

## Survey of weeds in maize crops in Europe

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# PREFACE

This desk study was commissioned by Monsanto Europe SA. The objective of the study was to map weed occurrence in maize in key maize growing regions in Europe. Information was collected by contacting leading experts throughout Europe and we would like to acknowledge the contributions of these experts.

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# 1 INTRODUCTION

According to EUROSTAT the production area with maize in EU was approximately 13 million ha in 2009. The production area in selected European countries is shown in Table 1. Croatia, Bosnia & Hercegovina and Greece are other large maize producing countries.

**Table 1.** Maize production area in 2009 (1000 ha) in selected European countries and EU total. Source EUROSTAT.

	<b>Green maize</b>	<b>Grain Maize</b>	<b>Maize total</b>
Denmark	172		172
Germany	1647	464	2111
UK	166		166
Belgium		67	67
Netherlands	242	19	261
France	1445	1680	3125
Spain	93	348	441
Poland	419	274	693
Czech Republic	166	105	271
Hungary	87	1177	1264
Romania*	33	2339	2372
Italy	261	916	1177
Sum 12 countries	4731	7389	12120
EU <sub>25</sub> total	5255	5750	11005

\* Romania with a large maize production became EU member 26 and 27 together with Bulgaria and their production area is not included in the EU<sub>25</sub> statistics.

In the north-western part of Europe with a temperate coastal climate maize is primarily grown for silage production. In the central part of Europe with a warmer temperate climate both green maize and grain maize are grown whereas in the subtropical parts of Europe maize is primarily grown for grain production. Recently maize is also grown as a bioenergy crop.

The geographical area covers temperate coastal and continental climate and Mediterranean subtropical climate areas as well. The different climate and soil characteristics in the production area together with different cultivation practices influence the weed biodiversity in maize cropping. This paper presents a survey of weed species distribution and incidence in maize production in selected European countries.

## 2 MATERIALS AND METHODS

The data were collected by asking maize weed specialists in the selected countries/regions to fill in a questionnaire. The objective was to create a database of weeds reported in maize fields in key maize growing regions of Europe. Their contribution could be in the form of 1) a recently performed survey of weeds in maize, 2) an expert evaluation classifying weed species into three categories (very common, common and less common/rare) or 3) a list of weed occurrence and frequency generated on basis of weed registrations in herbicide efficacy experiments or 4) a combination of the previous mentioned methods.

All contacted experts representing Belgium, Czech Republic, Denmark, France, Germany, Hungary, Italy, Poland, Romania, Spain (Andalucia and Catalonia) and the UK responded to the questionnaire. As a desk study based on available information on weeds originating from different sources the data will be more heterogeneous than a survey created using a common method. However we believe that the survey can provide an overview of the distribution and incidence of weeds in maize cropping. In the following the contribution from each country is described:

### 2.1 Belgium

Information was obtained from Guy Foucart ([guy.foucart@uclouvain.be](mailto:guy.foucart@uclouvain.be)), CIPF asbl, Laboratoire d'Ecophysiologie et d'Amélioration végétale, Faculté d'ingénierie biologique agronomique et environnementale who submitted an expert evaluation according to method 2 (Page 26).

### 2.2 Czech Republic

Data from the Czech Republic were obtained from Josef Soukup ([soukup@af.czu.cz](mailto:soukup@af.czu.cz)), who made an expert evaluation according to method 2 (Page 27).

### 2.3 Denmark

Information was gathered by Peter Kryger Jensen ([peterk.jensen@agrsci.dk](mailto:peterk.jensen@agrsci.dk)), Aarhus University, Faculty of Agricultural Sciences, Department of Integrated Pest Management. Data originate from assessments of weeds in untreated plots of herbicide efficacy trials carried out at the department from 2000-2010 (27 trials). Corresponding trials carried out by the Knowledge Centre of Agriculture from 2004-2010 (37 trials) was gathered by Jens Erik Jensen ([jnj@vfl.dk](mailto:jnj@vfl.dk)). Less common weeds are in both types of experiments grouped as “miscellaneous weeds”. Very common and common weeds were generated by method 3 while the list of less common weeds was the result of an expert evaluation (Page 28).

## 2.4 France

Information was provided by Jean-Baptiste Thibord ([jb.hibord@arvalisinstitutduvegetal.fr](mailto:jb.hibord@arvalisinstitutduvegetal.fr)) and Valerie Bibard ([v.biard@arvalisinstitutduvegetal.fr](mailto:v.biard@arvalisinstitutduvegetal.fr)) both from Arvalis – Institut du vegetal. They made an expert evaluation according to method 2 (Page 29).

## 2.5 Germany

Information was submitted by Wolfgang Voegler. The German input was a weed survey made by Kleffmann in 2008 assessing frequency of weeds in maize crops (Page 30).

## 2.6 Hungary

Hungarian input is based on method 1 and comes from a recent survey published by the Ministry of Agriculture and Rural Development in 2009 (Arable weeds of Hungary. 5<sup>th</sup> National Weed Survey (2007-2008) by Robert Novak, Istvan Dancza, Laszlo Szentey and Jozsef Karaman). The survey has a special section on weeds in maize (Page 31).

## 2.7 Italy

Maurizio Sattin ([maurizio.sattin@ibaf.cnr.it](mailto:maurizio.sattin@ibaf.cnr.it)) gathered information on weeds in maize in Northern Italy (Po Valley). Data are a combination of weed surveys, published information and recent expert interviews carried out as part of the EU project ENDURE (Pages 32-33).

## 2.8 Poland

Data from Poland were provided by Elzbieta Czembor ([e.czembor@ihar.edu.pl](mailto:e.czembor@ihar.edu.pl)) who made an expert evaluation according to method 2 (Pages 34-35). Further data from a review by Meissle *et al.* (2010) were used (Page 36).

## 2.9 Romania

Data from Romania were provided by Sandoiu Dumitru ([sandoiu\\_dumitru@yahoo.com](mailto:sandoiu_dumitru@yahoo.com)), who made an expert evaluation according to method 2 (Pages 37-39).

## 2.10 Spain (Andalucia and Catalonia)

Two inputs were collected from Spain, one from Andalusia in the southern part and one from the Ebro Valley in Northern part from. Milagros Saavedra ([mariam.saavedra@juntadeandalucia.es](mailto:mariam.saavedra@juntadeandalucia.es)) supplied data from Andalusia. This information was a weed survey carried out 1983-1984 (Pages 40-42). Data from the Northern part were an expert evaluation according to method 2 carried out by Andreu Palou ([ataberner@gencat.cat](mailto:ataberner@gencat.cat)) (Page 43).

## 2.11 UK

Bob Froud-Williams ([r.j.froud-williams@reading.ac.uk](mailto:r.j.froud-williams@reading.ac.uk)) from Reading University supplied data from UK. These were based on an expert evaluation according to method 2 (Page 44).

Where data were delivered according to method 2 weeds were classified in three categories (very common, common and less common/rare). If data originated from one of the other methods, weeds were classified into one of these three categories before presenting them in the Results section. An additional 4. category was introduced describing weeds as being very rare/absent or missing information.



## 3 RESULTS

Table 2 shows the frequency of weed species in the countries included in the survey. The table contains all weed species assessed as “very common” in at least one country, in total 61 weed species. Only one species, *Chenopodium album*, was evaluated as very common in all 11 countries.

Weed species are adapted to the environment and has a preferred optimum climate. Generally the frequency distribution followed the expected pattern with a high frequency in countries with favorable climatic conditions and low frequency or absence in countries with unfavorable climatic conditions. Deviations from this pattern can probably be attributed to the heterogeneous way data in the survey were collected.

A total of 203 different weed species were reported in the survey. These are listed in Table 3a (sorted according to species name) and Table 3b (sorted according to species family). The frequencies of 16 weed species are illustrated in Figures 1-16.

The information received from the different countries is compiled in Annex 1.

Recently, a mini weed survey was published as part of a review by Meissle *et al.* (2010) on pests and pesticide use in European maize production. This weed survey is included in Annex 1.

**Table 2.** Frequency of weed species in the countries included in the survey. The table includes all weed species which were evaluated as “very common” in at least one country. XXXX=very common, XXX= common, XX=Less common/rare, X=very rare, 0=very rare, absent or no information. (The table continues on the next pages).

Weed species Family in ()	Denmark	Germany	Belgium	UK	Poland	Czech Republic	Hungary	Romania	France	Spain	Italy
<i>Abutilon theophrasti</i> (Malvaceae)	0	0	0	0	0	XX	XXX	0	XX	XXXX	XXX
<i>Alopecurus myosuroides</i> (Poaceae)	X	XXXX	XXXX	0	0	0	0	0	0	0	0
<i>Amaranthus</i> spp. (Amaranthaceae)	0	XXX	XXX	0	XXXX	XXXX	XXXX	0	XXX	XXXX	XXXX
<i>Ambrosia artemisiifolia</i> (Asteraceae)	0	0	0	0	XX	0	XXXX	0	0	0	XX
<i>Anthemis arvensis</i> (Asteraceae)	X	0	XX	0	XXXX	XX	0	XXXX	0	0	XX
<i>Atriplex patula</i> (Chenopodiaceae)	X	XXXX	XXXX	0	0	0	0	0	0	XX	XX
<i>Calystegia sepium</i> (Convolvulaceae)	X	0	XXX	0	X	0	0	0	XXXX	XXX	XXX
<i>Capsella bursa-pastoris</i> (Brassicaceae)	XXXX	XX	XXXX	XXXX	XXXX	XXX	0	XXXX	0	XXX	0
<i>Cardaria draba</i> (Brassicaceae)	0	0	0	0	0	0	0	XXXX	0	XXX	0
<i>Centaurea cyanus</i> (Asteraceae)	X	XX	0	0	XXXX	0	0	XXXX	0	0	0
<i>Chenopodium album</i> (Chenopodiaceae)	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
<i>Cicorium inthybus</i> (Asteraceae)	0	0	0	0	0	0	0	XXXX	0	X	0
<i>Cirsium arvense</i> (Asteraceae)	XXX	XXX	XXX	0	XXXX	XXX	XXXX	XXXX	0	0	0
<i>Convolvulus arvensis</i> (Convolvulaceae)	X	XXX	0	0	XX	XXX	XXXX	XXXX	0	XXXX	XXX
<i>Conyza</i> spp. (Asteraceae)	0	0	XX	0	0	0	0	0	0	XXXX	0
<i>Cyperus rotundus</i> (Cyperaceae)	0	0	0	0	0	0	0	0	0	XXXX	XX
<i>Datura stramonium</i> (Solanaceae)	0	0	XX	0	XX	XX	XXXX	XXXX	XXX	XXXX	XXX
<i>Digitaria sanguinalis</i> (Poaceae)	0	0	XXX	0	XX	XX	XXX	XXXX	XXXX	XXXX	XXXX
<i>Echinochloa crus-galli</i> (Poaceae)	X	XXXX	XXXX	0	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
<i>Eleusine indica</i> (Poaceae)	0	0	0	0	0	0	0	0	0	XXXX	0
<i>Elymus repens</i> (Poaceae)	XXX	XXXX	XX	0	XXXX	XXXX	XXX	XX	0	0	XX

<b><i>Equisetum arvense</i></b> (Equisetaceae)	XX	0	XX	0	0	0	0	XXXX	0	0	XXX
<b><i>Erigeron Canadensis</i></b> (Asteraceae)	X	0	0	0	0	0	0	XXXX	0	0	0
<b><i>Euphorbia cyparissias</i></b> (Euphorbiaceae)	0	0	0	0	0	0	0	XXXX	0	0	0
<b><i>Fumaria</i> spp.</b> (Fumariaceae)	XX	0	XXX	0	0	XXXX	0	XXXX	0	XX	0
<b><i>Galium aparine</i></b> (Rubiaceae)	XXX	XXXX	XXX	0	XXXX	XXXX	0	XXXX	0	XX	0
<b><i>Galinsoga</i> spp.</b> (Asteraceae)	X	XXX	XXXX	0	0	0	0	XX	0	0	XXX
<b><i>Geranium</i> spp.</b> (Geraniaceae)	XXXX	XX	XXX	0	XX	0	0	0	0	0	0
<b><i>Hibiscus trionum</i></b> (Malvaceae)	0	0	0	0	0	0	XXX	XXXX	0	0	0
<b><i>Lamium</i> spp.</b> (Lamiaceae)	XXXX	XX	XXX	XXXX	XXXX	XXX	0	XX	0	XX	XX
<b><i>Matricaria chamomilla</i></b> (Asteraceae)	0	0	0	0	0	0	0	XXXX	0	0	0
<b><i>Mercurialis annua</i></b> (Euphorbiaceae)	0	0	XXXX	0	0	XXX	0	0	XXX	X	XX
<b><i>Oxalis latifolia</i></b> (Oxalidaceae)	0	0	0	0	0	0	0	0	0	XXXX	0
<b><i>Panicum</i> spp.</b> (Poaceae)	0	XXXX	0	0	XXX	0	XXXX	0	XX	XX	XXX
<b><i>Paspalum paspaloides</i></b> (Poaceae)	0	0	0	0	0	0	0	0	0	XXXX	0
<b><i>Phragmites communis</i></b> (Poaceae)	X	0	0	0	0	0	0	0	0	0	0
<b><i>Poa annua</i></b> (Poaceae)	XXXX	XXXX	XXXX	XXXX	X	0	0	0	0	XX	XXX
<b><i>Polygonum aviculare</i></b> (Polygonaceae)	XXXX	XX	XXXX	XXXX	XXXX	XXX	0	XXXX	0	XXXX	XXX
<b><i>Polygonum convolvulus</i></b> (Polygonaceae)	XXXX	XXXX	XXXX	XXXX	0	XXXX	0	XXXX	0	XX	XXX
<b><i>Polygonum persicaria/lapathifolium</i></b> (Polygonaceae)	XXX	XX	XXXX	XXXX	0	XXXX	XXX	XX	XXX	XX	XXXX
<b><i>Other polygonum</i> spp.</b> (Polygonaceae)		0	XX	0	0	0	0	XXXX	0	X	0
<b><i>Portulaca oleracea</i></b> (Portulacaceae)	0	0	0	0	0	0	0	XXXX	XX	XXXX	XXX
<b><i>Ranunculus repens</i></b> (Ranunculaceae)	0	0	0	0	0	0	0	XXXX	0	0	0
<b><i>Raphanus raphanistrum</i></b>	X	0	XXX	0	0	XXX	0	XXXX	0	0	XX

(Brassicaceae)											
<i>Rubus caesius</i> (Rosaceae)	0	0	0	0	0	0	0	XXXX	0	0	0
<i>Rumex</i> spp. (Polygonaceae)	XX	XXX	XX	0	0	XXX	0	XXXX	0	XX	XX
<i>Senecio vulgaris</i> (Asteraceae)	XX	XX	XXXX	XXXX	0	0	0	0	0	XX	XX
<i>Setaria adhaerens</i> (poaceae)	0	0	0	0	0	0	0	0	0	XXXX	0
<i>Setaria</i> spp. (Poaceae)	X	XX	XXXX	0	XX	XX	XXXX	XXXX	XXXX	XXXX	XXXX
<i>Sinapis</i> spp. (Brassicaceae)	XXX	0	XXXX	0	XXXX	XXXX	0	XXXX	0	X	XX
<i>Solanum nigrum</i> (Solanaceae)	XXX	XXXX	XXXX	XXXX	XXXX	0	0	XXXX	XXXX	XXXX	XXXX
<i>Sonchus</i> spp. (Asteraceae)	XX	0	XXX	XXXX	0	0	0	XXXX	0	XXXX	XX
<i>Sorghum halepense</i> (Poaceae)	0	0	0	0	X	0	XXXX	XXXX	XX	XXXX	XXXX
<i>Stellaria media</i> (Caryophyllaceae)	XXXX	XXXX	XXXX	0	XXXX	XXXX	0	XXXX	0	XX	XX
<i>Taraxacum officinale</i> (Asteraceae)	XX	0	0	0	0	0	0	XXXX	0	0	0
<i>Thlaspi arvense</i> (Brassicaceae)	XX	0	XX	0	XXXX	XXXX	0	XXXX	0	0	XX
<i>Tripleurospermum inodorum</i> (Asteraceae)	XXXX	XXXX	XXXX	0	XX	XXXX	0	XXXX	0	0	XX
<i>Verbascum phlomoides</i> (Scrophulariaceae)	0	0	0	0	0	0	0	XXXX	0	0	0
<i>Veronica</i> spp. (Scrophulariaceae)	XXXX	XXX	XXX	XXXX	XXXX	XXXX	0	XX	0	X	XX
<i>Viola</i> spp. (Violaceae)	XXXX	XXX	XXXX	XXXX	0	0	0	XX	0	0	0
<i>Xanthium</i> spp. (Asteraceae)	0	0	0	0	0	XX	XXX	XXXX	XXX	XXXX	XXX

**Table 3a.** Weed species listed in at least one of the countries. Sorted according to species name. (The table continues on the next pages).

<b>Species name</b>	<b>Species family</b>
<i>Abutilon theophrasti</i>	Malvaceae
<i>Acalypha virginica</i>	Euphorbiaceae
<i>Aethusa cynapium</i>	Apiaceae
<i>Alopecurus myosuroides</i>	Poaceae
<i>Amaranthus albus</i>	Amaranthaceae
<i>Amaranthus blitoides</i>	Amaranthaceae
<i>Amaranthus chlorostachys</i>	Amaranthaceae
<i>Amaranthus graecizans</i>	Amaranthaceae
<i>Amaranthus hybridus</i>	Amaranthaceae
<i>Amaranthus muricatus</i>	Amaranthaceae
<i>Amaranthus powellii</i>	Amaranthaceae
<i>Amaranthus retroflexus</i>	Amaranthaceae
<i>Amaranthus rudis</i>	Amaranthaceae
<i>Amaranthus viridis</i>	Amaranthaceae
<i>Ambrosia artemisiifolia</i>	Asteraceae
<i>Ammi majus</i>	Apiaceae
<i>Anagallis arvensis</i>	Primulaceae
<i>Anthemis arvensis</i>	Asteraceae
<i>Anthemis vulgaris</i>	Asteraceae
<i>Apera spica-venti</i>	Graminieae
<i>Arctium lapa</i>	Asteraceae
<i>Aristolochia clematidis</i>	Aristolochiaceae
<i>Artemisia vulgaris</i>	Asteraceae
<i>Asparagus officinalis</i>	Liliaceae
<i>Aster squamatus</i>	Asteraceae
<i>Atriplex patula</i>	Chenopodiaceae
<i>Atriplex prostrata</i>	Chenopodiaceae
<i>Avena fatua</i>	Poaceae
<i>Beta vulgaris</i>	Amaranthaceae
<i>Bidens frondosa</i>	Asteraceae
<i>Bidens tripartita</i>	Asteraceae
<i>Bifora radians</i>	Apiaceae
<i>Brachiaria eruciformis</i>	Poaceae
<i>Brassica nigra</i>	Brassicaceae
<i>Brassica rapa</i>	Brassicaceae
<i>Brassica napus</i>	Brassicaceae
<i>Calystegia sepium</i>	Convolvulaceae
<i>Cannabis ruderalis</i>	Cannabaceae
<i>Cannabis sativa</i>	Cannabaceae
<i>Capsella bursa-pastoris</i>	Brassicaceae
<i>Capsella rubella</i>	Brassicaceae
<i>Cardaria draba</i>	Brassicaceae
<i>Carduus acantoides</i>	Asteraceae
<i>Carduus nutans</i>	Asteraceae
<i>Caucalis daucoides</i>	Apiaceae
<i>Caucalis platycarpus</i>	Apiaceae
<i>Centaurea cyanus</i>	Asteraceae
<i>Chenopodium album</i>	Chenopodiaceae

<i>Chenopodium ficifolium</i>	Chenopodiaceae
<i>Chenopodium hybridum</i>	Chenopodiaceae
<i>Chenopodium opulifolium</i>	Chenopodiaceae
<i>Chenopodium polyspermum</i>	Chenopodiaceae
<i>Chenopodium vulvaria</i>	Chenopodiaceae
<i>Chrozophora tinctoria</i>	Euphorbiaceae
<i>Chrysanthemum segetum</i>	Asteraceae
<i>Cicorium inthybus</i>	Asteraceae
<i>Cirsium arvense</i>	Asteraceae
<i>Commelina</i> spp.	Commelinaceae
<i>Conium maculatum</i>	Apiaceae
<i>Consolida regalis</i>	Ranunculaceae
<i>Convolvulus arvensis</i>	Convolvulaceae
<i>Conyza bonariensis</i>	Asteraceae
<i>Conyza canadensis</i>	Asteraceae
<i>Conyza sumatrensis</i>	Asteraceae
<i>Coronopus didymus</i>	Brassicaceae
<i>Coronopus squamatus</i>	Brassicaceae
<i>Cuscuta campestris</i>	Cuscutaceae
<i>Cynodon dactylon</i>	Poaceae
<i>Cyperus rotundus</i>	Cyperaceae
<i>Datura stramonium</i>	Solanaceae
<i>Descurainia sophia</i>	Brassicaceae
<i>Digitaria ischaemum</i>	Poaceae
<i>Digitaria sanguinalis</i>	Poaceae
<i>Diplotaxis virgata</i>	Brassicaceae
<i>Draba verna</i>	Brassicaceae
<i>Ecballium elaterium</i>	Cucurbitaceae
<i>Echinochloa crus-galli</i>	Poaceae
<i>Echinochloa colonum</i>	Poaceae
<i>Eclipta prostrata</i>	Asteraceae
<i>Eleusine indica</i>	Poaceae
<i>Elymus repens</i>	Poaceae
<i>Equisetum arvense</i>	Equisetaceae
<i>Equisetum ramosissimum</i>	Equisetaceae
<i>Eragrostis barrelieri</i>	Poaceae
<i>Eragrostis virescens</i>	Poaceae
<i>Erigeron canadensis</i>	Asteraceae
<i>Erodium cicutarium</i>	Geraniaceae
<i>Euphorbia cyparissias</i>	Euphorbiaceae
<i>Euphorbia exigua</i>	Euphorbiaceae
<i>Euphorbia helioscopia</i>	Euphorbiaceae
<i>Euphorbia nutans</i>	Euphorbiaceae
<i>Euphorbia virgata</i>	Euphorbiaceae
<i>Fumaria officinalis</i>	Fumariaceae
<i>Fumaria parviflora</i>	Fumariaceae
<i>Fumaria schleicheri</i>	Fumariaceae
<i>Galeopsis tetrahit</i>	Lamiaceae
<i>Galinsoga ciliata</i>	Asteraceae
<i>Galinsoga parviflora</i>	Asteraceae
<i>Galium aparine</i>	Rubiaceae

<i>Galium tricornutum</i>	Rubiaceae
<i>Geranium</i> spp.	Geraniaceae
<i>Gnaphalium uliginosum</i>	Asteraceae
<i>Helianthus annuus</i>	Asteraceae
<i>Helianthus tuberosus</i>	Asteraceae
<i>Heliotropium europaeum</i>	Boraginaceae
<i>Hibiscus trionum</i>	Malvaceae
<i>Humulus lupulus</i>	Cannabaceae
<i>Hyoscyamus niger</i>	Solanaceae
<i>Iva xanthiifolia</i>	Asteraceae
<i>Kickxia lanigera</i>	Scrophulariaceae
<i>Kickxia spurea</i>	Scrophulariaceae
<i>Kochia scoparia</i>	Chenopodiaceae
<i>Lactuca serriola</i>	Asteraceae
<i>Lamium album</i>	Lamiaceae
<i>Lamium amplexicaule</i>	Lamiaceae
<i>Lamium purpureum</i>	Lamiaceae
<i>Lathyrus tuberosus</i>	Fabaceae
<i>Linaria vulgaris</i>	Scrophulariaceae
<i>Lithospermum arvense</i>	Boraginaceae
<i>Lolium</i> spp.	Poaceae
<i>Malva parviflora</i>	Malvaceae
<i>Malva sylvestris</i>	Malvaceae
<i>Matricaria chamomilla</i>	Asteraceae
<i>Melilotus albus</i>	Fabaceae
<i>Mercurialis annua</i>	Euphorbiaceae
<i>Myosotis arvensis</i>	Boraginaceae
<i>Onopordon acantium</i>	Asteraceae
<i>Oxalis latifolia</i>	Oxalidaceae
<i>Panicum dichotomiflorum</i>	Poaceae
<i>Panicum miliaceum</i>	Poaceae
<i>Papaver rhoeas</i>	Papaveraceae
<i>Paspalum paspalodes</i>	Poaceae
<i>Phalaris brachystachys</i>	Poaceae
<i>Phalaris coerulescens</i>	Poaceae
<i>Phalaris minor</i>	Poaceae
<i>Phalaris paradoxa</i>	Poaceae
<i>Phragmites australis</i>	Poaceae
<i>Phragmites communis</i>	Poaceae
<i>Phytolacca americana</i>	Phytolaccaceae
<i>Picris echioides</i>	Asteraceae
<i>Piptatherum miliaceum</i>	Poaceae
<i>Plantago lanceolata</i>	Plantaginaceae
<i>Plantago major</i>	Plantaginaceae
<i>Plantago media</i>	Plantaginaceae
<i>Poa annua</i>	Poaceae
<i>Poa trivialis</i>	Poaceae
<i>Polygonum amphibium</i>	Polygonaceae
<i>Polygonum aviculare</i>	Polygonaceae
<i>Polygonum convolvulus</i>	Polygonaceae
<i>Polygonum hydropiper</i>	Polygonaceae

<i>Polygonum lapathifolium</i>	Polygonaceae
<i>Polygonum persicaria</i>	Polygonaceae
<i>Portulaca oleracea</i>	Portulacaceae
<i>Pulicaria paludosa</i>	Asteraceae
<i>Ranunculus acer</i>	Ranunculaceae
<i>Ranunculus arvensis</i>	Ranunculaceae
<i>Ranunculus repens</i>	Ranunculaceae
<i>Raphanus raphanistrum</i>	Brassicaceae
<i>Reseda lutea</i>	Resedaceae
<i>Ridolfia segetum</i>	Apiaceae
<i>Rubus caesius</i>	Rosaceae
<i>Rumex acetosella</i>	Polygonaceae
<i>Rumex crispus</i>	Polygonaceae
<i>Rumex obtusifolius</i>	Polygonaceae
<i>Rumex pulcher</i>	Polygonaceae
<i>Salsola kali</i>	Chenopodiaceae
<i>Sambucus ebulus</i>	Caprifoliaceae
<i>Senecio vernalis</i>	Asteraceae
<i>Senecio vulgaris</i>	Asteraceae
<i>Setaria adhaerens</i>	Poaceae
<i>Setaria glauca</i>	Poaceae
<i>Setaria pumila</i>	Poaceae
<i>Setaria verticillata</i>	Poaceae
<i>Setaria viridis</i>	Poaceae
<i>Silybum marianum</i>	Asteraceae
<i>Silene noctiflora</i>	Caryophyllaceae
<i>Sinapis alba</i>	Brassicaceae
<i>Sinapis arvensis</i>	Brassicaceae
<i>Solanum nigrum</i>	Solanaceae
<i>Solanum physalifolium</i>	Solanaceae
<i>Sonchus arvensis</i>	Asteraceae
<i>Sonchus asper</i>	Asteraceae
<i>Sonchus oleraceus</i>	Asteraceae
<i>Sorghum halepense</i>	Poaceae
<i>Spergula arvensis</i>	Caryophyllaceae
<i>Stellaria media</i>	Caryophyllaceae
<i>Taraxacum officinale</i>	Asteraceae
<i>Thlaspi arvense</i>	Brassicaceae
<i>Tribulus terrestris</i>	Zygophyllaceae
<i>Tussilago farfara</i>	Asteraceae
<i>Urtica dioica</i>	Urticaceae
<i>Urtica urens</i>	Urticaceae
<i>Verbascum phlomoides</i>	Scrophulariaceae
<i>Verbena officinalis</i>	Verbenaceae
<i>Veronica agrestis</i>	Scrophulariaceae
<i>Veronica arvensis</i>	Scrophulariaceae
<i>Veronica hederifolia</i>	Scrophulariaceae
<i>Veronica persica</i>	Scrophulariaceae
<i>Viola arvensis</i>	Violaceae
<i>Viola tricolor</i>	Violaceae
<i>Xanthium albinum</i>	Asteraceae



<i>Xanthium italicum</i>	Asteraceae
<i>Xanthium spinosum</i>	Asteraceae
<i>Xanthium strumarium</i>	Asteraceae

Table 3b. Weed species listed in at least one of the countries. Sorted according to family name. (The table continues on the next pages).

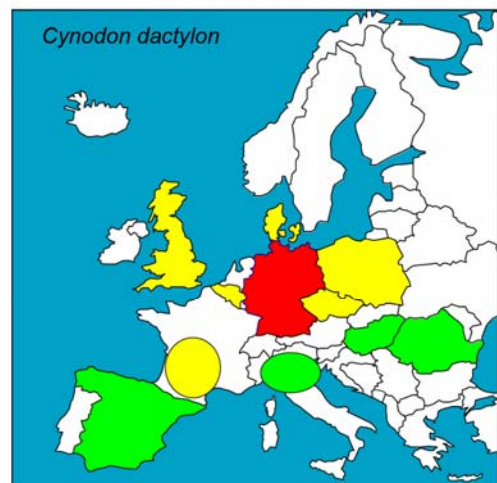
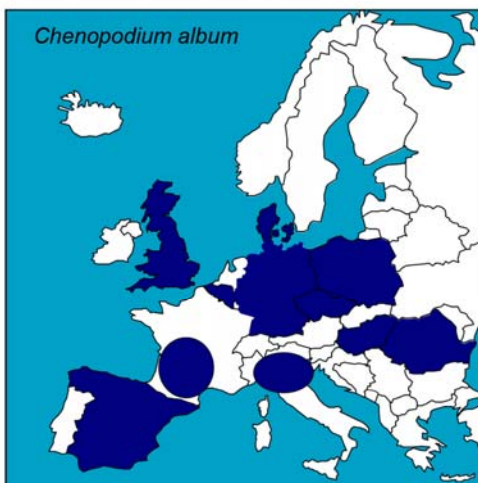
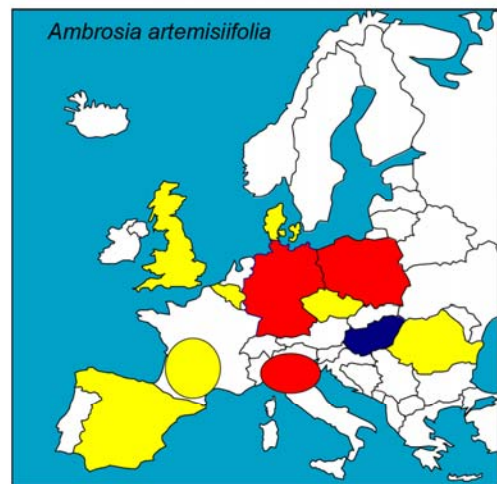
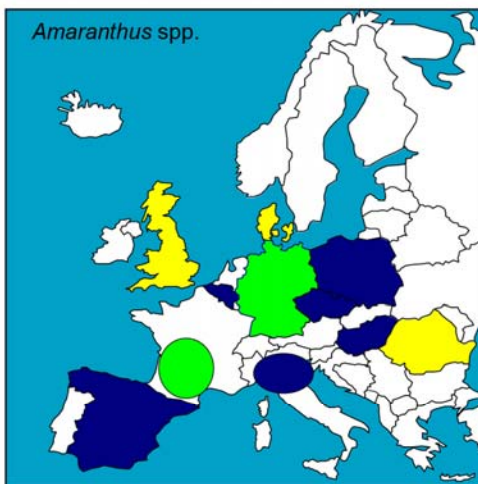
Species name	Species family
<i>Amaranthus albus</i>	Amaranthaceae
<i>Amaranthus blitoides</i>	Amaranthaceae
<i>Amaranthus chlorostachys</i>	Amaranthaceae
<i>Amaranthus graecizans</i>	Amaranthaceae
<i>Amaranthus hybridus</i>	Amaranthaceae
<i>Amaranthus muriciatus</i>	Amaranthaceae
<i>Amaranthus powellii</i>	Amaranthaceae
<i>Amaranthus retroflexus</i>	Amaranthaceae
<i>Amaranthus rudis</i>	Amaranthaceae
<i>Amaranthus viridis</i>	Amaranthaceae
<i>Beta vulgaris</i>	Amaranthaceae
<i>Aethusa cynapium</i>	Apiaceae
<i>Ammi majus</i>	Apiaceae
<i>Bifora radians</i>	Apiaceae
<i>Caucalis daucoides</i>	Apiaceae
<i>Caucalis platycarpus</i>	Apiaceae
<i>Conium maculatum</i>	Apiaceae
<i>Ridolfia segetum</i>	Apiaceae
<i>Aristolochia clematidis</i>	Aristolochiaceae
<i>Ambrosia artemisiifolia</i>	Asteraceae
<i>Anthemis arvensis</i>	Asteraceae
<i>Anthemis vulgaris</i>	Asteraceae
<i>Arctium lapa</i>	Asteraceae
<i>Artemisia vulgaris</i>	Asteraceae
<i>Aster squamatus</i>	Asteraceae
<i>Bidens frondosa</i>	Asteraceae
<i>Bidens tripartita</i>	Asteraceae
<i>Carduus acantoides</i>	Asteraceae
<i>Carduus nutans</i>	Asteraceae
<i>Centaurea cyanus</i>	Asteraceae
<i>Chrysanthemum segetum</i>	Asteraceae
<i>Cicorium inthybus</i>	Asteraceae
<i>Cirsium arvense</i>	Asteraceae
<i>Conyza bonariensis</i>	Asteraceae
<i>Conyza canadensis</i>	Asteraceae
<i>Conyza sumatrensis</i>	Asteraceae
<i>Eclipta prostrata</i>	Asteraceae
<i>Erigeron canadiensis</i>	Asteraceae
<i>Galinsoga ciliata</i>	Asteraceae
<i>Galinsoga parviflora</i>	Asteraceae
<i>Gnaphalium uliginosum</i>	Asteraceae
<i>Helianthus annuus</i>	Asteraceae
<i>Helianthus tuberosus</i>	Asteraceae
<i>Iva xanthiifolia</i>	Asteraceae

<i>Lactuca serriola</i>	Asteraceae
<i>Matricaria chamomilla</i>	Asteraceae
<i>Onopordon acantium</i>	Asteraceae
<i>Picris echioides</i>	Asteraceae
<i>Pulicaria paludosa</i>	Asteraceae
<i>Senecio vernalis</i>	Asteraceae
<i>Senecio vulgaris</i>	Asteraceae
<i>Silybum marianum</i>	Asteraceae
<i>Sonchus arvensis</i>	Asteraceae
<i>Sonchus asper</i>	Asteraceae
<i>Sonchus oleraceus</i>	Asteraceae
<i>Taraxacum officinale</i>	Asteraceae
<i>Tussilago farfara</i>	Asteraceae
<i>Xanthium albinum</i>	Asteraceae
<i>Xanthium italicum</i>	Asteraceae
<i>Xanthium spinosum</i>	Asteraceae
<i>Xanthium strumarium</i>	Asteraceae
<i>Heliotropium europaeum</i>	Boraginaceae
<i>Lithospermum arvense</i>	Boraginaceae
<i>Myosotis arvensis</i>	Boraginaceae
<i>Brassica nigra</i>	Brassicaceae
<i>Brassica rapa</i>	Brassicaceae
<i>Brassica napus</i>	Brassicaceae
<i>Capsella bursa-pastoris</i>	Brassicaceae
<i>Capsella rubella</i>	Brassicaceae
<i>Cardaria draba</i>	Brassicaceae
<i>Coronopus didymus</i>	Brassicaceae
<i>Coronopus squamatus</i>	Brassicaceae
<i>Descurainia sophia</i>	Brassicaceae
<i>Diplotaxis virgata</i>	Brassicaceae
<i>Draba verna</i>	Brassicaceae
<i>Raphanus raphanistrum</i>	Brassicaceae
<i>Sinapis alba</i>	Brassicaceae
<i>Sinapis arvensis</i>	Brassicaceae
<i>Thlaspi arvense</i>	Brassicaceae
<i>Cannabis ruderalis</i>	Cannabaceae
<i>Cannabis sativa</i>	Cannabaceae
<i>Humulus lupulus</i>	Cannabaceae
<i>Sambucus ebulus</i>	Caprifoliaceae
<i>Silene noctiflora</i>	Caryophyllaceae
<i>Spergula arvensis</i>	Caryophyllaceae
<i>Stellaria media</i>	Caryophyllaceae
<i>Atriplex patula</i>	Chenopodiaceae
<i>Atriplex prostrata</i>	Chenopodiaceae
<i>Chenopodium album</i>	Chenopodiaceae
<i>Chenopodium ficifolium</i>	Chenopodiaceae
<i>Chenopodium hybridum</i>	Chenopodiaceae
<i>Chenopodium opulifolium</i>	Chenopodiaceae
<i>Chenopodium polyspermum</i>	Chenopodiaceae
<i>Chenopodium vulvaria</i>	Chenopodiaceae
<i>Kochia scoparia</i>	Chenopodiaceae

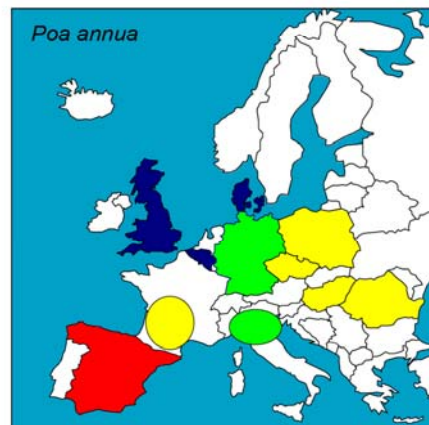
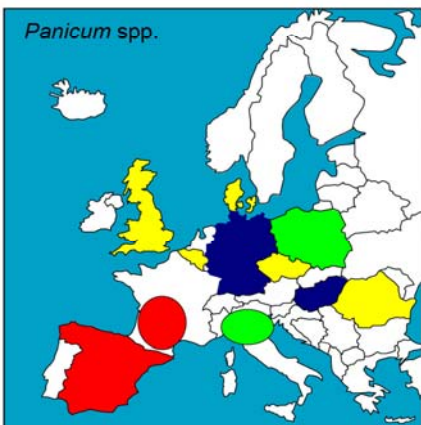
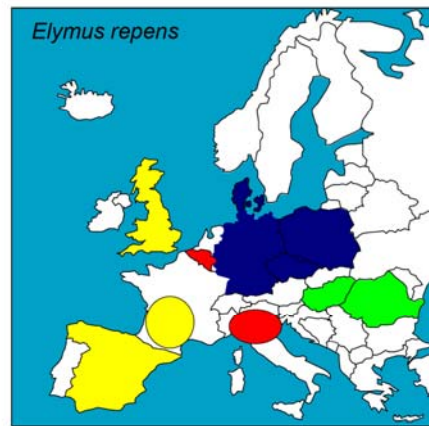
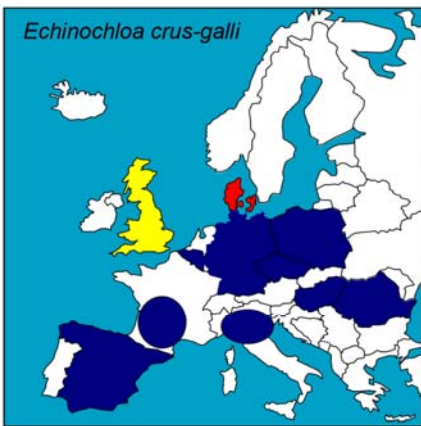
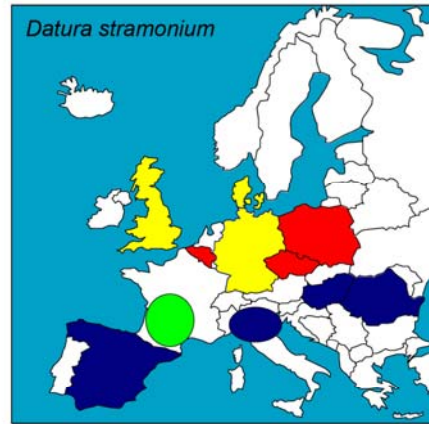
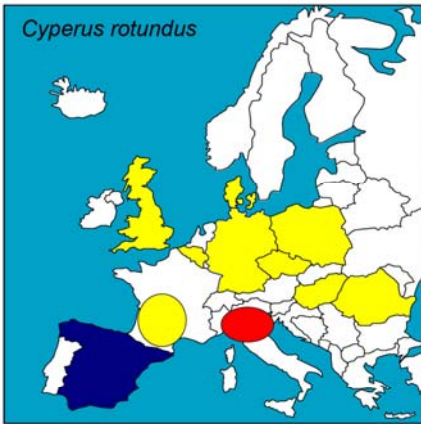
<i>Salsola kali</i>	Chenopodiaceae
<i>Commelina</i> spp.	Commelinaceae
<i>Calystegia sepium</i>	Convolvulaceae
<i>Convolvulus arvensis</i>	Convolvulaceae
<i>Echallium elaterium</i>	Cucurbitaceae
<i>Cuscuta campestris</i>	Cuscutaceae
<i>Cyperus rotundus</i>	Cyperaceae
<i>Equisetum arvense</i>	Equisetaceae
<i>Equisetum ramosissimum</i>	Equisetaceae
<i>Acalypha virginica</i>	Euphorbiaceae
<i>Chrozophora tinctoria</i>	Euphorbiaceae
<i>Euphorbia cyparissias</i>	Euphorbiaceae
<i>Euphorbia exigua</i>	Euphorbiaceae
<i>Euphorbia helioscopia</i>	Euphorbiaceae
<i>Euphorbia nutans</i>	Euphorbiaceae
<i>Euphorbia virgata</i>	Euphorbiaceae
<i>Mercurialis annua</i>	Euphorbiaceae
<i>Lathyrus tuberosus</i>	Fabaceae
<i>Melilotus albus</i>	Fabaceae
<i>Fumaria officinalis</i>	Fumariaceae
<i>Fumaria parviflora</i>	Fumariaceae
<i>Fumaria schleicheri</i>	Fumariaceae
<i>Erodium cicutarium</i>	Geraniaceae
<i>Geranium</i> spp.	Geraniaceae
<i>Apera spica-venti</i>	Graminieae
<i>Galeopsis tetrahit</i>	Lamiaceae
<i>Lamium album</i>	Lamiaceae
<i>Lamium amplexicaule</i>	Lamiaceae
<i>Lamium purpureum</i>	Lamiaceae
<i>Asparagus officinalis</i>	Liliaceae
<i>Abutilon theophrasti</i>	Malvaceae
<i>Hibiscus trionum</i>	Malvaceae
<i>Malva parviflora</i>	Malvaceae
<i>Malva sylvestris</i>	Malvaceae
<i>Oxalis latifolia</i>	Oxalidaceae
<i>Papaver rhoeas</i>	Papaveraceae
<i>Phytolacca americana</i>	Phytolaccaceae
<i>Plantago lanceolata</i>	Plantaginaceae
<i>Plantago major</i>	Plantaginaceae
<i>Plantago media</i>	Plantaginaceae
<i>Alopecurus myosuroides</i>	Poaceae
<i>Avena fatua</i>	Poaceae
<i>Brachiaria eruciformis</i>	Poaceae
<i>Cynodon dactylon</i>	Poaceae
<i>Digitaria ischaemum</i>	Poaceae
<i>Digitaria sanguinalis</i>	Poaceae
<i>Echinochloa crus-galli</i>	Poaceae
<i>Echinochloa colonum</i>	Poaceae
<i>Eleusine indica</i>	Poaceae
<i>Elymus repens</i>	Poaceae
<i>Eragrostis barrelieri</i>	Poaceae

<i>Eragrostis virescens</i>	Poaceae
<i>Lolium</i> spp.	Poaceae
<i>Panicum dichotomiflorum</i>	Poaceae
<i>Panicum miliaceum</i>	Poaceae
<i>Paspalum paspalodes</i>	Poaceae
<i>Phalaris brachystachys</i>	Poaceae
<i>Phalaris coerulescens</i>	Poaceae
<i>Phalaris minor</i>	Poaceae
<i>Phalaris paradoxa</i>	Poaceae
<i>Phragmites australis</i>	Poaceae
<i>Phragmites communis</i>	Poaceae
<i>Piptatherum miliaceum</i>	Poaceae
<i>Poa annua</i>	Poaceae
<i>Poa trivialis</i>	Poaceae
<i>Setaria adhaerens</i>	Poaceae
<i>Setaria glauca</i>	Poaceae
<i>Setaria pumila</i>	Poaceae
<i>Setaria verticillata</i>	Poaceae
<i>Setaria viridis</i>	Poaceae
<i>Sorghum halepense</i>	Poaceae
<i>Polygonum amphibium</i>	Polygonaceae
<i>Polygonum aviculare</i>	Polygonaceae
<i>Polygonum convolvulus</i>	Polygonaceae
<i>Polygonum hydropiper</i>	Polygonaceae
<i>Polygonum lapathifolium</i>	Polygonaceae
<i>Polygonum persicaria</i>	Polygonaceae
<i>Rumex acetosella</i>	Polygonaceae
<i>Rumex crispus</i>	Polygonaceae
<i>Rumex obtusifolius</i>	Polygonaceae
<i>Rumex pulcher</i>	Polygonaceae
<i>Portulaca oleracea</i>	Portulacaceae
<i>Anagallis arvensis</i>	Primulaceae
<i>Consolida regalis</i>	Ranunculaceae
<i>Ranunculus acer</i>	Ranunculaceae
<i>Ranunculus arvensis</i>	Ranunculaceae
<i>Ranunculus repens</i>	Ranunculaceae
<i>Reseda lutea</i>	Resedaceae
<i>Rubus caesius</i>	Rosaceae
<i>Galium aparine</i>	Rubiaceae
<i>Galium tricorutum</i>	Rubiaceae
<i>Kickxia lanigera</i>	Scrophulariaceae
<i>Kickxia spurea</i>	Scrophulariaceae
<i>Linaria vulgaris</i>	Scrophulariaceae
<i>Verbascum phlomoides</i>	Scrophulariaceae
<i>Veronica agrestis</i>	Scrophulariaceae
<i>Veronica arvensis</i>	Scrophulariaceae
<i>Veronica hederifolia</i>	Scrophulariaceae
<i>Veronica persica</i>	Scrophulariaceae
<i>Datura stramonium</i>	Solanaceae
<i>Hyoscyamus niger</i>	Solanaceae
<i>Solanum nigrum</i>	Solanaceae

<i>Solanum physalifolium</i>	Solanaceae
<i>Urtica dioica</i>	Urticaceae
<i>Urtica urens</i>	Urticaceae
<i>Verbena officinalis</i>	Verbenaceae
<i>Viola arvensis</i>	Violaceae
<i>Viola tricolor</i>	Violaceae
<i>Tribulus terrestris</i>	Zygophyllaceae

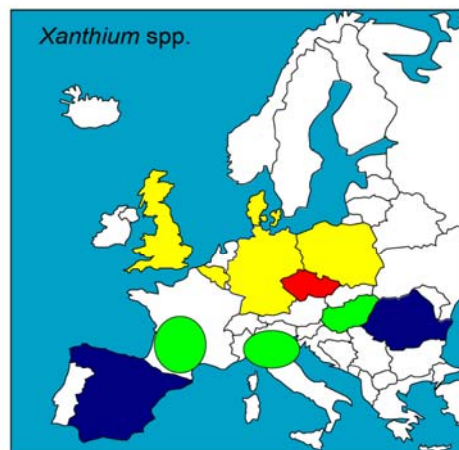
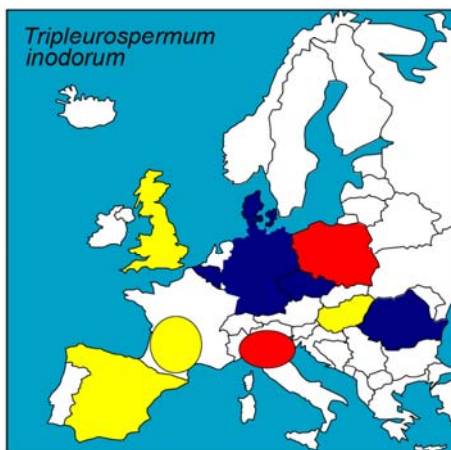
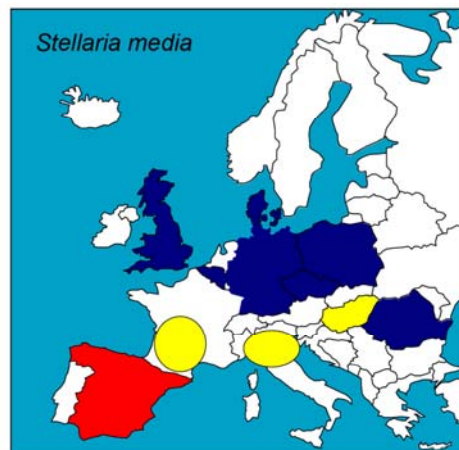
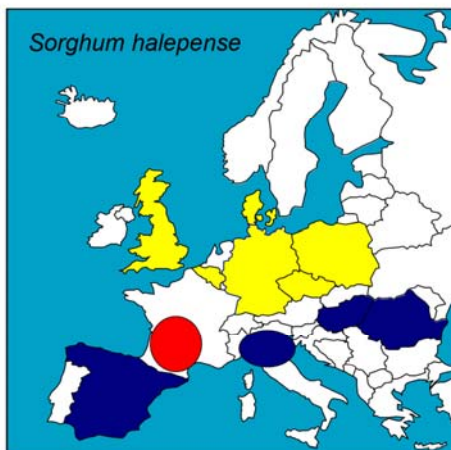
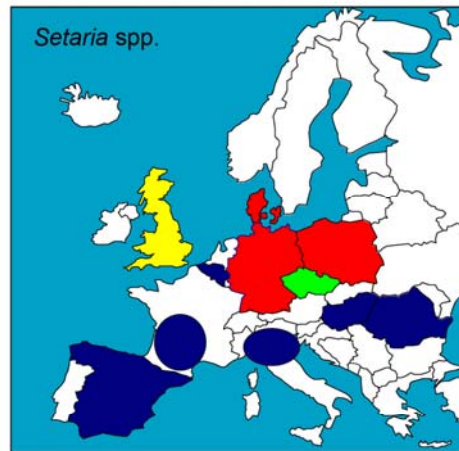
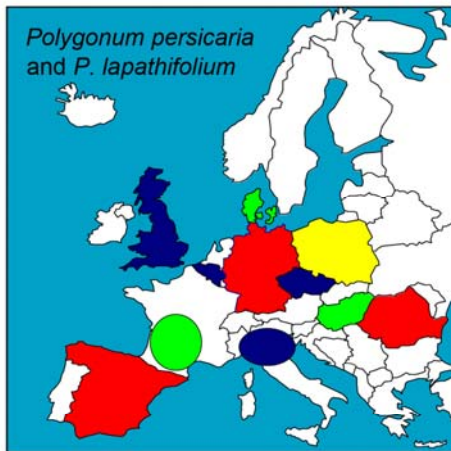


**Figure 1.** Frequency of weeds in maize in Europe. Blue = very common, green = common, red = less common/rare, yellow = very rare/absent or missing information, white = no info gathered.



**Figure 2.** Frequency of weeds in maize in Europe. Blue = very common, green = common, red = less common/rare, yellow = very rare/absent or missing information, white = no info gathered.





**Figure 3.** Frequency of weeds in maize in Europe. Blue = very common, green = common, red = less common/rare, yellow = very rare/absent or missing information, white = no info gathered.

## 4 SUMMARY

A survey of weeds in European maize crops was carried out. The survey was based on the response to a questionnaire sent to maize specialists in 11 countries asking for information about weed occurrence in maize crops before weed control is carried out. The contribution could be in the form of 1) a recently performed survey of weeds in maize, 2) an expert evaluation of the occurrence and frequency of weeds in maize crops classified in three categories (very common, common and less common/rare), 3) a list of weed occurrence and frequency based on weed control experiments or 4) a combination of the previous mentioned methods.

Input was obtained from all contacted experts representing Belgium, the Czech Republic, Denmark, France, Germany, Hungary, Italy, Poland, Romania, Spain (north and south) and the UK. Making use of information originating from various sources the present survey will inevitably be more heterogeneous than a survey based on a unique method. However, we believe that the survey gives a good overview of the distribution and incidence of weeds in maize cropping.

In the present survey a total of 203 different weed species were reported, of which 61 weed species were reported as being "Very common" in at least one country. A table showing frequency of these 61 species in all 11 countries is included. The report further includes frequency maps of 16 important weed species.



## 5 REFERENCES

- Meissle M. *et al.* 2010. Pests, pesticide use and alternative options in European maize production: Current status and future prospects. *Journal of Applied Entomology* **134**. 357-375.
- Novak R., Dancza I., Szentey L. & Karaman J. 2009. Arable weeds of Hungary. Fifth national weed survey (2008-2008). Ministry of Agriculture and Rural development, Budapest (Hungary) 2009.

### 5.1 Annex 1

Survey of weeds in maize in various European countries:

- Belgium (Page 26)
- Czech Republic (Page 27)
- Denmark (Page 28)
- France (Page 29)
- Germany (Page 30)
- Hungary (Page 31)
- Italy (Pages 32-33)
- Poland (Pages 34-36)
- Romania (Pages 37-39)
- Spain (Pages 40-43)
- United Kingdom (Page 44)

### Survey of weeds in maize

**Region: Belgium**

**Contact person: Guy Foucart**

#### Weed species reported in maize

Very common	Common	Less common/rare
ECHCG SETVE SETVI POAAN ALOMY	DIGIS DIGSA	AVEFA APESV AGRRE
ATXPA CAPBP CHEAL GASCI MATCH MERAN SOLNI STEME VIOAR POLCO POLAV POLPE POLLA SINAR SENVU	AMARE FUMOF GALAP SONAR LAMPU ANGAR MYOAR RAPRA VERHE VERPE VERAR GERAN LOLZZ  CAGSE CIRAR	AETCY PAPRH EPHHE LAPCO LINVU URTDI GAETE DATST THLAR SPRAR ANTAR CHYSE URTUR GNAUL  CONAR EQUAR POLAM RUMZZ RANAR TUSFA BETVU

## Survey of weeds in maize

**Region: Czech Republic**

**Contact person: Josef Soukup**

### Weed species reported in maize

Very common	Common	Less common/rare
<p><b>Everywhere</b>  <i>Chenopodium album</i>  <i>Agropyron repens- perennial</i>  <i>Polygonum lapathifolium</i>  <i>Matricaria inodorum</i>  <i>Stellaria media</i>  <i>Thlaspi arvense</i>  <i>Veronica persica</i>  <i>Polygonum convolvulus</i>                      volunteer OSR  <i>Fumaria officinalis</i>  <i>Galium aparine</i></p>	<p><i>Cirsium arvense -perennial</i>  <i>Polygonum aviculare</i>  <i>Polygonum persicaria</i>  <i>Capsella bursa-pastoris</i>  <i>Viola arvensis</i>  <i>Raphanus raphanistrum</i>  <i>Rumex obtusifolius- perennial</i></p>	<p><i>Myosotis arvensis</i>  <i>Rumex crispus – perennial</i>  <i>Artemisia vulgaris – perennial</i>  <i>Anthemis vulgaris</i></p>
<p><b>In warmer regions (avg year temperature <math>\geq 8.5^{\circ}\text{C}</math>)</b>  <i>Echinochloa crus-gali</i>  <i>Amaranthus retroflexus</i>  <i>Amaranthus Powellii</i>  <i>Sinapis alba</i>                      vulunteer sunflower</p>	<p><i>Setaria pumila</i>  <i>Setaria verticiliata</i>  <i>Mercurialis annua</i>  <i>Lamium album</i>  <i>Lamium amplexicaule</i>  <i>Solanum nigrum</i>  <i>Anagalis arvensis</i>  <i>Chenopodium hybridum</i>  <i>Aethusa cynapium</i>  <i>Convolvulus arvensis – perennial</i>  <i>Avena fatua</i></p>	<p><i>Digitaria sanguinalis</i>  <i>Abutilon Theophrasti</i>  <i>Kochia scoparia</i>  <i>Setaria viridis</i>  <i>Canabis ruderalis</i>  <i>Xanthium albinum</i>  <i>Xanthium strumarium</i>  <i>Solanum physalifolium</i>  <i>Chenopodium ficifolium</i>  <i>Conium maculatum</i>  <i>Iva xanthiifolia</i>  <i>Hyoscyamus niger</i>  <i>Datura stramonium</i></p>

## Survey of weeds in maize

**Region: Denmark**

**Contact person: Peter Kryger Jensen**

No experiments with species	
Total no. of experiments	64
<i>Polygonum concolvulus</i>	55
<i>Chenopodium album</i>	51
Monocotyledon spp*	49
<i>Viola</i> spp.	43
<i>Veronica</i> spp	37
<i>Tripleuros inodorum</i>	32
<i>Geranium</i> spp	28
<i>Stellaria media</i>	20
<i>Polygonum aviculare</i>	20
<i>Lamium</i> spp	16
<i>Capsella Bursa-pastoris</i>	14
<i>Brassica</i> spp	13
<i>Polygonum persicaria</i>	11
<i>Myosotis arvensis</i>	7
<i>Senecio</i> spp	7
<i>Solanum nigrum</i>	7
<i>Galium aparine</i>	6
<i>Silene noctiflora</i>	5
<i>Thlaspi arvense</i>	5
<i>Urtica urens</i>	4
<i>Euphorbia</i> spp	3
<i>Galeopsis</i> spp	2
<i>Polygonum lapathifolium</i>	1
<i>Sonchus arvensis</i>	1
<i>Cirsium arvense</i>	1
<i>Centaurea cyanus</i>	1
<i>Fumaria officinalis</i>	1
* Primarily <i>Poa annua</i>	0

## Survey of weeds in maize

Region: Southwestern France

Contact person: Valérie BIBARD

### Weed species reported in maize

Very common	Common	Less common/rare
<i>Chenopodium album</i> Chenopode blanc	<i>Datura stramonium</i> Datura stramoine	<i>Panicum miliaceum</i> Panic Faux Millet
<i>Echinochloa crus-galli</i> Panic pied de coq	<i>Mercurialis annua</i> Mercuriale annuelle	<i>Chenopodium polyspermum</i> Chenopode polysperme
<i>Calystegia sepium</i> Liseron des haies	<i>Polygonum persicaria</i> Renouee persicaire	<i>Abutilon theophrasti</i> Abutilon de Theophraste
<i>Digitaria sanguinea</i> Digitaire sanguine	<i>Amaranthus</i> sp Amarante sp	<i>Sorghum alepense</i> Sorgho d'Alep
<i>Solanum nigrum</i> Morelle noire	<i>Xanthium strumarium</i> Lampourde à gros fruits	<i>Polygonum lapathifolium</i> Renouee a feuilles de patience
<i>Setaria</i> sp Setaire glauque		<i>Portulaca oleracea</i> Pourpier maraicher
		<i>Kickxia</i> sp Linaire sp
		<i>Anagallis arvensis</i> Mouron des champs
		<i>Phytolacca americana</i> Phytolaque

## Survey of weeds in maize

**Region: Germany**

**Contact person: Wolfgang Voegler**

Species	Latin	English	Frequency*
Hirse allg.	<i>Panicum</i> spp.	Millet	Very common
Melde, Gemeine	<i>Atriplex patula</i>	Common orache	Very common
Kamille allg.	<i>Matricaria</i> spp.	Chamomille	Very common
Knöterich allg.	<i>Fallopia</i> spp.	Bindweed	Very common
Quecke, Gemeine	<i>Agropyron repens</i>	Couchgrass	Very common
Klettenlabkraut	<i>Galium aparine</i>	Cleavers	Very common
Vogelmiere	<i>Stellaria media</i>	Common chickweed	Very common
Nachtschatten, schwarzer	<i>Solanum nigrum</i>	Black nightshade	Very common
Gänsefuß, weißer	<i>Chenopodium album</i>	"Chenopodium album"	Very common
Ackerfuchsschwanzgras	<i>Alopecurus myosuroides</i>	Blackgrass	Very common
Hühnerhirse, Gemeine	<i>Echinochloa crus-galli</i>	"Echinochloa crus-galli"	Very common
Rispengras, einjähr.	<i>Poa trivialis</i>	Rough meadow grass	Very common
Ackerwinde	<i>Convolvulus arvensis</i>	Cornbine	Common
Ackerkratzdistel	<i>Cirsium arvense</i>	Perennial thistle	Common
Ehrenpreis, Acker-	<i>Veronica agrestis</i>	Field speedwell	Common
Franzosenkraut, kleinblütig	<i>Galinsoga parviflora</i>	Gallant soldier	Common
Windhalm, Gemeiner	<i>Apera spica-venti</i>	Windgrass	Common
Knöterich, Winden-	<i>Fallopia convolvulus</i>	black bindweed	Common
Durchwuchs (Raps)	<i>Brassica napus</i>	Canola	Common
Stiefmütterchen, Acker-	<i>Viola arvensis</i>	Field pansy	Common
Ampfer allg.	<i>Rumex</i> spp.	Dock	Common
Fuchsschwanz allg.	<i>Amaranth</i> spp.	Amaranth	Common
Hafer, Flug-	<i>Avena fatua</i>	Wild oat	Common
Hirtentäschel	<i>Capsella bursa-pastoris</i>		Less common
Taubnessel allg.	<i>Lamium</i> spp.		Less common
Storchnabel allg.	<i>Geranium</i> spp.		Less common
Knöterich, Vogel-	<i>Polygonum aviculare</i>		Less common
Gänsefuß allg.	<i>Chenopodium ficifolium</i>		Less common
Kornblume	<i>Centaurea cyanus</i>		Less common
Hohlzahn, gemeiner	<i>Galeopsis</i> spp.		Less common
Weidelgras, steifes	<i>Lolium rigidum</i>		Less common
Nachtschatten allg.	<i>Solanum</i> spp.		Less common
Knöterich, Floh-	<i>Polygonum persicaria</i>		Less common
Distel allg.	<i>Cirsium</i> spp.		Less common
Kreuzkraut, Gemeines	<i>Senecio vulgaris</i>		Less common
Borstenhirse allg.	<i>Setaria</i> spp.		Less common
Rauke allg.	<i>Sisymbrium</i> spp.		Less common
Kamille, echte	<i>Matricaria chamomilla</i>		Less common

\*frequency was evaluated by the author of this report

Survey of weeds in maize

**Table 8:** The most important weeds of maize in the order of dominance in early summer (2007-2008)

English name of the weeds	Latin name of the weeds	1964		1969-71		1987-88		1996-97		2007-2008	
		OD	Cover %	OD	Cover %	OD	Cover %	OD	Cover %	OD	Cover %
Barnyardgrass	<i>Echinochloa crus-galli</i> (L.) P.B.	2	2,3720	1	5,7568	1	6,3583	1	5,2732	1	6,6614
Common ragweed	<i>Ambrosia artemisiifolia</i> L.	15	0,4000	10	0,7432	4	2,4879	3	3,9022	2	5,4000
Lambsquarters	<i>Chenopodium album</i> L.	4	1,4760	2	2,9262	3	3,4547	4	3,1692	3	5,1918
Redroot pigweed	<i>Amaranthus retroflexus</i> L.	11	0,7030	3	2,4936	2	3,8011	2	5,2214	4	2,1753
Yellow foxtail	<i>Setaria pumila</i> (Poir.) R. et Sch. ( <i>S. glauca</i> )	7	1,1150	6	1,2168	7	0,8192	16	0,5439	5	1,8137
Canada thistle	<i>Cirsium arvense</i> (L.) Scop.	5	1,4590	7	1,1184	9	0,7120	5	1,4937	6	1,5281
Common millet	<i>Panicum miliaceum</i> L.	23	0,1750	230	0,0006	17	0,3949	12	0,6958	7	1,4452
Jimson weed	<i>Datura stramonium</i> L.	74	0,0100	27	0,1368	13	0,4822	7	1,2229	8	1,3927
Green amaranth	<i>Amaranthus chlorostachys</i> Willd.	108	0,0020	24	0,1471	10	0,6315	8	1,1185	9	1,3685
Field bindweed	<i>Convolvulus arvensis</i> L.	1	5,0090	4	2,2948	5	2,2742	6	1,4874	10	1,3238
Johnsongrass	<i>Sorghum halepense</i> (L.) Pers.			89	0,0109	19	0,3643	10	0,7850	11	1,0688
Quackgrass	<i>Elymus (Agropyron or Elytrigia) repens</i> (L.) Gould	12	0,6940	9	0,8788	12	0,4894	9	0,7875	12	0,9343
Sunflower	<i>Helianthus annuus</i> L.			92	0,0089	21	0,2912	17	0,4009	13	0,8945
Curlytop knotweed	<i>Persicaria lapathifolia</i> (L.) S. F. Gray	18	0,2920	14	0,4770	8	0,7449	13	0,6326	14	0,8818
Venice mallow	<i>Hibiscus trionum</i> L.	10	0,8280	11	0,6480	11	0,5749	15	0,5535	15	0,8358
Velvetleaf	<i>Abutilon theophrasti</i> Medic.	117	0,0010			46	0,0606	23	0,2618	16	0,7115
Green bristlegrass	<i>Setaria viridis</i> (L.) P. B.	3	1,6790	13	0,5490	25	0,2052	24	0,2525	17	0,5898
Hairy crabgrass	<i>Digitaria sanguinalis</i> (L.) Scop.	29	0,1060	32	0,1125	14	0,4815	27	0,1976	18	0,5762
Bermuda grass	<i>Cynodon dactylon</i> (L.) Pers.	16	0,3660	30	0,1289	32	0,1335	30	0,1743	19	0,5144
Maple-leaved goosefoot	<i>Chenopodium hybridum</i> L.	83	0,0070	36	0,1011	26	0,1793	22	0,2834	20	0,4910

OD: order of dominance

**Table 9:** The most important weeds of maize in the order of dominance in late summer (2007-2008)

English name of the weeds	Latin name of the weeds	1947-53		1969-71		1987-88		1996-97		2007-2008	
		OD	Cover %	OD	Cover %	OD	Cover %	OD	Cover %	OD	Cover %
Common ragweed	<i>Ambrosia artemisiifolia</i> L.	18	0,4232	6	1,1680	4	4,1458	1	7,7734	1	8,7159
Barnyardgrass	<i>Echinochloa crus-galli</i> (L.) P.B.	7	1,6774	1	7,2243	1	8,5200	2	7,6739	2	8,3536
Lambsquarters	<i>Chenopodium album</i> L.	3	2,2945	4	3,0914	3	5,2340	4	4,5575	3	6,7690
Yellow foxtail	<i>Setaria pumila</i> (Poir.) R. et Sch. ( <i>S. glauca</i> )	5	1,8024	2	3,5007	6	1,3930	12	0,9431	4	3,1539
Redroot pigweed	<i>Amaranthus retroflexus</i> L.	13	0,9795	5	2,8350	2	5,8790	3	7,1573	5	2,7616
Canada thistle	<i>Cirsium arvense</i> (L.) Scop.	2	2,4911	7	1,1007	10	0,7749	8	1,7740	6	1,9877
Jimson weed	<i>Datura stramonium</i> L.	107	0,0101	37	0,1180	12	0,7519	5	2,0903	7	1,9070
Common millet	<i>Panicum miliaceum</i> L.	119	0,0063	113	0,0072	15	0,5687	10	1,1989	8	1,8988
Green amaranth	<i>Amaranthus chlorostachys</i> Willd.	62	0,0461	10	0,7731	7	1,1028	7	1,8689	9	1,8315
Field bindweed	<i>Convolvulus arvensis</i> L.	1	10,2992	3	3,3949	5	2,7250	6	1,8748	10	1,7860
Johnsongrass	<i>Sorghum halepense</i> (L.) Pers.			55	0,0478	11	0,7736	9	1,5704	11	1,4588
Curlytop knotweed	<i>Persicaria lapathifolia</i> (L.) S.F. Gray	20	0,4038	14	0,5504	8	0,9870	13	0,9072	12	1,1142
Quackgrass	<i>Elymus (Agropyron or Elytrigia) repens</i> (L.) Gould	32	0,2506	17	0,4050	18	0,4837	14	0,8681	13	1,0635
Venice mallow	<i>Hibiscus trionum</i> L.	16	0,4930	8	0,9698	9	0,7848	15	0,7465	14	1,0583
Velvetleaf	<i>Abutilon theophrasti</i> Medic.					40	0,0904	16	0,5970	15	0,9678
Sunflower	<i>Helianthus annuus</i> L.			175	0,0018	23	0,3090	18	0,4532	16	0,8331
Hairy crabgrass	<i>Digitaria sanguinalis</i> (L.) Scop.	8	1,2137	15	0,5109	13	0,6985	22	0,3772	17	0,8186
Green bristlegrass	<i>Setaria viridis</i> (L.) P. B.	4	2,0222	9	0,8082	20	0,3964	23	0,3659	18	0,8099
Common cocklebur	<i>Xanthium strumarium</i> L.	80	0,0207	72	0,0190	16	0,5296	11	1,0731	19	0,6836
Bermuda grass	<i>Cynodon dactylon</i> (L.) Pers.	9	1,2024	20	0,2941	28	0,2226	35	0,1649	20	0,6520

OD: order of dominance

## Survey of weeds in maize

**Region: Po Valley, Italy**

**Contact person: Maurizio Sattin**

### Weed species reported in maize (\*)

Very common	Common	Less common/rare
<b>MONOCOTS</b>		
<i>Echinochloa crus-galli</i> (stable)	<i>Cynodon dactylon</i>	<i>Elymus</i> (or <i>Elytrigia</i> ) <i>repens</i>
<i>Digitaria sanguinalis</i> (stable)	<i>Panicum dichotomiflorum</i>	<i>Panicum miliaceum</i>
<i>Sorghum halepense</i> (increasing) (from both seeds and rhizomes)	<i>Poa</i> spp.	<i>Setaria glauca</i>
<i>Setaria viridis</i> (stable)		<i>Setaria verticillata</i>
<b>DICOTS</b>		
<i>Amaranthus</i> spp. (stable) (ranked for importance: retroflexus, hybridus, graecizans, rudis albus and blitoides and many interspecific hybrids)	<i>Abutilon theophrasti</i> (stable)	<i>Ambrosia artemisiifolia</i>
	<i>Acalypha virginica</i>	<i>Ammi majus</i>
	<i>Bidens tripartita</i>	<i>Anagallis arvensis</i>
	<i>Calystegia sepium</i>	<i>Anthemis</i> spp.
<i>Chenopodium album</i> (stable)	<i>Chenopodium polyspermum</i>	<i>Atriplex</i> spp.
<i>Polygonum persicaria</i> (increasing)	<i>Convolvulus arvensis</i> (stable)	<i>Bidens frondosa</i>
<i>Solanum nigrum</i> (stable)	<i>Datura stramonium</i>	<i>Chenopodium ficifolium</i>
	<i>Equisetum arvense</i>	<i>Cirsium vulgare</i>
	<i>Fallopia convolvulus</i>	<i>Commelina</i> spp.
	<i>Galinsoga parviflora</i>	<i>Cyperus</i> spp.
	<i>Polygonum aviculare</i> (increasing)	<i>Euphorbia</i> spp.
	<i>Polygonum lapathifolium</i>	<i>Helianthus tuberosus</i>
	<i>Portulaca oleracea</i> (stable)	<i>Humulus lupulus</i>
	<i>Xanthium italicum</i> (increasing)	<i>Kickxia</i> spp.
		<i>Lamium</i> spp.
		<i>Matricaria</i> spp.
		<i>Mercurialis annua</i>
		<i>Myagrimum perforatum</i>
		<i>Phytolacca Americana</i>



		<i>Papaver rhoeas</i> <i>Picris</i> spp. <i>Plantago major</i> <i>Raphanus raphanistrum</i> <i>Rapistrum rugosum</i> <i>Rumex</i> spp. <i>Senecio vulgaris</i> <i>Sicyos angulatus</i> <i>Siegesbeckia orientalis</i> <i>Sinapis</i> spp. <i>Sonchus arvensis</i> <i>Stellaria media</i> <i>Thlaspi arvense</i> <i>Veronica</i> spp.
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(\*) The information is based on recent ENDURE expert interviews, weed surveys, recent articles in technical magazines and scientific papers.

For the most important species I have added information whether it is increasing or not.

The second column includes species that are not generally present in maize fields, but infest areas with specific pedo-climatic and/or agronomic conditions. They are often difficult-to-control weeds.

The last column includes some rare species and many species which were not commonly found in maize crops in the Po Valley, but they are now appearing because of earlier sowing.

## Survey of weeds in maize

**Region: Poland**

**Contact person: Elzbieta Czembor**

**(1-15; 15= high significance, 1= low significance)**

<i>Abutilon theophrasti</i>	0
<i>Agropyron</i>	0
<i>Amaranthus retroflexus</i>	14
<i>Ambrosia</i>	0
<i>Anagallis arvensis</i>	0
<i>Anthemis</i> spp.	12
<i>Artemisia vulgaris</i>	0
<i>Atriplex</i>	0
<i>Bidens</i> spp.	0
<i>Bilderdykia</i>	0
<i>Calystegia sepium</i>	0
<i>Camomille inodore</i>	0
<i>Capsella bursa pastoris</i>	6
<i>Centauera cyanus</i>	8
<i>Chenopodium album</i>	14
<i>Cirsium</i> spp. ( <i>arvense</i> )	12
<i>Convolvulus arvensis</i>	0
<i>Cyperus rotundus</i>	0
<i>Datura estramonium</i>	0
<i>Digitaria sanguinalis</i>	0
<i>Echinochloa crus galli</i>	14
<i>Elymus repens</i>	14
<i>Fumaria officinalis</i>	0
<i>Galinsoga parviflora</i>	0
<i>Galium aparine</i>	12
<i>Geranium</i> spp.	0
<i>Heliantus annuus</i>	0
<i>Laminum purpureum</i>	5
<i>Linaria vulgaris</i>	0
<i>Mercurialis annua</i>	0
<i>Panicum</i>	0
<i>Phragmites</i>	0
<i>Poa annua</i>	0
<i>Poligonum aviculare</i>	7
<i>Polygonum convolvulus</i>	0
<i>Polygonum lapathifolium</i>	0
<i>Polygonum persicaria</i>	0
<i>Portulaca oleracea</i>	0
<i>Prunus cerasus</i>	0
<i>Rubus</i>	0
<i>Rumex</i> spp.	0
<i>Setaria viridis</i>	0
<i>Sinapsis arvensis</i>	7
<i>Solanum nigrum</i>	12

<i>Sorghum halepense</i>	0
<i>Stellaria media</i>	4
<i>Sycios angulatus</i>	0
<i>Thlaspi arvense</i>	6
<i>Tripleurospermum inodorum</i>	0
<i>Veronica</i> spp.	4
<i>Viola</i> spp.	0
<i>Xanthium</i> spp.	0

## Survey of weeds in maize

Region: Poland and others

Contact person: ENDURE survey by Meissle et al. 2010

M. Meissle et al.

Pest management in European maize production

		Hungary Békés	Hungary Tolna	Italy Po Valley	Spain Ebro Valley	France Southwest	France Grand-Ouest	Netherlands	Denmark	Germany Southwest	Poland Southwest
<b>Monocotyledonae</b>											
Poaceae	<i>Digitaria sanguinalis</i> (L.) Scop.	■	■	■	■	■	■	■	■	■	■
	<i>Echinochloa crus-galli</i> (L.) Beauv.	■	■	■	■	■	■	■	■	■	■
	<i>Elymus repens</i> (L.) Gould	■	■	■	■	■	■	■	■	■	■
	<i>Panicum</i> [e.g. <i>miliaceum</i> L.]	■	■	■	■	■	■	■	■	■	■
	<i>Poa annua</i> L.	■	■	■	■	■	■	■	■	■	■
	<i>Setaria viridis</i> (L.) Beauv.	■	■	■	■	■	■	■	■	■	■
	<i>Sorghum halepense</i> (L.) Pers.	■	■	■	■	■	■	■	■	■	■
<b>Dicotyledonae</b>											
Amaranthaceae	<i>Amaranthus</i> [e.g. <i>retroflexus</i> L.]	■	■	■	■	■	■	■	■	■	■
Asteraceae	<i>Ambrosia artemisiifolia</i> L.	■	■	■	■	■	■	■	■	■	■
	<i>Anthemis</i> spp.	■	■	■	■	■	■	■	■	■	■
	<i>Cirsium</i> [e.g. <i>arvense</i> (L.) Scop.]	■	■	■	■	■	■	■	■	■	■
	<i>Tripleurospermum inodorum</i> (L.) Sch.-Bip.	■	■	■	■	■	■	■	■	■	■
	<i>Xanthium</i> [e.g. <i>strumarium</i> L.]	■	■	■	■	■	■	■	■	■	■
Caryophyllaceae	<i>Stellaria media</i> (L.) Vill.	■	■	■	■	■	■	■	■	■	■
Chenopodiaceae	<i>Chenopodium album</i> L.	■	■	■	■	■	■	■	■	■	■
Convolvulaceae	<i>Calystegia sepium</i> (L.) R. Br.	■	■	■	■	■	■	■	■	■	■
	<i>Convolvulus arvensis</i> L.	■	■	■	■	■	■	■	■	■	■
Geraniaceae	<i>Geranium</i> [e.g. <i>molle</i> L.]	■	■	■	■	■	■	■	■	■	■
Malvaceae	<i>Abutilon theophrasti</i> Med.	■	■	■	■	■	■	■	■	■	■
Plantaginaceae	<i>Veronica</i> [e.g. <i>persica</i> Poir]	■	■	■	■	■	■	■	■	■	■
Polygonaceae	<i>Fallopia convolvulus</i> (L.) A. Löve	■	■	■	■	■	■	■	■	■	■
	<i>Polygonum aviculare</i> L.	■	■	■	■	■	■	■	■	■	■
	<i>Polygonum persicaria</i> L.	■	■	■	■	■	■	■	■	■	■
Portulacaceae	<i>Portulaca oleracea</i> L.	■	■	■	■	■	■	■	■	■	■
Rubiaceae	<i>Galium aparine</i> L.	■	■	■	■	■	■	■	■	■	■
Solanaceae	<i>Datura</i> [e.g. <i>stramonium</i> L.]	■	■	■	■	■	■	■	■	■	■
	<i>Solanum nigrum</i> L.	■	■	■	■	■	■	■	■	■	■
Violaceae	<i>Viola</i> spp.	■	■	■	■	■	■	■	■	■	■

**Fig. 2** Most important weeds in European maize production. Significance is represented by symbol colour: black = high, grey = medium, white = low. Occurrence is represented by symbol size: large = widespread and regularly, medium = widespread and occasionally, small = regionally and rare. The 5-year population development is represented by arrows: up = increasing, horizontal = stable, down = decreasing.

## Survey of weeds in maize

Region: Romania

Contact person: Sandoiu Dumitru

Scientific name	Common Romanian name	Family	Time
<b>Monotyledonous annual weeds</b>			
<i><b>Digitaria sanguinalis</b></i>	Meișor	Gramineae	In spring
<i><b>Echinichloa crus-galli</b></i>	Mohor lat, iarba bārboasă	Gramineae	
<i><b>Setaria glauca</b></i>	Mohor	Gramineae	
<i><b>Setaria viridis</b></i>	Mohor verde	Gramineae	
<b>Monocotyledonous perennial weeds</b>			
<i><b>Phragmites communis</b></i>	Trestie	Gramineae	In summer
Elymus (Agropyron) repens	Pir târător	Gramineae	
Cynodon dactylon	Pir gros	Gramineae	
<i><b>Sorghum halepense</b></i>	Costrei, bălur	Gramineae	
<b>Parasitic weeds</b>			
<i><b>Cuscuta campestris</b></i>	Tortel	Cuscutaceae	In summer
<b>Dicotyledonous annual weeds</b>			
<i>Draba verna</i>	Flămânzică	Cuciferae	In spring
<i>Erodium cicutarium</i>	Pliscul cucoarei	Geraniaceae	
<i>Lamium amplexicaule</i>	Urzică moartă, Sugel	Labiatae	
<i>Lamium purpureum</i>	Sugel	Labiatae	
<i><b>Stellaria media</b></i>	Rocoină	Caryophyllaceae	
<i>Senecio vernalis</i>	Spălăcioasă	Compositae	
<i>Veronica hederifolia</i>	Șopîrliță, doritoare	Scrophulariaceae	
<i>Ranunculus arvensis</i>	Piciorul cocoșului	Ranunculaceae	
<i>Anagallis arvensis</i>	Scânteiuță	Primulaceae	
<i>Bifora radians</i>	Buruiană puturoasă	Umbelliferae	
<i>Caucalis daucoides</i>	Morcov sălbatic	Umbelliferae	
<i>Caucalis platycarpus</i>	Morcov spinos	Umbelliferae	
<i>Brassica rapa</i>	Rapiță	Cruciferae	
<i>Brassica nigra</i>	Muștar negru	Cruciferae	
<i><b>Raphanus raphanistrum</b></i>	Ridichioară, R. sălbatecă	Cruciferae	
<i><b>Sinapis arvensis</b></i>	Muștar sălbatec	Cruciferae	
<i>Sinapis alba</i>	Muștar alb	Cruciferae	
<i>Cannabis sativa</i>	Cînepă sălbatecă	Canabaceae	
<i>Euphorbia exigua</i>	Alior mărunț	Euphorbiaceae	
<i>Euphorbia helioscopia</i>	Laptele cucului	Euphorbiaceae	

<i>Fumaria schleicheri</i>	Fumariță	Papaveraceae	
<i>Galium aparine</i>	Turița	Rubiaceae	
<i>Galium tricornutum</i>	Turița cu 3 coarne	Rubiaceae	
<i>Lithospermum arvense</i>	Mărgelușe	Boraginaceae	
<i>Polygonum aviculare</i>	Troscot	Polygonaceae	
<i>Polygonum hydropiper</i>	Piperul bălții	Polygonaceae	
<i>Polygonum lapathypholium</i>	Iarba roșie	Polygonaceae	
<i>Polygonum persicaria</i>	Iarba roșie	Polygonaceae	
<i>Polygonum convolvulus</i>	Hrișca urcătoare	Polygonaceae	
<i>Bidens tripartita</i>	Dentiță	Compositae	In summer
<i>Galinsoga parviflora</i>	Busuioc sălbatec	Compositae	
<b><i>Sonchus asper</i></b>	Susai aspru	Compositae	
<i>Sonchus oleraceus</i>	Susai moale	Compositae	
<i>Xanthium italicum</i>	Cornaci	Compositae	
<i>Xanthium spinosum</i>	Holeră	Compositae	
<i>Xanthium strumarium</i>	Cornuți	Compositae	
<i>Chenopodium album</i>	Căpriță	Chenopodiaceae	
<i>Chenopodium hybridum</i>	Talpa găștei	Chenopodiaceae	
<i>Chenopodium polyspermum</i>	Spanac sălbatec	Chenopodiaceae	
<i>Salsola kali</i>	Ciurlan	Chenopodiaceae	
<b><i>Datura stramonium</i></b>	Datură	Solanaceae	
<b><i>Solanum nigrum</i></b>	Zârna	Solanaceae	
<i>Hibiscus trionum</i>	Zămoșiță	Malvaceae	
<i>Portulacca oleracea</i>	Iarba grasă	Portulacaceae	
<i>Spergula arvensis</i>	Hrana vacii	Caryophyllaceae	
<i>Tribulus terrestris</i>	Colții babei	Zigophyllaceae	
<b><i>Anthemis arvensis</i></b>	Romaniță	Compositae	From autumn to winter
<i>Centaurea cyanus</i>	Albăstrița	Compositae	
<i>Descurainia sophya</i>	Voinicică	Compositae	
<i>Erigeron canadiensis</i>	Bătrâniș	Compositae	
<i>Matricaria chamomilla</i>	Mușețel	Compositae	In spring
<i>Matricaria inodora</i>	Mușețel nemirositor	Compositae	
<i>Capsella bursa pastoris</i>	Traista ciobanului	Cruciferae	
<i>Descurainia sophia</i>	Voinicică	Cruciferae	
<b><i>Thlaspi arvense</i></b>	Punguliță	Cruciferae	
<i>Consolida regalis</i>	Nemțișor de câmp	Ranunculaceae	
<i>Viola tricolor</i>	Trei frați pătați	Violaceae	
<i>Viola arvensis</i>	Trei frați pătați	Violaceae	

<b>Biannual weeds</b>			
<b><i>Arctium lapa</i></b>	Brusture	Compositae	In summer
<i>Carduus nutans</i>	Scaiete, ciulin	Compositae	
<i>Carduus acantoides</i>	Spin	Compositae	
<i>Onopordon acantium</i>	Scai măgăresc	Compositae	
<i>Hyosyamus niger</i>	Măselariță	Solanaceae	
<i>Melilotus albus</i>	Sulfină albă	Leguminosae	
<i>Reseda lutea</i>	Rechie	Resedaceae	
<b><i>Verbascum phlomoides</i></b>	Lumânărică	Scrofulariaceae	
<b>Perennial dicotyledonous weeds</b>			
<b><i>Cicorium intybus</i></b>	Cicoare	Compositae	Occasional perennial
<b><i>Taraxacum officinale</i></b>	Păpădie	Compositae	
<i>Plantago lanceolata</i>	Pătlagina îngustă	Plantaginaceae	
<i>Plantago major</i>	Pătlagină mare	Plantaginaceae	
<i>Plantago media</i>	Patlagină mijlocie	Plantaginaceae	
<i>Ranunculus acer</i>	Piciorul cocoșului, Floare broștească	Ranunculaceae	
<b><i>Rumex acetosella</i></b>	Măcriș mărunț	Polygonaceae	
<b><i>Rubus caesius</i></b>	Rug	Rosaceae	Stoloniferous
<b><i>Ranunculus repens</i></b>	Floare de lac	Ranunculaceae	
<b><i>Cirsium arvense</i></b>	Pălămidă	Compositae	With suker (root)
<b><i>Sonchus arvensis</i></b>	Susai	Compositae	
<b><i>Cardaria draba</i></b>	Urda vacii	Cruciferae	
<b><i>Euphorbia cyparissias</i></b>	Alior	Euphorbiaceae	
<i>Euphorbia virgata</i>	Lapte de cucului	Euphorbiaceae	
<b><i>Convolvulus arvensis</i></b>	Volbura	Convolvulaceae	
<i>Linaria vulgaris</i>	Linariță	Scrophulariaceae	
<b><i>Rumex acetosa</i></b>	Măcriș mare	Polygonaceae	
<i>Aristolochia clematidis</i>	Cucurbețică	Aristolochiaceae	By rhizome
<b><i>Equisetum arvense (spori)</i></b>	Coada calului	Equisetaceae	
<i>Lathyrus tuberosus</i>	Sângele voinicului, oreșniță	Leguminosae	
<i>Polygonum amphibium</i>	Troscot de baltă	Polygonaceae	
<i>Sambucus ebulus</i>	Boz	Caprifoliaceae	

The species with *italic* and **bold** have a strong representation in corn areas.

### Survey of weeds in maize

Region: Andalusia, Spain (Middle Valley of the Guadalquivir River)

Contact person: Milagros Saavedra

### Weed species reported in maize

This information is from a survey (1983-1984) of Milagros Saavedra's Tesis Doctoral (similar PhD). Although completed with new information on species that more recently are causing problems of control as *Conyza* spp. or *Aster squamatus*. It includes another species, not observed in this referred survey, but observed in other visits at the fields of maize.

#### Very common weed (Frequent and/or abundant)

- *Amaranthus blitoides* S. Watson
- *Amaranthus hybridus* L.
- *Amaranthus powellii* S. Watson
- *Amaranthus retroflexus* L.
- *Chenopodium album* L.
- *Chenopodium opulifolium* Schrader ex Koch & Ziz
- *Convolvulus arvensis* L.
- *Conyza bonariensis* (L.) Cronquist
- *Conyza canadensis* (L.) Cronquist
- *Conyza sumatrensis* (Renz.) E. Walker
- *Cyperus rotundus* L.
- *Datura stramonium* L.
- *Digitaria sanguinalis* L. Scop.
- *Echinochloa colonum* (L.) Link
- *Echinochloa crus-galli* (L.) P. Beauv.
- *Paspalum paspalodes* (Michx.) Scribn. = *Paspalum distichum* L.
- *Polygonum aviculare* L.
- *Portulaca oleracea* L.
- *Setaria adhaerens* (Forssk.) Chiov.
- *Solanum nigrum* L.
- *Sorghum halepense* (L.) Pers.
- *Sonchus oleraceus* L.

#### Common

- *Amaranthus albus* L.
- *Amaranthus viridis* L.
- *Anagallis arvensis* L.
- *Aster squamatus* (Spreng.) Hieron
- *Brachiaria eruciformis* (Sm.) Griseb
- *Capsella bursa-pastoris* (L.) Medik.
- *Capsella rubella* Reut
- *Chenopodium vulvaria* L.
- *Chrozophora tinctoria* (L.) Raf.
- *Cynodon dactylon* (L.) Pers.
- *Euphorbia nutans* Lag.



- *Fumaria officinalis* L.
- *Fumaria parviflora* Lam.
- *Helianthus annuus* L. (Previous crop)
- *Phragmites australis* (Cav.) Tr in ex Stend.
- *Picris echioides* L.
- *Polygonum lapathifolium* L.
- *Polygonum persicaria* L.
- *Rumex crispus* L.
- *Setaria pumila* (Poir.) Roem & Schult.
- *Stellaria media* (L.) Vill.
- *Urtica urens* L.
- *Xanthium strumarium* L.

#### Less common/rare

- *Amaranthus graecizans* L.
- *Amaranthus muricatus* (Moq) Hieron
- *Asparagus officinalis* L. (Previous crop)
- *Atriplex patula* L.
- *Atriplex prostrata* L.
- *Beta vulgaris* L.
- *Cardaria draba* (L.) Desv
- *Coronopus didymus* (L.) Sm.
- *Coronopus squamatus* (Forsk.) Asch.
- *Cyperus* spp.
- *Diplotaxis virgata* (Cav. DC.)
- *Eclipta prostrata* (L.) L.
- *Ecballium elaterium* A. Rich.
- *Eragrostis barrelieri* Daveau
- *Eragrostis virescens* C. Presl
- *Falopia convolvulus* (L.) Á.Löve
- *Fumaria officinalis* L.
- *Fumaria parviflora* Lam.
- *Heliotropium europaeum* L.
- *Galium aparine* L.
- *Kickxia lanigera* (Desf.) Hand.-Mazz.
- *Lactuca serriola* L.
- *Lamium amplexicaule* L.
- *Malva parviflora* L.
- *Papaver rhoeas* L.
- *Phalaris brachystachys* Link
- *Phalaris coerulescens* Desf.
- *Phalaris paradoxa* L.
- *Phalaris minor* Retz.
- *Piptatherum miliaceum* (L.) Coss.
- *Poa annua* L.
- *Pulicaria paludosa* Link

- *Ridolfia segetum* (L.) Moris
- *Rumex pulcher* L.
- *Setaria verticillata* (L.) P. Beauv.
- *Silybum marianum* (L.) Gaertn.
- *Sonchus asper* (L.) Hill
- *Xanthium spinosum* L.

Other weeds can be present in years with high rainfall and low temperature, and/or sowed early. In this case, some characteristic weeds of hiber crops can be present in maize. For example:

- *Anacyclus clavatus* (Desf.) Pers.
- *Anthemis arvensis* L.
- *Avena sterilis* L. subsp. *sterilis* = *Avena macrocarpa* Moench
- *Bromus diandrus* Roth
- *Chamaemelum fuscatum* (Brot.) Vasc.
- *Cichorium intybus* L.
- *Convolvulus humilis* Jacq.
- *Erodium moschatum* (L.) L'Hér.
- *Fumaria densiflora* DC.
- *Fumaria faurei* (Pugsley) Lidén
- *Hirschfeldia incana* (L.) Lagr.-Foss.
- *Hordeum murinum* L.
- *Lolium rigidum* Gaudin
- *Papaver hybridum* L.
- *Polypogon monspeliensis* (L.) Desf.
- *Ranunculus parviflorus* L.
- *Ranunculus trilobus* Desf.
- *Rapistrum rugosum* (L.) All.
- *Silene gallica* L.
- *Sinapis alba* L.
- *Sinapis arvensis* L.
- *Vaccaria hispanica* (Mill.) Rauschert
- *Veronica hederifolia* L.
- *Veronica polita* Fr.
- *Vicia lutea* L.

## Survey of weeds in maize

**Region: Ebro Valley, Spain**

**Contact person: Andreu Taberner**

### Weed species reported in maize

Very common	Common	Less common/rare
<i>Abutilon theophrasti</i> (A) <i>Amaranthus hybridus</i> (A) <i>Amaranthus retroflexus</i> (A) <i>Chenopodium album</i> (A) <i>Convolvulus arvensis</i> (P) <i>Cyperus rotundus</i> (P) <i>Datura stramonium</i> (A) <i>Polygonum aviculare</i> (A) <i>Portulaca oleracea</i> (A) <i>Solanum nigrum</i> (A) <i>Sonchus</i> spp. (A o B) <i>Xanthium strumarium</i> (A) <i>X. spinosum</i> (A) <i>Oxalis latifolia</i> (P) <i>Cyperus rotundus</i> (P) <i>Digitaria sanguinalis</i> (A) <i>Echinochloa crus-galli</i> (A) <i>Setaria adhaerens</i> (A) <i>Setaria pumila</i> (A) <i>S. verticillata</i> (A) <i>Sorghum halepense</i> (P) <i>Echinochloa colona</i> (A) <i>Eleusine indica</i> (A)	<i>Amaranthus albus</i> (A) <i>Amaranthus blitoides</i> (A) <i>Calistegia sepium</i> (P) <i>Cardaria draba</i> (P) <i>Euphorbia helioscopia</i> (A) <i>Kicxia spurea</i> (A) <i>Lactuca scariola</i> (A o B) <i>Malva sylvestris</i> (B o P) <i>Cynodon dactylon</i> (P)	<i>Heliotropium europaeum</i> (A) <i>P. convolvulus</i> (A) <i>P. persicaria</i> (A) <i>Rumex crispus</i> (B o P) <i>R. obtusifolius</i> (B o P) <i>Salsola kali</i> (A) <i>Senecio vulgaris</i> (A) <i>Verbena officinalis</i> (B o P) <i>Stellaria media</i> (A) <i>Malva parviflora</i> (A) <i>Melilotus</i> spp. (B o P) <i>E. colona</i> (A) <i>Equisetum ramosissimum</i> (P) <i>Panicum dichotomiflorum</i> (A) <i>Poa annua</i> (A)

A = Annual

P = Perennial

B = Biannual

Survey of weeds in maize

Region: United Kingdom  
Contact person: Bob Froud-Williams

**From:** Bob Froud-Williams [mailto:r.j.froud-williams@reading.ac.uk]  
**Sent:** 11. juni 2010 10:04  
**To:** Per Nielsen Kudsk  
**Subject:** Re: Database of weeds reported in maize fields

Hi Per,

further to my previous e-mail I have consulted the FSE reports. However, the actual weed flora of the 68 sites sown to forage maize does not appear to be presented in terms of frequency of occurrence, but rather twelve species common to all crops were analysed individually. For information these were *Capsella bursa-pastoris*, *Chenopodium album*, *Fallopia convolvulus*, *Lamium purpureum*, *Persicaria maculosa*, *Poa annua*, *Polygonum aviculare*, *Senecio vulgaris*, *Sonchus* spp., *Stellaria media*, *Veronica persica* and *Viola arvensis*. Note the absence of *Solanum nigrum* which would be expected in maize. I will contact the authors to see whether I can gain more information.

Bob

----- Original Message -----

**From:** [Per Nielsen Kudsk](#)  
**To:** [Bob Froud-Williams](#)  
**Sent:** Thursday, May 27, 2010 4:17 PM  
**Subject:** Database of weeds reported in maize fields

Dear Bob,

Our department has been commissioned by Monsanto to carry out a desk study survey on weeds in maize. The objective is to create a database of weeds reported in key maize fields in key maize growing regions of Europe. Our role in the project is to compile the available information in an Access database, analyse the data and write a report summarising and discussing the results.

I am contacting you because I consider you to be the leading maize weed specialist in the UK.

The information I am looking for could preferably be in the form of a weed survey, if a survey was conducted in your region recently. If this is not the case I would be grateful if you could provide me with a list of weed species reported in maize in your region. You can fill in the names of the weed species (preferably the scientific names) in the attached Word file. As you will see I have asked you to classify each weed species as being *very common*, *common* or *rare* but I would like to stress that a comprehensive list with as many of the reported weed species as possible is more important than a correct assessment of their frequency.

Although this work is commissioned by Monsanto it is not intended to be confidential. You will therefore receive a copy of the final version of the report and, furthermore, if the consistency and quality of the data allow, and you as data provider agree, we may decide to submit a paper for an international journal/conference with you as one of the co-authors.

I hope you are prepared to participate but please let me as soon as possible if you will/can provide the requested information.

Kind regards

**Per Kudsk**  
Head of research unit  
  
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