

Bird seed aliens in Britain

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ABSTRACT

The petfood industry imports large quantities of seed into Britain as food for cage birds. This ultimately results in the appearance of many species of plants growing in Britain as casuals on rubbish tips or waste ground and in gardens. Some 30 species of plants are regularly introduced as bird food and these, together with their impurities, regularly appear as bird seed aliens. These plants originate widely from many countries around the world. Cultivation of bird seed samples from many sources and the records of plants occurring as bird seed aliens have produced a list of 438 species of plants believed to be introduced by this agency.

INTRODUCTION

Alien plants may be introduced deliberately or accidentally into Britain by the activities of man. Lousley (1953) listed agencies by which foreign cultivated plants and weeds may be introduced into this country. He pointed out that it is useful to distinguish (a) those plants which are brought in deliberately and (b) those which come in accidentally. In the category (b) are a number of groups of alien weeds that have received a good deal of attention from botanists in the past. Wool aliens, for example, were studied by Hayward & Druce (1919) and Lousley (1961) and many others. Dock aliens introduced with ballast were studied by Sandwith (1933) and others.

The import of foreign seed as foodstuffs for domestic and cage birds is a major source of introduction of aliens which has received little attention or detailed study. A large proportion of the foreign plants that appear as casuals on town rubbish tips every summer originate from bird cage waste in domestic rubbish. There are a number of other situations in which bird seed plants may appear as casuals. Mixtures sold as wild bird food are often scattered in gardens or on waste ground where some of the seeds germinate. There are also rare instances where waste from importers of grain is dumped or spilled on waste land where some of the seeds may grow.

Müller (1950) listed plants introduced into Germany with bird seed in the only comprehensive paper on the subject to date. Hovda (1978) published a list of plants cultivated from bird seed in Oslo. There are a number of more popular accounts in the British literature that will be of interest to students of bird seed aliens. McClintock (1967, 1972) gave short accounts of the more familiar bird seed plants. Mason (1971) described species introduced into gardens with bird food mixtures. Mason (1973–76) gave guidance on the identification of some of the most frequent bird seed aliens in a series of illustrated articles. Watts & Watts (1979) made a painstaking analysis of the composition of commercial bird seed mixtures and related it to the occurrence of weeds on a Norwich rubbish tip.

The present paper attempts to give a brief account of the bird seed industry and the part it plays in bringing alien plants into this country. It also presents the results of the authors' work on cultivating plants from commercial bird food mixtures, in the form of a definitive list of species that may be introduced into Britain by this agency.

BIRD FOOD PLANTS

There are about 30 different plants whose seed is imported into Britain as bird food. The seed is fed to a variety of different types of domestic and cage birds such as chickens, pigeons, parrots, budgerigars and canaries. Mixtures of commercial seed for these birds vary from one producer to another but the basic ingredients are usually the same. Many of the plants imported as seed in this way are grown in warmer countries for local consumption. Only a small proportion of the total production is used as bird food. Some of the plants yield a variety of products, such as Hemp, *Cannabis sativa*, which is grown to produce fibre and narcotic resin in addition to the seeds. Few of the plants are grown purely as bird food but Canary Grass, *Phalaris canariensis*, is a good example of a plant which is rarely grown for human consumption and is primarily produced as a bird food.

Cereal grasses account for the majority of bird foods and are currently imported in tens of thousands of tonnes per annum. *P. canariensis* and the various millets (species of *Panicum*, *Setaria* and *Echinochloa*) are the principal imports. *P. canariensis* is imported from a number of producing countries among which Morocco and Argentina are the most important. It is also grown in Greece, Turkey, Spain, Australia, Canada, the U.S.A., Holland and England. Yields in this country are low compared with cash crops such as Barley so it is hardly grown here commercially. Millets include the seeds of several different species of plant that are sold under trade names which give little clue about the nature of the actual plant in some cases. Broomcorn Millet, *Panicum miliaceum*, is widely grown as a food crop for man and his livestock, especially in Asia. A number of colour varieties are imported from America such as 'Red Dakota' and 'White Colorado' from the U.S.A. and 'Plate Yellow' from Argentina. Italian or Foxtail Millet, *Setaria italica*, is widely grown and commonly used for human food, but also for fodder and for brewing beer. This plant is sold as intact ears in the form of millet sprays for budgerigars and is imported from Italy, France and China in this form. The loose grain is sold under the misleading trade name 'Panicum Millet' and is imported from the U.S.A., S. Africa, Australia, China and France. A proportion of the millet imported is Japanese Millet, *Echinochloa utilis*, which originates from Australia, S. Africa and the U.S.A.

Rice, *Oryza sativa*, is also used as a bird food under the name 'Paddy Rice' and is imported from Italy and Argentina. Other less exotic cereals of temperate countries such as Maize, *Zea mays*, Barley, *Hordeum distichon* and *H. vulgare*, Wheat, *Triticum aestivum*, and possibly Rye, *Secale cereale*, are also used in bird foods. A number of other species are also imported as bird foods, especially members of the Compositae. Sunflower, *Helianthus annuus*, which is used for parrots, is imported from the East African countries Kenya, Uganda and Tanzania. Another composite, *Guizotia abyssinica*, yields the black seeds of Niger which are imported from Ethiopia and India. The large thistle-like Safflower, *Carthamus tinctorius*, produces oily seeds that are introduced from India, the U.S.A. and Australia. *Cannabis sativa* is another plant of warmer climates which produces useful oily seeds. This is another common ingredient of bird food mixtures and is imported from such countries as Turkey and China.

A number of plants grown in Europe are imported as bird food, including Teazel, *Dipsacus sativus*, (which is soaked and used for rearing young birds); Gold of Pleasure, *Camelina sativa*; Buckwheat, *Fagopyrum esculentum*; 'Linseed', *Linum usitatissimum*, from Holland; the aromatic umbellifer Cumin, *Cuminum cyminum* (a tonic seed), from Cyprus and elsewhere; and Sweet Pepper, *Capsicum annum*, from Spain.

From this brief review it will be clear that bird food is imported from a wide variety of sources and that only a small proportion of the production of these plants is exported to Britain as bird food. The actual sources of seed may vary from one year to the next depending on the success of the harvest in the producing countries and how this influences the price on the world market. Other factors such as local needs may also have some bearing on the amount exported by certain countries.

Most of the really frequent bird seed aliens belong to this group of intentionally imported plants. In the list which follows this account, the common commercial names of seeds used as bird food are given together with their appropriate scientific names. The majority of these plants will grow readily in Britain and frequently appear as casuals on waste ground, rubbish tips, etc. A few of them virtually never appear here because they are imported in very small quantity or they have little chance of finding suitable conditions for germination. For example Groundnut, *Arachis hypogaea*, and *Cuminum cyminum* are rare as casual plants, while the authors have never seen *Oryza sativa* growing wild in Britain.

THE BIRD FOOD INDUSTRY

The processes involved in the preparation of commercial bird seed were described by Byles (1968), who gave some background information about the bird food industry. The various seeds first arrive in this country from foreign sources in sacks which contain a large proportion of unwanted material such as husks, stalks, straw, soil, stones, fragments of insects, pieces of newspaper and other rubbish. The imported seed also includes foreign seeds of the weeds which were harvested with the crop. The condition of seed on arrival depends on the type of crop and the country of origin. *Phalaris canariensis* seed arriving from Morocco, for example, is spectacularly impure with a great quantity of foreign seed. The seed is cleaned first by sieving to remove stones, soil and some foreign matter, and by blowing to remove dust and chaff. The seed is then sorted using a revolving drum which is lined with indentations the size and shape of the desired seed. The drum picks up only seeds of the appropriate dimensions. This results in a fairly pure seed supply which is then polished clean. The few foreign seeds that escape the cleaning process are those that resemble the main seed most closely in size and shape. If commercial packets of budgerigar seed are carefully sorted they reveal a few foreign seeds of plants such as *Lolium temulentum*, *Setaria pumila*, *Hainardia cylindrica* and *Centaurea diluta*, which closely resemble *Phalaris canariensis* seeds in size.

There are a number of dealers in the U.K. who sell seed as bird food either as pure seed or in a variety of proprietary mixtures such as 'Budgie Mixture', 'Canary Mixture' or 'Parrot Food'. This seed may be very clean and pure or it may contain a fair proportion of foreign matter which has not been adequately removed during the cleaning process. Some mixtures include tonic and other additives to give a balanced diet. Mixtures for garden birds are often produced under the name 'Wild Bird Food': the best known of these is 'Swoop'. These mixtures often consist of some staple food seeds together with a proportion of the cleanings from other commercial seed mixtures. These cleanings include a great variety of weed seeds which are imported as impurities. This is why such bird seed often introduces exotic plants into people's gardens.

The high quality cage bird mixtures are carefully finished products which are intended to look attractive to the buyer. These include Petfoods' 'Trill' and Capern's 'Canary Mixture'. The seed is very pure, with few foreign seeds; the seed types in such a mixture often include colour varieties to improve the appearance and all the grains are free of dust and debris as a result of being polished clean.

FACTORS INFLUENCING ALIENS APPEARING IN BRITAIN

There are a number of factors which influence the bird seed alien plants that may appear growing wild as casuals in Britain. Most of the bird food species themselves are introduced in quantity but, for reasons already discussed, not all of them occur as casual plants. The great variety of other bird seed aliens are provided by the foreign material which is inevitably imported with the bird food itself. Certain products are imported in a more impure state than others. The opportunity to introduce foreign seeds varies with the type of plant, how it is harvested and which country it comes from. Some species can be harvested easily without gathering much foreign material, e.g. *Dipsacus sativus*, *Zea mays* and *Helianthus annuus*, while the low-growing cereals such as the millets cannot be easily separated from the weeds that grow with them. The country of origin of the seed clearly influences the actual species that may be introduced with it. Consequently changes in the main sources of different types of seed in response to a fluctuating world market can result in changes in the aliens commonly occurring in Britain. This probably explains why some weeds make regular appearances for a period of years and then are absent for a number of years.

Certain species pass through the cleaning process more easily than others. There are a number of species whose seeds are introduced into this country in large quantities as impurities, but which are very easily separated from the bird food and which therefore rarely have the opportunity to germinate. These include the very large fruits of plants such as *Scandix pecten-veneris*, *Tragopogon hybridus*, *Xanthium spinosum* and *Cenchrus incertus*. The tiny seeds of species of *Chenopodium* and *Amaranthus* are also relatively easily removed. As explained above, the most regular weeds are those whose seeds closely resemble the main bird food plants.

CULTIVATION OF BIRD SEED

It is difficult to produce a definitive list of bird seed aliens by compiling a list of plants recorded as casuals on rubbish tips and waste ground because the plants that occur in such places may be introduced with a variety of other products in addition to bird seed. A number of the frequent bird seed aliens are widespread or cosmopolitan weeds that are also introduced into Britain with wool, esparto grass and soya beans. In order to eliminate the element of doubt about the origin of weeds the authors carried out a programme of cultivating samples of bird seed in gardens and greenhouses under controlled conditions using sterilized soil. The samples included commercial bird seed mixtures and the cleanings from a variety of different sources that were obtained from the bird seed distributors. Pigeon and chicken foods were excluded.

ANNOTATED LIST OF SPECIES INTRODUCED INTO BRITAIN WITH BIRD FOOD

The following list is based on the cultivation of samples of bird seed and the waste separated from commercial seed carried out by the authors with some additional records contributed by those listed below. The list also includes species recorded on the waste tips between Humberstone and Cleethorpes in N. Lincs., v.c. 54 (now S. Humberside), that received waste from a large petfood distributor. Records are also included from other tips, where there was little doubt that the plants originated from bird seed, and from gardens where bird seed had been distributed. The species imported and sold as bird food are distinguished by the use of block capitals. The remainder are imported as impurities in the main staple crops. The following abbreviations are used in the list:

Cult.	= cultivated by:	
CGH	= C. G. Hanson	
JLM	= J. L. Mason	
FH	= Mrs F. Houseman	
CJJ	= C. J. Jenness	
DNT	= D. N. Turner	
GDW	= Dr G. D. Watts	
Müller	= recorded in Müller's list (Müller 1950)	
Hovda	= recorded in Hovda's list (Hovda 1978)	
Lincs. 1956, etc.	= recorded on tips between Humberstone and Cleethorpes (Gibbons 1975)	
tips	= recorded on other rubbish tips with bird seed aliens*	
gardens	= recorded in gardens in association with other bird seed aliens*	
very frequent	= seen every year in quantity	} authors' assessment of frequency in the wild as casuals of tips, waste ground, etc., with advice from E. J. Clement
frequent	= seen every year	
infrequent	= a few plants seen every year	
occasional	= a few plants seen most years	
sporadic	= single plants appearing irregularly	

The nomenclature and sequence of families follow *Flora Europaea*. The genera and species are listed in alphabetical order within families.

Cannabaceae

CANNABIS SATIVA L. (INDIAN HEMP): Cult. CGH & JLM; Müller; Hovda; Lincs. 1956; tips; frequent. A regular ingredient of bird seed mixtures which is often sold as sterile seed to prevent misuse of the plant as a narcotic drug.

Polygonaceae

Bilderdykia convolvulus (L.) Dumort. (*Polygonum convolvulus* L.): Cult. CGH & JLM; Müller; frequent.

Emex spinosa (L.) Campd.: Cult. CGH & JLM. The seeds are a regular impurity in imported seed but the plant itself is a rare weed.

FAGOPYRUM ESCULENTUM Moench (BUCKWHEAT): Cult. CGH; Müller; Lincs. 1969; tips; frequent. Also used for game rearing.

*held in CGH card index

- F. tataricum* (L.) Gaertner: tips; gardens; sporadic.
Polygonum arenarium subsp. *pulchellum* (Loisel.) D. A. Webb & Chater: Lincs. 1955; tips; sporadic.
P. aviculare L.: Cult. CGH & JLM; Lincs. 1956; very frequent.
P. lapathifolium L.: Cult. CGH; Müller; Lincs. 1956; frequent.
P. nepalense Meissner: Cult. CGH; gardens; sporadic.
P. patulum Bieb.: Müller; Lincs. 1955; tips; sporadic.
P. persicaria L.: Cult. CGH; occasional.
Rumex acetosella L.: Cult. CGH; tips; occasional.
R. brownii Campd.: Cult. CGH. Also not uncommon as a wool alien.
R. crispus L.: Cult. CGH; Müller; infrequent.
R. obovatus Danser: Cult. CGH; tips; gardens; sporadic.
R. pulcher L. subsp. *divaricatus* (L.) Murb.: Cult. CGH; Müller; tips; sporadic.
R. pulcher subsp. *pulcher*: Cult. CGH.
R. triangulivalvis (Danser) Rech.f.: Cult. FH; tips; sporadic.

Chenopodiaceae

- Atriplex hortensis* L.: Cult. CGH; tips; frequent. Also a garden escape.
A. patula L.: Cult. CGH. Also occurs as a common weed.
Beta vulgaris L.: Cult. CGH; Müller. Also occurs as a garden throw-out.
Chenopodium album L.: Cult. CGH & JLM; Müller; very frequent.
C. album subsp. *striatum* (Krašan) J. Murr: Cult. CGH.
C. ambrosioides L.: tips; sporadic.
C. capitatum (L.) Asch.: Cult. FH; tips; sporadic.
C. ficifolium Sm.: Cult. CGH & JLM; Lincs. 1965; tips; frequent.
C. giganteum D. Don: Cult. CGH; Lincs. 1963; tips; gardens; occasional.
C. glaucum L.: Hovda; tips; sporadic.
C. hybridum L.: Cult. CGH; tips; gardens; infrequent.
C. murale L.: Cult. CGH; Lincs. 1953; infrequent.
C. opulifolium Schrader ex Koch & Ziz: Cult. CGH; Müller; Lincs. 1955; occasional.
C. polyspermum L.: Cult. CGH; Hovda; very frequent.
C. probstii Aellen: Cult. CGH & JLM; frequent.
C. rubrum L.: Cult. CGH; very frequent.
C. suecicum J. Murr: Cult. CGH; Hovda.
C. vulvaria L.: Cult. FH; tips; gardens; sporadic.
Salsola kali subsp. *ruthenica* (Iljin) Soó: tips; gardens; sporadic.
Spinacia oleracea L.: Cult. CGH; Müller; tips; occasional.

Amaranthaceae

- Achyranthes aspera* L.: Cult. CGH; tips; sporadic.
Amaranthus × *adulterintus* Thell.: Cult. CGH; tips; sporadic.
A. albus L.: Cult. CGH & JLM; Müller; Hovda; tips; infrequent. Sometimes becomes temporarily established on rubbish tips and waste ground.
A. blitoides S. Watson: Cult. CGH; Lincs. 1955; occasional. A characteristic impurity of seed from the Americas.
A. bouchonii Thell.: tips; sporadic.
A. caudatus L.: Cult. CGH; Müller; tips; occasional.
A. cruentus L.: Cult. CGH; sporadic.
A. cruentus var. *erythrostachys* Moq.: Cult. CGH.
A. graecizans L.: Cult. CGH; gardens; sporadic.
A. hypochondriacus L. (*A. hybridus* L.): Cult. CGH & JLM; infrequent. Common as an impurity in seed imported from the Americas but not so common as a weed.
A. lividus L.: Cult. CJJ; tips; sporadic.
A. muricatus (Moq.) Gillies ex Hicken: tips; gardens; sporadic.
A. paniculatus L.: Müller; gardens; sporadic.

- A. quitensis* Kunth: Cult. CGH; Müller; tips; infrequent. A common impurity in seed imported from the Americas.
A. retroflexus L.: cult. CGH & JLM; Müller; Hovda; Lincs. 1969; infrequent but the seeds are commonly imported from the Americas.
A. scleropoides Uline & Bray: Cult. CGH & CJJ. An endemic of Texas.
A. standleyanus Parodi ex Covas: Cult. CGH; tips; gardens; sporadic.
A. thunbergii Moq.: tips; sporadic.
A. viridis L.: Cult. CJJ; tips; sporadic.
Celosia argentea L.: Cult. CGH.

Tetragoniaceae

- Tetragonia tetragonoides* (Pallas) Kuntze: Cult. CGH; tips; occasional

Portulacaceae

- Portulaca oleracea* L.: Cult. CGH; Müller; tips; gardens; sporadic.

Caryophyllaceae

- Agrostemma githago* L.: Müller; gardens; sporadic. Not uncommon near poultry runs.
Silene alba (Miller) E. H. Krause: Cult. CGH.
S. behen L.: Cult. CGH; tips; gardens; sporadic.
S. dichotoma Ehrh.: Cult. CGH & JLM; Müller; gardens; sporadic.
S. gallica L.: Cult. CGH; Lincs. 1955; sporadic.
S. inaperta L.: Cult. CGH; Lincs. 1964; tips; sporadic.
S. laeta (Aiton) Godron: Cult. CGH.
S. muscipula L.: Müller; Lincs. 1963; sporadic.
S. noctiflora L.: Cult. CGH; Müller; occasional.
S. nocturna L.: Cult. CGH.
S. nutans L.: gardens; sporadic.
S. sedoides Poiret: Lincs. 1955; sporadic.
S. vulgaris (Moench) Garcke: Cult. CGH; Müller; frequent but probably usually occurs as a native weed.
S. vulgaris subsp. *angustifolia* (Miller) Hayek: Cult. CGH.
Stellaria media (L.) Vill.: Cult. CGH. Also occurs as a common weed.
Vaccaria pyramidata Medicus: Cult. CGH & JLM; Müller; Hovda; Lincs. 1956; infrequent. A regular impurity in Moroccan seed; often attracts attention because of its decorative flowers.

Ranunculaceae

- Nigella gallica* Jordan: gardens; sporadic.
Ranunculus arvensis L.: Cult. CGH; Müller.
R. marginatus D'Urv.: Cult. CGH; Lincs. 1956; sporadic.
R. muricatus L.: Cult. CGH; Lincs. 1956; sporadic.

Papaveraceae

- Argemone mexicana* L.: Cult. CGH; tips; sporadic.
Glaucium corniculatum (L.) J. H. Rudolph: Cult. FH.
 [*Papaver atlanticum* (Ball.) Cosson: is claimed to be a bird seed alien in Clapham *et al.* (1962) but the authors have no evidence of its introduction in this way].
P. rhoeas L.: Cult. CGH; Müller; very frequent.
P. SOMNIFERUM L. (BLUE MAW SEED): Cult. CGH & JLM; Müller; Hovda; Lincs. 1956; very frequent. A regular weed also originating from gardens.
P. somniferum L. subsp. *setigerum* (DC.) Corb.: Cult. CGH; Müller; Hovda; Lincs. 1956; sporadic.

Cruciferae

- Barbarea vulgaris* R. Br.: Cult. CGH; occasional.
Brassica carinata A. Br.: Cult. CGH; occasional.
B. juncea (L.) Czern.: Cult. CGH; Hovda; Lincs. 1956; infrequent, but easily overlooked.

- B. napus* L.: Cult. CGH; Hovda; frequent.
B. nigra (L.) Koch: Cult. CGH; Hovda; frequent.
B. oleracea L.: Cult. CGH & JLM; infrequent.
B. RAPA L. (RED & BLACK RAPE): Cult. CGH & JLM; Müller; Hovda; frequent. The seed is sold in two colour varieties.
Bunias orientalis L.: Cult. CGH; occasional.
Camelina microcarpa Andr. ex DC.: is often quoted as a bird seed alien but has not yet been recorded by the authors.
C. SATIVA (L.) Crantz (GOLD OF PLEASURE): Cult. CGH & JLM; Müller; Lincs. 1953; infrequent but sometimes abundant on tips.
Capsella bursa-pastoris (L.) Medicus: Cult. CGH; very frequent.
Conringia orientalis (L.) Dumort.: Cult. CGH; Müller; occasional.
Diplotaxis muralis (L.) DC.: Cult. FH; Hovda; Lincs. 1956; infrequent.
Eruca vesicaria (L.) Cav. (*E. sativa* Mill.): Cult. CGH & JLM; Müller; occasional. Also cultivated and used as a herb or salad plant.
Erucastrum gallicum (Willd.) O. E. Schulz: Cult. CGH; Hovda; sporadic.
Erysimum cheiranthoides L.: Cult. CGH.
Hirschfeldia incana (L.) Lagrèze-Fossat: Cult. CGH; frequent and may become established on waste ground.
Lepidium bonariense L.: gardens; sporadic.
L. densiflorum Schrader: gardens; sporadic.
L. divaricatum Solander: Cult. FH.
L. ruderale L.: Cult. CGH; Lincs. 1963; tips; occasional.
L. sativum L.: Cult. CGH & JLM; Lincs. 1955; frequent.
Lobularia maritima (L.) Desv.: Lincs. 1955; infrequent.
Myagrum perfoliatum L.: Müller; Lincs. 1956; sporadic.
Neslia paniculata (L.) Desv.: Cult. FH & DNT; Müller; Lincs. 1956; sporadic. Often quoted as a bird seed alien but rarely seen.
Raphanus raphanistrum L.: Cult. CGH; Müller; Hovda; occasional.
R. sativus L.: Cult. CGH & JLM; Müller; Lincs. 1963; frequent. A common impurity in Argentinian bird seed. Also cultivated.
Rapistrum perenne (L.) All.: Lincs. 1955; sporadic.
R. rugosum (L.) All.: Cult. CGH & JLM; Müller; Hovda; Lincs. 1963; infrequent.
R. rugosum subsp. *linnaeanum* Rouy & Fouc. (*R. hispanicum* (L.) Crantz): Cult. CGH & JLM.
R. rugosum subsp. *orientale* (L.) Arcangeli (*R. orientale* (L.) Crantz): Cult. CGH; Müller.
Rorippa islandica (Oeder) Borbàs: Cult. CGH; tips; infrequent.
R. sylvestris (L.) Besser: Cult. CGH; sporadic.
Sinapis alba L.: Cult. CGH & JLM; Müller; Hovda; Lincs. 1956; tips; very frequent, but probably overlooked as a bird seed alien.
S. arvensis L.: Cult. CGH; Müller; Hovda; frequent but alien plants probably overlooked.
Sisymbrium altissimum L.: Cult. FH; Lincs. 1956; frequent.
S. orientale L.: Cult. CGH; Hovda; Lincs. 1956; frequent but alien occurrences probably overlooked.
Thlaspi arvense L.: Cult. CGH; frequent.

Resedaceae

Caylusea abyssinica (Fres.) Fisch. & Mey.: Cult. CGH; Müller.

Reseda alba L.: tips; sporadic.

Rosaceae

Potentilla norvegica L.: Cult. CGH. Also recorded from chicken runs.

Leguminosae

ARACHIS HYPOGAEA L. (MONKEY NUT, GROUND NUT or PEANUT): Cult. CGH; tips; sporadic.

- CICER ARIETINUM* L. (CHICKPEA): Cult. CGH & JLM; tips; occasional. Also has a culinary use in Greek and eastern food.
- Coronilla scorpioides* (L.) Koch: Cult. CGH & JLM; Müller; tips; gardens; sporadic.
- Glycine max* (L.) Merr.: Cult. CGH; Müller; tips; gardens; occasional.
- Lathyrus annuus* L.: gardens; occasional.
- L. aphaca* L.: Cult. CGH; Müller; Lincs. 1956; infrequent.
- L. articulatus* L.: Cult. CGH; Müller; gardens; infrequent.
- L. cicera* L.: Cult. CGH & JLM; Müller.
- L. hirsutus* L.: Müller; tips; gardens; sporadic.
- L. latifolius* L.: Cult. CGH. Cultivated in gardens for its garish flowers.
- L. sativus* L.: Cult. CGH; tips; occasional.
- Lens culinaris* Medicus: Cult. CGH & JLM; Müller; tips; infrequent. Also introduced for culinary use.
- Medicago ciliaris* (L.) All.: Cult. CGH.
- M. intertexta* (L.) Miller: gardens; sporadic.
- M. lupulina* L.: Cult. CGH; Müller; occasional.
- M. polymorpha* L. (*M. hispida* Gaertner): Cult. FH; Müller; Lincs. 1955; sporadic. Also very common in wool waste.
- M. sativa* L.: Cult. CGH; Hovda; frequent. Commonly persists after cultivation as a fodder crop.
- M. sativa* subsp. *falcata* (L.) Arcangeli: Cult. FH.
- Melilotus alba* Medicus: Cult. CGH; Lincs. 1956; occasional.
- M. indica* (L.) All.: Cult. CGH; Müller; Hovda; Lincs. 1956; infrequent.
- M. infesta* Guss.: Lincs. 1956; tips; sporadic.
- M. messanensis* (L.) All.: tips; sporadic.
- M. officinalis* (L.) Pallas: Cult. CGH; Müller; Lincs. 1955; frequent.
- M. sulcata* Desf.: Cult. CGH & JLM; Müller; tips; gardens; occasional. Distinctive in fruit but may be overlooked as *M. indica*.
- Ononis alopecuroides* L.: Cult. DNT.
- O. baetica* Clemente (*O. salzmanniana* Boiss. & Reuter): Cult. CGH; tips; gardens; occasional.
- O. mitissima* L.: Cult. CGH; Lincs. 1955; gardens; sporadic.
- Phaseolus vulgaris* L.: Cult. CGH; Müller; Hovda; frequent.
- PISUM SATIVUM* L. (MAPLES): Cult. CGH; Müller; tips; infrequent. Sold as pigeon food.
- P. sativum* subsp. *elatius* (Bieb.) Asch. & Graebner: Cult. CJJ; gardens; sporadic.
- P. sativum* subsp. *sativum*: Cult. CGH; tips; gardens; occasional.
- Psoralea americana* L.: Cult. CGH; occasional. An attractive perennial alien which rarely reaches maturity and rarely sets seed in Britain.
- P. corylifolia* L.: Cult. CGH. One of the few bird seed aliens to originate from India.
- Scorpiurus muricatus* L.: Cult. CGH & JLM; Lincs. 1964; occasional. The seed is a common impurity in Mediterranean seed but the plant only occasionally appears on tips and gardens as a weed.
- S. vermiculatus* L.: gardens; sporadic.
- Trifolium alexandrinum* L.: Lincs. 1956.
- T. angustifolium* L.: Cult. FH; Müller; gardens; sporadic.
- T. echinatum* Bieb.: Lincs. 1955; Müller; sporadic.
- T. hybridum* L.: Cult. CGH; tips; occasional.
- T. incarnatum* L.: Cult. CGH; tips; sporadic.
- T. isthmocarpum* Brot.: Cult. CGH.
- T. lappaceum* L.: Cult. CGH; Lincs. 1955; gardens; sporadic.
- T. pratense* L.: Cult. CGH; Müller. Common on tips usually as a native.
- T. repens* L.: Cult. CGH.
- T. resupinatum* L.: Lincs. 1956; sporadic.
- T. resupinatum* var. *majus* Boiss. (*T. suaveolens* Willd.): Cult. CGH.
- T. scabrum* L.: Lincs. 1956.
- T. subterraneum* L.: Cult. CGH; Müller.
- Trigonella caerulea* (L.) Ser.: Cult. CGH; Müller; tips; sporadic. Unknown out of cultivation.
- T. corniculata* (L.) L.: tips; sporadic.

- T. foenum-graecum* L.: Cult. CGH & JLM; Müller; Lincs. 1956; tips; occasional. Also grown and used as a herb.
- T. polyceratia* L.: Cult. FH.
- Vicia bithynica* (L.) L.: Lincs. 1955; tips; sporadic.
- V. ervilia* (L.) Willd.: Cult. CGH; Müller.
- V. FABA* L. (TIC BEANS): Cult. CGH; frequent. Also cultivated in gardens and on agricultural land.
- V. hirsuta* (L.) S. F. Gray: Cult. CJJ; Müller; tips; sporadic.
- V. lutea* L.: Müller; tips; gardens; sporadic.
- V. narbonensis* L.: Cult. CGH; Müller; tips; sporadic.
- V. pannonica* Crantz: Müller; tips; sporadic.
- V. SATIVA* L. (TARES): Cult. CGH & JLM; Müller; Hovda; infrequent.
- V. sativa* L. subsp. *nigra* (L.) Ehrh.: Cult. CGH; Müller.
- V. tetrasperma* (L.) Schreber: Cult. CGH; Müller; tips; infrequent.
- V. villosa* Roth subsp. *varia* (Host) Corb.: Cult. CGH; Müller; Lincs. 1963; tips; occasional.
- V. villosa* Roth subsp. *villosa*: tips, sporadic.

Linaceae

- Linum bienne* Miller: tips; gardens; sporadic.
- L. tenue* Desf.: gardens; sporadic.
- L. USITATISSIMUM* L. (LINSEED): Cult. CGH & JLM; Müller; Lincs. 1955; frequent. Also escapes from agricultural cultivation.

Euphorbiaceae

- Euphorbia hirta* L.: gardens; sporadic.
- E. serpens* Kunth: Cult. CGH; tips; sporadic.

Malvaceae

- Abutilon theophrasti* Medicus: Cult. CGH; Müller; tips; infrequent.
- Anoda cristata* (L.) Schlecht.: Müller; tips; sporadic.
- Hibiscus trionum* L.: Cult. CGH & JLM; tips; infrequent. An attractive alien which is also cultivated in gardens.
- Lavatera trimestris* L.: Cult. CGH; gardens; occasional. Also cultivated in gardens.
- Malva nicaeensis* All.: Cult. CGH; Müller.
- M. parviflora* L.: Cult. CGH; Müller; Lincs. 1956; occasional.
- M. pusilla* Sm.: Müller; Lincs. 1956; sporadic.
- Sida spinosa* L.: Cult. CGH; tips; sporadic. This and other species of *Sida* are also introduced with soya bean waste.

Cucurbitaceae

- Sicyos angulatus* L. Cult. CJJ; gardens; sporadic.

Lythraceae

- Lythrum junceum* Banks & Solander (*L. meonanthum* Link ex Steudel): Cult. CGH; Lincs. 1963; tips; gardens; infrequent.
- L. salicaria* L.: Cult. CGH. A surprising alien yet cultivated on several occasions.

Umbelliferae

- Aethusa cynapium* L.: Cult. CGH; tips; very frequent.
- Ammi majus* L.: Cult. CGH & JLM; Lincs. 1969; tips; gardens; infrequent.
- A. visnaga* (L.) Lam.: Cult. CGH & JLM; Lincs. 1969; occasional.
- Anethum graveolens* L.: Cult. CGH, JLM & FH; Lincs. 1964; infrequent. This plant can easily be overlooked as a small fennel, or confused with *Ridolfia* unless in ripe fruit.
- Anthriscus caucalis* Bieb.: Cult. CGH; tips; occasional.
- Bifora testiculata* (L.) Roth: Cult. CGH; Müller. Seeds have been seen as an impurity among 'Tares' (*Vicia sativa*).

- Bupleurum fontanesii* Guss. ex Carvel (*B. odontites* L.): Lincs. 1964; Müller; sporadic.
- B. lancifolium* Hornem.: Cult. CGH & JLM; Lincs. 1956; gardens; infrequent. A Mediterranean weed whose seeds regularly appear as impurities in commercial bird seed. Often appears as a garden weed and is frequently mis-recorded as *B. rotundifolium* L. which is unlikely to be found in Britain now.
- Capnophyllum peregrinum* (L.) Lange. (*C. dichotomum*): Cult. CGH & GDW.
- CARUM CARVI* L. (CARAWAY): Müller; tips; occasional. Also introduced for culinary use.
- Caucalis platycarpus* L. (*C. daucooides* L.): Cult. CGH & FH; Müller; Lincs. 1956; sporadic.
- Coriandrum sativum* L.: Cult. CGH & JLM; Lincs. 1963; frequent. Also introduced and grown as a herb.
- CUMINUM CYMINUM* L. (CUMIN): Cult. CGH; tips; occasional. Also used as a herb or spice.
- Daucus carota* L.: Cult. CGH; tips; occasional.
- D. muricatus* (L.) L.: tips; gardens; sporadic.
- Hydrocotyle vulgaris* L.: Cult. CGH.
- Pastinaca sativa* L.: Cult. CGH; tips; infrequent.
- Petroselinum crispum* (Miller) A. W. Hill: Cult. DNT.
- PIMPINELLA ANISUM* L. (ANISEED): Cult. CGH. Also used for culinary purposes.
- Ridolfia segetum* Moris: Cult. CGH; Müller; Lincs. 1955; occasional. Easily confused with *Anethum* unless in ripe fruit.
- Scandix pecten-veneris* L.: Cult. CGH & JLM; Müller; Lincs. 1964; sporadic. The fruits are frequent among seeds imported from the Mediterranean region but the plant itself rarely occurs on tips.
- S. stellata* Banks & Solander: tips; sporadic.
- Torilis arvensis* (Hudson) Link subsp. *neglecta* (Schultes) Thell.: Cult. CGH; tips; occasional.
- T. leptophylla* (L.) Reichenb.: Cult. CGH; Müller; tips; sporadic.
- T. nodosa* (L.) Gaertner: Cult. CGH & JLM; Müller; Lincs. 1969; gardens; occasional.
- Trachyspermum ammi* (L.) Sprague ex Turritt: Cult. FH; Lincs. 1969; tips; infrequent. Also introduced as a spice, 'Ajwan'.
- Turgenia latifolia* (L.) Hoffm. (*Caucalis latifolia* L.): Cult. FH; Müller; gardens; sporadic.

Primulaceae

- Anagallis arvensis* L.: Cult. CGH; Müller; Lincs. 1956. The plants we have seen have blue flowers with red centres. Genuine *A. foemina* Miller has not been observed as a bird seed weed.

Rubiaceae

- Asperula arvensis* L.: Cult. CGH & JLM; Müller; Lincs. 1956; gardens; occasional. Introduced from the Mediterranean region. Probably easily overlooked unless in flower.
- Crucianella angustifolia* L.: Cult. CGH & CJJ; Müller; gardens; sporadic.
- Galium aparine* L.: Cult. CGH; Müller; very frequent. Introduced plants could be easily overlooked.
- G. parisiense* L.: Cult. CGH; Müller; gardens; sporadic.
- G. tricornutum* Dandy: Cult. CGH & JLM; Müller; Lincs. 1956; gardens; occasional. Seeds are regular impurities in imported seed but the plant itself is rarely found.
- G. verrucosum* Hudson (*G. saccharatum* All.): Cult. CGH; gardens; sporadic.
- G. viscosum* Vahl (*G. campestre* Schousboe ex Willd.): Cult. CGH.

Convolvulaceae

- Convolvulus althaeoides* L.: Cult. CGH; tips; gardens; occasional.
- C. arvensis* L.: Cult. CGH; Müller; infrequent.
- C. tricolor* L.: Lincs. 1963; tips; gardens; sporadic.
- Cuscuta australis* R. Br. subsp. *cesattiana* (Bertol.) Feinbrun: tips; sporadic.
- C. campestris* Yuncker: Cult. CGH; tips; gardens; occasional.
- Ipomoea eriocarpa* R. Br.: Cult. CGH.
- I. hederacea* Jacq.: Cult. CGH; tips; gardens; sporadic. This species, both as var. *hederacea* and as the following variety, occurs regularly as a soya bean alien.
- I. hederacea* var. *integriuscula* Gray: Cult. CGH.

I. purpurea Roth (*Pharbitis purpurea* (Roth) Voight): Cult. CGH; Müller; tips; occasional. Also cultivated as a garden plant.

Boraginaceae

Amsinckia calycina (Moris) Chater: Cult. CGH.

A. intermedia Fisch. & Mey.: Cult. CGH; tips; sporadic.

Anchusa azurea Miller: Cult. CGH & JLM; Müller; occasional. Also cultivated as a decorative garden flower.

Buglossoides arvensis (L.) I. M. Johnstone (*Lithospermum arvense* L.): Cult. CGH & JLM; Müller; Lincs. 1956; occasional.

Cynoglossum lanceolatum Forsk.: Cult. CGH.

Lappula squarrosa (Retz.) Dumort. (*L. myosotis* Moench): Cult. CGH & JLM; Müller; tips; sporadic.

Verbenaceae

Verbena supina L.: tips; sporadic.

Labiatae

Dracocephalum parviflorum Nutt.: tips; sporadic.

Salvia reflexa Hornem.: Cult. CGH & JLM; Lincs. 1953; tips; occasional. Regularly introduced with millet seed from America.

Sideritis romana L.: Cult. CGH.

Teucrium resupinatum Desf.: gardens; sporadic.

Solanaceae

CAPSICUM ANNUUM L. (SPANISH PEPPER): Cult. CGH; tips; occasional.

Datura ferox L.: Cult. CGH; Müller. Occurs more often as a wool alien.

D. stramonium L.: Cult. CGH; Müller; Lincs. 1964; frequent. Persists on some rubbish tips and waste ground.

D. stramonium var. *tatula*: Cult. CGH; tips; occasional.

Hyoscyamus niger L.: Cult. FH; Lincs. 1956. Quite common on tips and waste ground from other sources.

Nicandra physalodes (L.) Gaertner: Cult. CGH & JLM; Lincs. 1963; tips; frequent. Occasionally cultivated in gardens for its attractive flowers and decorative dried fruits.

Physalis peruviana L.: tips; occasional.

P. philadelphica Lam.: tips; sporadic.

Solanum cornutum Lam. (*S. rostratum* Dunal): Cult. CGH; tips; gardens; occasional. A distinctive weed from the U.S.A. where it is the native foodplant of the Colorado Beetle.

S. luteum Miller: tips; sporadic.

S. nigrum L.: Cult. CGH; Lincs. 1963.

S. pseudocapsicum L.: Cult. CGH; tips; occasional.

S. sarrachoides Sendtner: Cult. CGH; sometimes becomes established on waste ground and tips.

S. sisymbriifolium Lam.: tips; sporadic.

Scrophulariaceae

Calceolaria chelidonioides H.B.K.: Cult. FH; gardens; sporadic.

Kickxia elatine (L.) Dumort.: gardens; sporadic.

K. spuria (L.) Dumort.: gardens; sporadic.

Linaria maroccana Hook. f.: tips; sporadic.

Misopates calycinum Rothm.: Cult. CGH; tips; gardens; occasional.

M. orontium (L.) Raf.: Cult. CGH; gardens; infrequent.

Verbascum phoeniceum L.: gardens; sporadic. Also cultivated as an ornamental plant.

Veronica persica Poiret: Cult. CGH; Müller; tips; occasional but often as a native.

V. polita Fries: Cult. CGH.

Pedaliaceae

Sesamum indicum L.: Cult. CGH; tips; occasional.

Plantaginaceae

Plantago afra L. (*P. psyllium* L.): Cult. CGH; Lincs. 1953; occasional. May be mis-recorded as the next species which it closely resembles.

P. arenaria Waldst. & Kit. (*P. indica* L.): Cult. FH; Hovda; tips; gardens.

P. lagopus L.: Cult. CGH; Lincs. 1955; sporadic.

P. lanceolata L.: Cult. CGH; Müller; very frequent. Alien occurrences could be easily overlooked.

P. major L.: Cult. CGH; Müller; very frequent.

Dipsacaceae

Cephalaria syriaca (L.) Roemer & Schultes: Cult. CGH; Müller.

Dipsacus fullonum L.: Cult. CGH; Lincs. 1955.

D. SATIVUS (L.) Honckeny (FRENCH TEAZLE): Cult. CGH; Lincs. 1955; tips; occasional. Also cultivated for finishing cloth.

Compositae

Ambrosia artemisiifolia L.: Cult. CGH; gardens; occasional. Regularly introduced with millet seed from the U.S.A.

Anthemis cotula L.: Müller; Lincs. 1956.

A. ruthenica Bieb.: Lincs. 1956.

A. tinctoria L.: Cult. FH. Also grown as a garden plant.

Arctium minus Bernh.: Cult. CGH. Alien occurrences could easily be overlooked.

Athanasia crithmifolia L.: gardens; sporadic.

Bidens bipinnata L.: Cult. CGH. Not uncommon as a wool alien.

B. biternata (Low) Merr. & Sherff: Cult. CGH.

B. frondosa L. This and the next species occur as casuals on tips but the authors have no certain evidence that they are introduced with bird seed.

B. pilosa L.: Müller.

B. tripartita L.: Cult. CGH; tips; infrequent.

Calendula officinalis L.: Lincs. 1956.

Carduncellus caeruleus (L.) C. Presl (*Carthamus caeruleus* L.): Cult. CGH.

Carduus pycnocephalus L.: Cult. CGH.

C. tenuiflorus Curtis: Cult. CGH & JLM; Müller.

Carthamus lanatus L.: Cult. FH; sporadic. Usually a wool alien.

C. TINCTORIUS L. (SAFFLOWER): Cult. CGH & JLM; Müller; Lincs. 1955; tips; frequent. The seeds are used as a bird food because of their high oil content.

Centaurea calcitrapa L.: Cult. FH; Lincs. 1953; tips; sporadic.

C. cineraria L.: Cult. FH.

C. cyanus L.: Cult. CGH & JLM; Müller; Lincs. 1956; sporadic.

C. diffusa Lam.: Müller; tips; sporadic.

C. diluta Aiton: Cult. CGH & JLM; Lincs. 1964; tips; frequent. Regularly introduced with Canary Grass seed from N. Africa. It can survive mild winters in Britain and is regularly seen on the old parts of rubbish tips.

C. eriophora L.: Cult. CGH.

C. hyalolepis Boiss. (*C. pallescens* Del.): Lincs. 1964; sporadic.

C. melitensis L.: Cult. CGH & JLM; Müller; Lincs. 1953; sporadic.

C. nigra L.: Cult. CGH. Also occurs as a native.

C. solstitialis L.: Cult. CGH; Müller; Lincs. 1953; tips; gardens; occasional. A distinctive weed from the Mediterranean region.

C. solstitialis subsp. *adamii* (Willd.) Nyman: Lincs. 1964; sporadic. A variant that lacks the conspicuous involucre bracts of the type.

C. triumfetti All.: Cult. CGH.

Chamaemelum mixtum (L.) All. (*Anthemis mixta* L.): Lincs. 1964; gardens; sporadic.

- Chamomilla suaveolens* (Pursh) Rydb. (*Matricaria matricarioides* (Less.) Porter, pro parte): Cult. CGH.
- Chrysanthemum carinatum* Schousboe: Lincs. 1956.
- C. coronarium* L.: Cult. CGH & CJ; Lincs. 1953.
- C. segetum* L.: Lincs. 1956.
- Cichorium endivia* L.: Lincs. 1956; tips; sporadic.
- C. INTYBUS* L. (CHICORY): Cult. CGH & JLM; Müller; Lincs. 1963; frequent. Also cultivated in gardens and on an agricultural scale.
- Cnicus benedictus* L.: Cult. CGH.
- Coreopsis schimperi* O. Hoffm. (*C. abyssinica*): Cult. CGH. Very difficult to raise to maturity and therefore unlikely to occur as a casual in Britain.
- Cosmos bipinnatus* Car.: Cult. CGH; tips; occasional.
- Crepis nicaeensis* Balbis: gardens; sporadic.
- Galactites tomentosa* Moench: Cult. FH.
- Galinsoga ciliata* (Raf.) S. F. Blake: Cult. FH. Frequent on tips but probably from other sources.
- GUIZOTIA ABYSSINICA* (L. f.) Cass. (NIGER): Cult. CGH & JLM; Müller; Hovda; Lincs. 1956; frequent. A staple bird food included in many bird seed mixtures.
- Hedynois cretica* (L.) Dum.-Courset (*H. rhagadioloides* (L.) F. W. Schmidt): Cult. CGH & JLM; Lincs. 1964; occasional.
- HELIANTHUS ANNUUS* L. (SUNFLOWER): Cult. CGH & JLM; Müller; Hovda; Lincs. 1955; tips; very frequent. The seeds are regularly used as parrot food and also incorporated in food for small mammals such as gerbils.
- H. tuberosus* L.: Cult. FH.
- Iva xanthifolia* Nutt.: Cult. DNT; tips; sporadic.
- Lactuca saligna* L.: Cult. CJJ; Müller.
- L. SATIVA* L. (LETTUCE): Cult. CGH & JLM; Müller; frequent. Also grown as a garden vegetable.
- L. virosa* L.: Cult. CGH.
- Mantisalca salmantica* (L.) Briq. & Cavillier (*Centaurea salmantica* L.): Cult. CGH; Lincs. 1953; sporadic.
- Matricaria maritima* L.: Cult. CGH; Müller.
- Picris echioides* L.: Cult. CGH & JLM; Müller; Lincs. 1955; frequent.
- P. sprengerana* (L.) Poirer: Müller; Lincs. 1955; sporadic.
- Rhagadiolus stellatus* (L.) Gaertner: Cult. CGH & JLM; Müller; Lincs. 1956; tips; gardens; sporadic. Easily overlooked as it is inconspicuous except in fruit.
- Scolymus hispanicus* L.: Cult. CGH & JLM; Lincs. 1953; sporadic.
- Senecio squalidus* L.: Cult. CGH.
- S. sylvaticus* L.: Cult. CGH.
- S. viscosus* L.: Cult. FH.
- Silybum marianum* (L.) Gaertner: Cult. CGH & JLM; Müller; tips; infrequent. An attractive biennial which can persist for several years.
- Sonchus asper* (L.) Hill subsp. *glaucescens* (Jordan) Ball: Cult. CGH; Müller; Hovda.
- S. tenerrimus* L.: gardens; sporadic.
- Tolpis barbata* (L.) Gaertner: gardens; sporadic.
- Tragopogon hybridus* L. (*Geropogon glaber* L.): Cult. CGH & JLM; Müller; Lincs. 1955; sporadic. The long, needle-like fruits are frequent in Mediterranean seed but they are easily separated during cleaning, hence the plant is rather scarce as a weed.
- Verbesina encelioides* (Cav.) Benth. & Hook. f. ex A. Gray: Cult. FH.
- Wedelia glauca* (Ort.) Hoffm. ex Hicken: Cult. CGH, FH & CJJ. Spreads by rhizomes in cultivation.
- Xanthium spinosum* L.: Cult. JLM; Lincs. 1965; occasional. Much more characteristic as a wool alien.

Liliaceae

Ornithogalum sp.: Cult. CGH but not yet grown to maturity.

Juncaceae

Juncus effusus L.: Cult. CGH.

Gramineae

- Alopecurus myosuroides* Hudson: Cult. CGH; Müller; Lincs. 1956; tips; infrequent.
Apera spica-venti (L.) Beauv.: Cult. CJJ.
Arthraxon hispidus (Thunb.) Makino var. *cryptatherus* (Hack.) Honda: Cult. CGH.
Avena fatua L.: Cult. CGH & JLM; Müller; Hovda; frequent.
A. nuda L. (*A. strigosa* var. *nuda* (L.) Hausskn.): Cult. CGH.
A. SATIVA L. (CLIPPED OATS): Cult. CGH & GDW; Müller; Hovda; tips; frequent.
Beckeropsis nubica (Hochst.) Figari & De Notaris: Cult. CGH & GDW. Cultivated from impurities in imported Ethiopian Niger seed. This and the following species are difficult to raise and would be unlikely to occur as aliens in Britain.
B. betularis (Hochst.) Figari & De Notaris: Cult. CGH.
Beckmannia syzigachne (Steudel) Fern.: tips; sporadic.
Brachiaria eruciformis (Sm.) Griseb.: Cult. CGH; tips; sporadic.
B. platyphylla (Griseb.) Nash: Cult. CGH; tips; occasional.
Brachypodium distachyon (L.) Beauv.: Cult. CGH; Müller; Lincs. 1964; occasional.
B. sylvaticum (Hudson) Beauv.: Cult. CGH; tips; sporadic.
Briza minor L.: Cult. CJJ.
Bromus arvensis L.: Cult. FH; Müller.
B. japonicus Thunb.: gardens; sporadic.
B. lanceolatus Roth: Cult. CJJ; tips; occasional.
B. madritensis L.: Cult. CGH; tips; occasional.
B. tectorum L.: Cult. FH; Müller.
B. willdenowii Kunth (*B. unioloides* H. B. K.): Cult. CGH & JLM; Müller; Lincs. 1956; gardens; occasional.
Cenchrus incertus M. A. Curtis (*C. pauciflorus* auct. non Benth.): Cult. CGH. Fruits occur frequently among millet and other seed imported from the Americas but the plant is a rare weed.
Cynodon dactylon (L.) Pers.: Cult. CGH; tips; occasional.
Dactylis glomerata L.: Cult. CGH. Also occurs as a native.
Dactyloctenium aegyptium (L.) Beauv.: Cult. CGH.
Digitaria ciliaris (Retz.) Koeler (*D. adscendens* (H.B.K.) Henrard): Cult. CGH; tips; occasional.
D. ischaemum (Schreber) Muhl.: Cult. CGH & CJJ; gardens; sporadic.
D. sanguinalis (L.) Scop.: Cult. CGH & JLM; Müller; Lincs. 1969; tips; occasional. Similar to, and easily confused with, *D. ciliaris*.
D. ternata (A. Rich.) Stapf.: Cult. CGH.
Diplachne uninerva (Presl) Parod.: tips; sporadic.
Echinaria capitata (L.) Desf.: Cult. CJJ.
Echinochloa colonum (L.) Link: Cult. CGH; Müller; Lincs. 1963; tips; occasional.
E. crus-galli (L.) Beauv.: Cult. CGH & JLM; Müller; Hovda; Lincs. 1955; tips; frequent.
E. frumentacea Link: Cult. CGH.
E. UTILIS Ohwi & Yabano (*E. FRUMENTACEA* auct. non Link) (JAPANESE MILLET): Cult. CGH & JLM; Lincs. 1965; very frequent. An Asian cereal which is a common weed on rubbish tips.
Eleusine africana K. O'Byrne: Cult. FH; tips.
E. indica (L.) Gaertner: Cult. CGH; tips; occasional.
E. tristachya (Lam.) Lam.: gardens; sporadic.
Eragrostis cilianensis (All.) F. T. Hubbard: Cult. CGH; tips; occasional.
E. neomexicana Vasey: Cult. CGH; tips; sporadic.
E. pilosa (L.) Beauv.: tips; sporadic.
E. tef (Zucc.) Trotter: Cult. CGH & GDW; tips; occasional.
E. virescens J. & C. Presl: Cult. CGH.
Gastridium ventricosum (Gouan) Schinz & Thell.: Cult. CGH & JLM.
Hainardia cylindrica (Willd.) Greuter (*Monerma cylindrica* (Willd.) Cross & Dur.): Cult. CGH & JLM; Lincs. 1956; tips; occasional.
HORDEUM DISTICHON L. (BARLEY): Cult. CGH; Müller; Hovda; frequent.
H. jubatum L.: Cult. FH. Often becomes established on waste ground. Also introduced in grass seed.
H. VULGARE L. (BARLEY): Cult. CGH & GDW; Müller; Hovda; very frequent.

- Hyparrhenia anthristirioides* (A. Rich.) Stapf: Cult. CGH. Cultivated from impurities in Ethiopian Niger seed but unlikely to occur as a weed in Britain.
- Lagurus ovatus* L.: Cult. CJJ.
- Lolium multiflorum* Lam.: Cult. CGH & JLM; Müller; Hovda; Lincs. 1953; very frequent.
- L. multiflorum* Lam. × *L. temulentum* L.: tips; sporadic.
- L. perenne* L.: Cult. CGH & JLM; Müller; Hovda; very frequent.
- L. remotum* Schrank: Cult. CGH; Müller.
- L. rigidum* Gaudin: Cult. CGH; Lincs. 1956; tips; sporadic.
- L. temulentum* L.: Cult. CGH & JLM; Müller; Hovda; Lincs. 1956; frequent. Usually introduced with seed from the Mediterranean countries.
- Microstegium vimineum* (Trin.) A. Camus.: Cult. CGH.
- Oplismenus hirtellus* (L.) Beauv.: Cult. CGH. Cultivated regularly from impurities in Ethiopian Niger seed.
- ORYZA SATIVA** L. (PADDY RICE): Cult. CGH; Müller. Used as a bird food with the husk still surrounding the grains. Unlikely to occur as a weed in Britain.
- Panicum capillare* L.: Cult. CGH & JLM; tips; occasional. Usually introduced with millet from the U.S.A.
- P. dichotomifolium* Michx: tips; sporadic.
- P. effusum* R. Br.: tips; sporadic.
- P. laevifolium* Hack.: Cult. CGH; Lincs. 1965; occasional.
- P. MILIACEUM** L. (BROOMCORN MILLET): Cult. CGH & JLM; Müller; Hovda; Lincs. 1955; very frequent. A staple food for birds used in a number of different colour varieties, e.g. red, yellow and white. By far the commonest bird seed alien on tips.
- Parapholis strigosa* (Dumort.) C. E. Hubbard: Cult. CGH. Very similar in appearance to *Hainardia*.
- Pennisetum glabrum* Steud.: Cult. CGH.
- Phalaris aquatica* L. (*P. tuberosa* L.): Cult. FH & CJJ.
- P. brachystachys* Link: Cult. CGH; tips; sporadic.
- P. CANARIENSIS** L. (CANARY GRASS): Cult. CGH & JLM; Hovda; Lincs. 1953; tips; very frequent. A most important species for cage birds. The seeds are included in most commercial mixtures for budgerigars and canaries.
- P. minor* Retz.: Cult. FH; Lincs. 1953; occasional.
- P. paradoxa* L.: Cult. CGH & JLM; Müller; Lincs. 1955; gardens; infrequent. Regularly imported with Moroccan Canary Grass seed.
- Phleum pratense* L.: Cult. CGH.
- Piptatherum miliaceum* (L.) Cosson (*Oryzopsis miliacea* (L.) Benth. & Hook. f.): Cult. FH.
- Poa annua* L.: Cult. CGH.
- Polypogon monspeliensis* (L.) Desf.: Lincs. 1963; tips; occasional.
- SECALE CEREALE** L. (RYE): Cult. CGH & JLM; Müller; Hovda; Lincs. 1956; frequent.
- Setaria faberi* Herrm.: Cult. CGH; tips; gardens; occasional. Probably introduced with millets from the U.S.A.
- S. geniculata* (Lam.) Beauv.: Cult. CGH; Müller; tips; gardens; occasional. Introduced with millets from the U.S.A.
- S. ITALICA** (L.) Beauv. (MILLET SPRAY, PANICUM MILLET): Cult. CGH & JLM; Müller; Hovda; Lincs. 1953; frequent. Usually sold as an intact inflorescence but sometimes incorporated into mixtures as loose seed, hence the two commercial names.
- S. macrostachya* H. B. K.: Cult. CJJ.
- S. pumila* (Poiret) Schultes (*S. glauca* (L.) Beauv.): Cult. CGH & JLM; Müller; tips; infrequent.
- S. sphacelata* (Schumacher) Stapf & Hubbard: Cult. CGH. Another African plant introduced with Ethiopian Niger seed.
- S. verticillata* (L.) Beauv.: Cult. CGH; tips; gardens; sporadic.
- S. viridis* (L.) Beauv.: Cult. CGH & JLM; Müller; Hovda; Lincs. 1955; very frequent. An impurity in many types of seed, it may persist for a few years in places.
- SORGHUM BICOLOR** (L.) Moench. (**S. SACCHARATUM** (L.) Pers.) (RED DARI): Cult. CGH & JLM; Müller; tips; infrequent. Used in wild bird food mixtures.
- S. halepense* (L.) Pers.: Cult. CGH, JLM & GDW; Müller; tips; occasional. May persist for several years.

Sporobolus panicoides (Hochst.) A. Rich.: Cult. CGH. Another exotic grass from Ethiopia which is difficult to raise successfully.

TRITICUM AESTIVUM L. (*T. VULGARE* Vill.) (WHEAT): Cult. CGH, JLM & GDW: Müller: Hovda; frequent.

Urochloa panicoides Beauv.: Cult. CGH; Lincs. 1955; occasional.

ZEA MAYS L. (SWEETCORN): Cult. CGH & JLM: Müller; tips; frequent. Used both as a bird food and in pet food for small mammals.

Cyperaceae

Carex demissa Hornem.: Cult. CGH.

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