invasive       | 1982                      | 2      |            |            | 2    |                          |
| Paspalum dilatatum Poir.     | Poaceae      | Fodder                   | Casual         | 1919                      | 3      | 2          | 9          | 14   |                          |
| Paspalum distichum L.        | Poaceae      | Fodder                   | Casual         | 1960                      | 1      | 4          | 1          | 6    |                          |
| Paspalum notatum Flüggé      | Poaceae      | Fodder                   | Naturalised    | 1965                      | 1      |            |            | 1    |                          |
| Paspalum urvillei Steud.     | Poaceae      | Unintentional            | Naturalised    | 1919                      | 2      | 2          | 13         | 17   |                          |
| Passiflora edulis Sims       | Passifloraceae | Food                     | Invasive       | 1944                      | 2      | 1          |            | 3    |                          |
| Species | Family | Reasons for introduction | Current status | Earliest herbarium record | < 1934 | 1935-1960 | 1961-1986 | 1987+ | Total herbarium specimens |
|---------|--------|--------------------------|----------------|---------------------------|--------|------------|------------|------|--------------------------|
| Passiflora ligularis Juss. | Passifloraceae | Unintentional | Casual | 1947 | 5 | | | | 5 |
| Passiflora subpelata Ortega | Passifloraceae | Ornamental | Naturalised | 1971 | 3 | | | | 3 |
| Passiflora tarmoriniana Coppelens & V.E. Barney | Passifloraceae | Ornamental | Casual | 1976 | 1 | | | | 1 |
| Passiflora tripartita var. mollissima (Kunth) Holm-Niels. & P.M. Jørg. | Passifloraceae | Food | Naturalised | 1920 | 1 | 1 | 2 | 1 | 5 |
| Pennisetum clandestinum Hochst. ex Chiov. | Poaceae | Ornamental | Naturalised | 1921 | 1 | 2 | 4 | | 7 |
| Pennisetum glaucum (L.) R.Br. | Poaceae | Food | Casual | 1920 | 3 | 1 | 5 | | 9 |
| Pennisetum setaceum (Forssk.) Chiov. | Poaceae | Ornamental | Naturalised | 1960 | 1 | 5 | 1 | | 7 |
| Pereskia aculeata P. Mill. | Cactaceae | Ornamental | Casual | 1942 | 5 | 2 | | | 7 |
| Persicaria capitata (Buch.-Ham. ex D. Don) H. Gross | Polygonaceae | Ornamental | Invasive | 1959 | 1 | 4 | | | 5 |
| Persicaria lapathifolia (L.) Gray | Polygonaceae | Unintentional | Invasive | 1919 | 1 | 14 | 14 | | 29 |
| Persicaria limbata (Meisn.) H. Hara | Polygonaceae | Unintentional | Invasive | 1931 | 3 | 8 | 27 | | 38 |
| Phalaris arundinacea L. | Poaceae | Fodder | Casual | 1955 | 1 | 2 | | | 3 |
| Phalaris minor Retz. | Poaceae | Unintentional | Casual | 1925 | 1 | 4 | 5 | | 10 |
| Phyllanthus fraternus G.L. Webster | Phyllanthaceae | Unintentional | Naturalised | 1964 | 1 | | | | 1 |
| Physalis angulata L. | Solanaceae | Unintentional | Naturalised | 1947 | 1 | 4 | | | 5 |
| Physalis lagenacea Roemer & J.A. Schultes | Solanaceae | Unintentional | Casual | 1958 | 2 | 2 | | | 4 |
| Physalis peruviana L. | Solanaceae | Food | Naturalised | 1906 | 2 | 2 | 3 | | 7 |
| Physalis philadelphica Lam. | Solanaceae | Food | Casual | 1942 | 3 | | | | 3 |
| Physalis philadelphica var. immaculata Waterf. | Solanaceae | Unintentional | Naturalised | 1922 | 3 | 4 | 2 | | 9 |
| Phytophila octandra L. | Phytolocaceae | Ornamental | Naturalised | 1956 | 1 | | | | 1 |
| Pinus elliottii Engelm. | Pinaceae | Ornamental, timber | Casual | 1923 | 2 | 4 | 2 | | 8 |
Species | Family | Reasons for introduction | Current status | Earliest herbarium record | < 1934 | 1935-1960 | 1961-1986 | 1987+ | Total herbarium specimens
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Pinus patula Schiede ex Schltdl. & Cham. | Pinaceae | Ornamental, timber | Invasive | 1902 | 1 | 6 | 4 | 11
Pinus roxburghii Sarg. | Pinaceae | Ornamental, timber | Invasive | 1902 | 1 | 1 | 2
Pistia stratiotes L. | Araceae | Ornamental | Invasive | 1948 | 4 | 7 | 11
Plantago lanceolata L. | Plantaginaceae | Unintentional | Naturalised | 1921 | 1 | 4 | 1 | 6
Plantago major L. | Plantaginaceae | Unintentional | Naturalised | 1942 | 2 | 3 | 5
Plantago palmata Hook. F. | Plantaginaceae | Unintentional | Casual | 1920 | 1 | 2 | 3
Plectranthus comosus Andrews | Lamiaceae | Ornamental | Naturalised | 1966 | 2 | 2
Poa annua L. | Poaceae | Unintentional | Naturalised | 1934 | 1 | 5 | 10 | 16
Polyg茅nium aviculare L. | Polygonaceae | Unintentional | Naturalised | 1919 | 1 | 2 | 2 | 5
Polypogon monspeliensis (L.) Desf. | Poaceae | Fodder | Casual | 1968 | 1 | 1
Polypogon viridis (Gouan) Breistr. | Poaceae | Fodder | Casual | 1948 | 1 | 1
Pontederia cordata L. var. lanceolata (Nutt.) Griseb. | Pontederiaceae | Ornamental | Naturalised | 1975 | 1 | 1
Populus x canescens (Ait.) Smith | Salicaceae | Unintentional | Invasive | 1947 | 1 | 3 | 4
Portulaca oleracea L. | Portulacaceae | Food | Naturalised | 1975 | 1 | 1
Primula malacoides Hort. | Primulaceae | Ornamental | Naturalised | 1972 | 2 | 2
Prosopis spp. | Fabaceae | Unintentional | Naturalised | 1974 | 1 | 1
Prunus cerasoïdes D. Don | Rosaceae | Ornamental | Invasive | 1950 | 1 | 6 | 7
Prunus serotina Ehrh. var. salicifolia (Kunth.) Koene | Rosaceae | Ornamental | Casual | 1944 | 3 | 2 | 5
Psidium cattleyanum Afzel. ex Sabine | Myrtaceae | Food, ornamental | Casual | 1961 | 1 | 1
Psidium guajava L. | Myrtaceae | Food, ornamental | Invasive | 1951 | 4 | 6 | 10
Punica granatum L. | Lythraceae | Ornamental | Casual | 1931 | 1 | 1
Ranunculus sceleratus L. | Ranunculaceae | Unintentional | Casual | 1965 | 3 | 3
Raphanus raphanistrum L. | Brassicaceae | Food | Casual | 1919 | 1 | 1 | 2
Raphanus sativus L. | Brassicaceae | Food | Casual | 1918 | 1 | 1 | 1 | 3
Rapistrum rugosum (L.) All. | Brassicaceae | Unintentional | Naturalised | 1958 | 1 | 1
Reseda odorata L. | Resedaceae | Ornamental | Casual | 1957 | 1 | 1 | 2
| Species                    | Family        | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|----------------------------|---------------|---------------------------|----------------|---------------------------|--------|-----------|-----------|--------|---------------------------|
| Richardia brasiliensis Gomes | Rubiaceae     | Unintentional             | Invasive       | 1919                      | 5      | 11        | 7         | 23     |                           |
| Richardia scabra L.         | Rubiaceae     | Unintentional             | Invasive       | 1944                      | 4      | 9         |           | 13     |                           |
| Ricinus communis L.         | Euphorbiaceae | Ornamental                | Invasive       | 1944                      | 3      | 5         | 1         | 9      |                           |
| Rivina humilis L.           | Phytolaccaceae| Ornamental               | Naturalised    | 1962                      | 1      |           | 1         |        |                           |
| Rubus niveus Thunb.          | Rosaceae      | Unintentional             | Invasive       | 1961                      | 6      | 6         |           |        |                           |
| Rumex acetosella L.         | Polygonaceae  | Unintentional             | Naturalised    | 1935                      | 9      | 3         |           | 12     |                           |
| Rumex crispus L. subsp. pulcher | Polygonaceae | Unintentional         | Naturalised    | 1931                      | 1      | 4         | 4         | 9      |                           |
| Rumex pulcher L. subsp. pulcher | Polygonaceae | Unintentional               | Naturalised    | 1973                      | 1      | 1         |           | 11     |                           |
| Sacciolepis interrupta (Willd.) Staff | Poaceae | Unintentional             | Casual         | 1969                      | 6      | 6         |           |        |                           |
| Sagina apetala Ard.         | Caryophyllaceae| Unintentional            | Casual         | 1959                      | 1      | 3         | 4         |        |                           |
| Salix babylonica L.         | Salicaceae    | Ornamental                | Naturalised    | 1965                      | 2      | 2         |           |        |                           |
| Salvia coccinea              | Lamiaceae     | Ornamental               | Naturalised    | 1917                      | 2      | 4         | 6         | 12     |                           |
| Salvia nilotica             | Lamiaceae     | Unintentional             | Casual         | 1917                      | 5      | 9         | 7         | 21     |                           |
| Salvia reflexa              | Lamiaceae     | Unintentional             | Casual         | 1955                      | 1      | 1         | 2         |        |                           |
| Salvinia molesta Mitchell   | Salviniaceae  | Ornamental               | Invasive       | 1952                      | 10     | 4         | 3         | 17     |                           |
| Sambucus nigra subsp. canadensis (L.) R. Bolli | Adoxaceae | Ornamental             | Casual         | 1965                      | 1      | 3         | 1         |        |                           |
| Santolina cha-maecyparissus L. | Asteraceae | Ornamental               | Casual         | 1955                      | 1      | 2         | 3         |        |                           |
| Schizolobium paralyba (Vell.) S.F.Blake | Fabaceae   | Ornamental               | Casual         | 1965                      | 3      | 3         |           |        |                           |
| Schkuhria pinnata (Lam.) Kunzte ex Thell. | Asteraceae | Unintentional             | Invasive       | 1918                      | 3      | 15        | 13        | 3      | 34                        |
| Senecio vulgaris L.          | Asteraceae    | Unintentional             | Naturalised    | 1970                      | 1      |           | 1         |        |                           |
| Senna bicapsularis (L.) Roxb. | Fabaceae     | Ornamental               | Naturalised    | 1959                      | 1      | 5         | 1         | 7      |                           |
| Senna didymobotrya (Fresen.) H.S.Irwin & Barneby | Fabaceae | Ornamental               | Invasive       | 1921                      | 3      | 8         | 6         | 17     |                           |
| Senna hirsuta (L.)           | Fabaceae      | Ornamental               | Casual         | 1962                      | 1      |           | 1         |        |                           |
| Senna obtusifolia (L.) H.S.Irwin & Barneby | Fabaceae | Ornamental               | Naturalised    | 1932                      | 2      | 14        | 15        | 2      | 33                        |
| Senna occidentalis (L) Link  | Fabaceae      | Ornamental               | Invasive       | 1912                      | 4      | 12        | 13        | 29     |                           |
| Species                     | Family          | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 | Total herbarium specimens |
|-----------------------------|-----------------|--------------------------|----------------|---------------------------|-------|-----------|-----------|-----|--------------------------|
| *Senna septemtrionalis* (Viv.) | Fabaceae        | Ornamental               | Naturalised    | 1906                      | 4     | 10        | 9         | 23  |                          |
| *Senna siamea* (Lam.) H.S. Irwin & Barneby | Fabaceae        | Ornamental               | Casual         | 1971                      | 1     | 1         |           |     |                          |
| *Sesbania punicca* (Cav.) Benth. | Fabaceae        | Fodder                   | Naturalised    | 1908                      | 6     | 19        | 14        | 1   | 40                       |
| *Setaria italica* (L.) P.Beauv. | Poaceae         | Food                     | Casual         | 1912                      | 1     | 3         | 1         | 5   |                          |
| *Sherardia arvensis* L. | Rubiaceae       | Unintentional            | Casual         | 1964                      | 1     | 1         |           |     |                          |
| *Sida cordifolia* subsp. maculata (Cav.) Marais | Malvaceae       | Fibre                    | Invasive       | 1904                      | 5     | 23        | 9         | 37  |                          |
| *Silene armeria* L. | Caryophyllaceae | Ornamental               | Casual         | 1957                      | 1     | 1         |           |     |                          |
| *Silene gallica* L. | Caryophyllaceae | Unintentional            | Casual         | 1910                      | 4     | 2         | 1         | 7   |                          |
| *Sinapis arvensis* L. | Brassicaceae    | Unintentional            | Naturalised    | 1915                      | 1     | 1         | 1         | 3   |                          |
| *Sisymbrium orientale* L. | Brassicaceae    | Unintentional            | Naturalised    | 1956                      | 1     | 1         |           |     |                          |
| *Solanum americanum* Mill. | Solanaceae      | Unintentional            | Casual         | 1955                      | 1     | 1         |           |     |                          |
| *Solanum betaceum* Cav. | Solanaceae      | Ornamental               | Naturalised    | 1976                      | 1     | 1         |           |     |                          |
| *Solanum lycopersicum* L. | Solanaceae      | Food                     | Casual         | 1958                      | 1     | 1         |           |     |                          |
| *Solanum mauritianum* Scop. | Solanaceae      | Unintentional            | Invasive       | 1976                      | 1     | 1         |           |     |                          |
| *Solanum seaforthianum* Andrews | Solanaceae      | Ornamental               | Invasive       | 1918                      | 1     | 5         | 10        | 16  |                          |
| *Sonchus asper* (L.) Hill | Asteraceae      | Unintentional            | Invasive       | 1917                      | 8     | 10        | 19        | 37  |                          |
| *Sorghum bicolor* (L.) Moench ssp. drummondii (Steud.) deWet | Poaceae         | Food                     | Casual         | 1920                      | 3     | 7         | 3         | 13  |                          |
| *Sorghum halepense* (L.) Pers. | Poaceae         | Food                     | Casual         | 1920                      | 1     | 4         | 10        | 15  |                          |
| *SPATHODIA campanulata* P. Beauv. | Bignoniaceae    | Ornamental               | Casual         | 1977                      | 1     | 1         | 1         | 2   |                          |
| *Spergula arvensis* L. | Caryophyllaceae | Unintentional            | Casual         | 1944                      | 1     | 2         | 1         | 3   |                          |
| *Sphagnetica trifolata* (L.) Pruski | Asteraceae      | Unintentional            | Naturalised    | 1976                      | 2     | 2         |           |     |                          |
| *Stachytarpheta cayennensis* (Rich.) Vahl | Verbenaceae     | Ornamental               | Casual         | 1977                      | 1     | 1         |           |     |                          |
| *Stellaria media* (L.) Vill. | Caryophyllaceae | Unintentional            | Naturalised    | 1919                      | 1     | 5         | 5         | 11  |                          |
| Species | Family | Reasons for introduction | Current status | Earliest herbarium record | <1934 | 1935-1960 | 1961-1986 | 1987 > | Total herbarium specimens |
|---------|--------|--------------------------|---------------|--------------------------|--------|------------|------------|--------|--------------------------|
| Symphyotrichum subulatum (Michx.) G.L. Nesom var. squamatum (Spreng.) S.D. Sundh. | Asteraceae | NA | Casual | 1958 | 4 | 1 | 5 | |
| Syzygium cumini (L.) Skeels | Myrtaceae | Food | Casual | 1949 | 3 | 4 | 7 | |
| Syzygium jambos (L.) Alston | Myrtaceae | Food | Naturalised | 1953 | 1 | 3 | 4 | |
| Tagetes erecta L. | Asteraceae | Ornamental | Naturalised | 1969 | 1 | 1 | 1 | |
| Tagetes minuta L. | Asteraceae | Unintentional | Invasive | 1917 | 2 | 9 | 16 | 1 | 28 |
| Taraxacum croceum Dahlst. | Asteraceae | Unintentional | Naturalised | 1943 | 1 | 7 | 8 | |
| Tecoma stans (L.) Juss. ex Kunth | Bignoniaceae | Ornamental | Casual | 1981 | 1 | 1 | 1 | |
| Tephrosia vogelii Hook.f. | Fabaceae | Unintentional | Naturalised | 1919 | 2 | 7 | 4 | 13 | |
| Tipuana tipu (Benth.) Kuntze | Fabaceae | Ornamental | Casual | 1967 | 1 | 1 | 1 | |
| Tithonia diversifolia (Hems.) A. Gray | Asteraceae | Ornamental | Naturalised | 1944 | 4 | 2 | 6 | |
| Tithonia rotundifolia (Mill.) S.F. Blake | Asteraceae | Ornamental | Invasive | 1944 | 3 | 7 | 10 | |
| Toona ciliata M. Roem. | Meliaceae | Ornamental, Invasive | timber | 1903 | 4 | 3 | 3 | 10 | |
| Tridax procumbens L. | Asteraceae | Unintentional | Naturalised | 1948 | 5 | 12 | 17 | |
| Trifolium campestre Schreb. | Fabaceae | Unintentional | Casual | 1959 | 1 | 1 | 2 | |
| Trifolium dubium Sibth. | Fabaceae | Unintentional | Naturalised | 1931 | 2 | 1 | 1 | 4 | |
| Trifolium repens L. | Fabaceae | Unintentional | Naturalised | 1931 | 4 | 1 | 5 | 10 | |
| Verbena bonariensis L. | Verbenaceae | Ornamental | Naturalised | 1924 | 1 | 1 | 2 | 1 | 5 | |
| Verbena brasiiliensis Vell. | Verbenaceae | Unintentional | Casual | 1931 | 2 | 14 | 14 | 30 | |
| Verbena litoralis Kunth | Verbenaceae | Unintentional | Casual | 1958 | 1 | 1 | 2 | |
| Verbena rigida Spreng. | Verbenaceae | Unintentional | Casual | 1974 | 3 | 3 | 3 | |
| Verbesina enceloides (Cav.) A. Gray | Asteraceae | Unintentional | Naturalised | 1959 | 2 | 1 | 3 | |
| Vernonanthura polyanthae (Spreng.) A.J. Vega & Dematt. | Asteraceae | Unintentional | Invasive | 2016 | 6 | 6 | |
| Veronica persica Poir. | Plantaginaceae | Unintentional | Casual | 1959 | 1 | 1 | 1 | |
| Vicia sativa L. var. angustifolia L. | Fabaceae | Fodder | Naturalised | 1926 | 2 | 6 | 3 | 11 | |
| Vicia villosa subsp. villosa | Fabaceae | Unintentional | Casual | 1955 | 6 | 1 | 7 | |
(continued)

| Species                                       | Family               | Reasons for introduction | Current status | Earliest herbarium record | 1934 | 1935-1960 | 1961-1986 | 1987+ | Total herbarium specimens |
|-----------------------------------------------|----------------------|--------------------------|----------------|----------------------------|-------|------------|------------|------|--------------------------|
| Wigandia urens (Ruiz & Pavon) var. caracasana (Kunth) D. N. Gibson | Hydrocharitaceae     | Ornamental               | Naturalised    | 1928                       | 1     | 4          | 2          | 7    |                           |
| Wigandia urens var. caracasana (Kunth) D. Gibson      | Boraginaceae         | Ornamental               | Casual         | 1965                       |       | 1          |            | 1    |                           |
| Xanthium spinosum L.                               | Asteraceae           | Unintentional            | Invasive       | 1906                       | 3     | 4          | 3          | 10   |                           |
| Xanthium strumarium L.                             | Asteraceae           | Unintentional            | Invasive       | 1942                       | 7     | 6          |            | 13   |                           |
| Zephyranthes minutia (Kunth) D.Dietr.               | Amaryllidaceae       | Ornamental               | Casual         | 1933                       | 1     | 4          |            | 5    |                           |
| Zinnia peruviana (L.) L.                            | Asteraceae           | Unintentional            | Naturalised    | 1943                       | 2     | 7          |            | 9    |                           |
| Ziziphus mauritiana Lam.                           | Rhamnaceae           | Food                     | Naturalised    | 1950                       | 2     | 2          |            | 4    |                           |

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