# A national survey of rare arable plants in France

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The French Department of Ecology has set up national programs to preserve the most threatened fauna and flora species, in application of the French commitments for biodiversity preservation. The arable weeds were identified as a priority, because of the dramatic changes in the wild communities of arable lands due to cropping practices and use of agrochemicals since the 20th century. Some species seem to be already extinct and a few are on the brink of extinction in France.

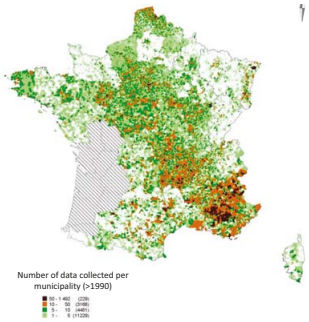
## 102 taxa were listed in 2000 as strictly associated with arable lands in France

*Adonis aestivalis, Adonis annua, Adonis flammea, Adonis microcarpa, Agrostemma githago, Ajuga chamaepitys, Allium rotundum, Alopecurus myosuroides, Anchusa arvensis, Androsace maxima, Anthemis altissima, Apera spica-venti, Aphanes arvensis, Arrhenatherum elatius subsp. bulbosum, Asperula arvensis, Avena fatua, Bifora radians, Bifora testiculata , Bromus arvensis, Bromus secalinus, Bunium bulbocastanum, Bunium pachypodum, Bupleurum rotundifolium, Bupleurum subovatum, Calepina irregularis, Camelina alyssum, Camelina microcarpa, Camelina rumelica, Camelina sativa, Caucalis platycarpos, Centaurea cyanus, Cephalaria syriaca, Ceratocephalus falcatus, Cnicus benedictus, Conringia orientalis, Consolida ajacis, Consolida hispanica, Consolida pubescens, Consolida regalis, Cuscuta epilinum, Delphinium halteratum, Delphinium verdunense, Euphorbia falcata, Gagea villosa, Galium spurium , Galium tricornutum, Garidella nigellastrum, Gladiolus italicus, Glaucium corniculatum, Glebionis segetum Hypecoum imberbe, Hypecoum pendulum, Iberis pinnata, Legousia hybrida, Legousia speculum-veneris, Lithospermum arvense, Lolium remotum, Lolium temulentum, Myagrum perfoliatum, Neslia paniculata, Nigella arvensis, Nigella gallica, Orlaya grandiflora, Ornithogalum nutans, Papaver argemone, Papaver hybridum, Papaver rhoeas, Polycnemum arvense, Polycnemum majus, Polygonum bellardii, Ranunculus arvensis, Ridolfia segetum, Roemeria hybrida, Scandix pecten-veneris, Scleranthus annuus, Silene conoidea, Silene cretica, Silene linicola, Silene muscipula, Sinapis alba, Spergula arvensis, Spergularia segetalis, Stachys annua, Thlaspi arvense, Thymelaea passerina, Torilis leptophylla, Tulipa agenensis, Tulipa clusiana, Tulipa gesneriana, Tulipa lortetii , Tulipa raddii, Tulipa sylvestris subsp. sylvestris, Turgenia latifolia, Vaccaria hispanica, Valerianella coronata, Valerianella dentata, Valerianella echinata, Valerianella rimosa, Vicia articulata, Vicia pannonica subsp. Striata, Vicia villosa, Viola arvensis.*

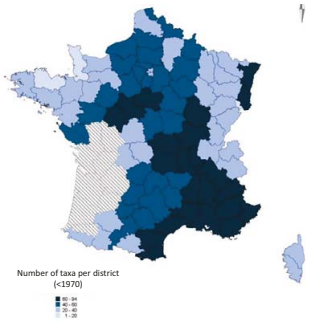
In 2009 and 2010 more than 190 000 data were collected. Each data is related to a district, a municipality, an observation date and/or a publication date and an author. Two periods were considered to assess the decrease of plants related to arable lands, before 1970 and after 1990.

| | ≤ 1970 | 1970-1990 | > 1990 | No date | total |
|---|---|---|---|---|---|
| **Numbers of data collected** | 33 591 | 11 524 | 140 585 | 4 515 | 190 215 |
| **Numbers of data coming from** | | | | | |
| **Field investigations** | 779 | 6 494 | 98 973 | 168 | 106 414 |
| **bibliography** | 26 592 | 3 478 | 8 542 | 3 808 | 42 420 |
| **herbarium** | 2 035 | 208 | 278 | 104 | 2 625 |
| **Not communicated** | 4 185 | 1 344 | 32 792 | 435 | 38 756 |

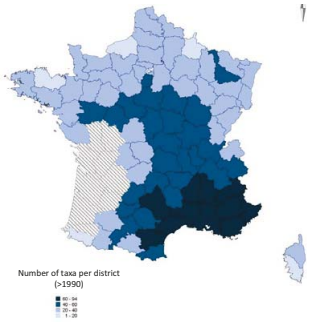
*Data were collected from the CBN's databases (no data available from the South-West), the Floraine association, the Botanic Society of Alsace and the Botanical Gardens and Conservatory of Nancy.*



Number of data collected per municipality (>1990)



Number of taxa per district (<1970)

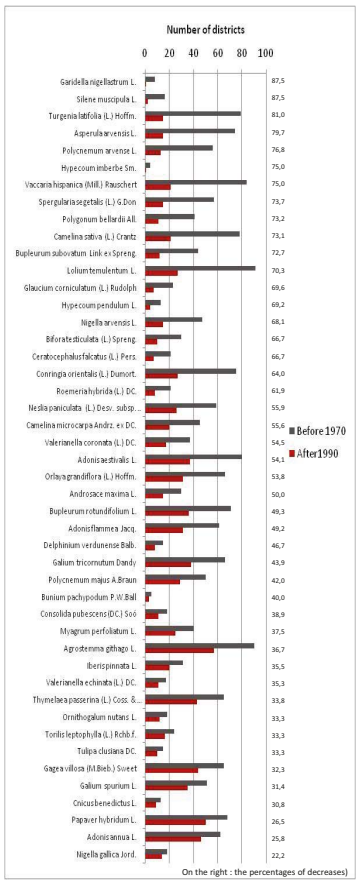


Number of taxa per district (>1990)

Number of segetal species per district according to the data collected ; left : before 1970 ; right : after 1990.

## Bring to light the decline of the species

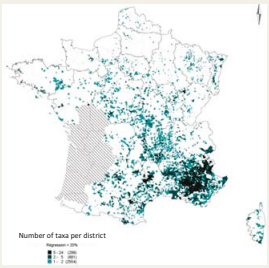
9 taxa are thought to be extinct in France ;
25 taxa were recorded in less than half the districts they were previously known ;
3 taxa are now confined to only one district : *Adonis microcarpa, Hypecoum imberbe, Garidella nigellastrum ;*
Even the most common species before 1970 were found to have dramaticaly decreased in terms of occurrence and abundance.




On the right : the percentages of decreases)

**10 taxa are protected in the whole French territory and 18 in at least one region ;**
**19 taxa are listed in the French Red data book of vascular plants.**

The richest areas for rare segetal plants are located in the South-East, where soils are light and chalky and agriculture is still extensive. Elsewhere, segetal communities are confined to strips along field edges or scattered in other habitats (abandoned lands, disturbed sites, sandy lands).



Number of taxa per district

***A species action plan (Plan national d'action en faveur des plantes messicoles) was initiated and a data collection was carried out throught the network of the National Botanical Conservatories (CBN), scientific structures in charge of the survey and preservation of the wild flora and habitats.***

The action plan aims at :

- Valorizing the fonctional role of arable flowers as they contribute to maintain farmland biodiversity and the ecological services associated ;

- Developping agri-environnemental schemes with measures adapted to encourage farmers to manage fields or field margins as refugees for biodiversity ;

- Connecting the actions with other programs involved in preservation of biodiversity in agricultural lanscapes ;

- Taking into consideration cereal field margins as habitats to preserve throught national and local policies (wildlife corridors) ;

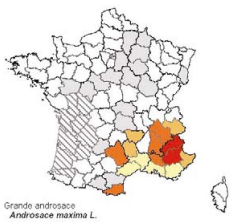
An arable field in Larzac

- Improving the knowledge of arable plant distributions and identifying local hot spots ;

- Producing seeds to restore floristic diversity while protecting the local origins.

Sown strips of arable flowers in Armagnac

## Some species to illustrate the decrease in distribution

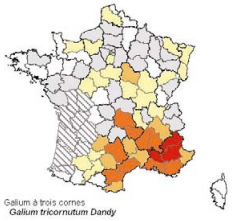


Grande androsace
*Androsace maxima L.*

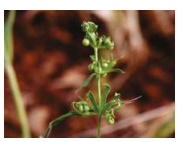
*Androsace maxima* grows on calcareous loams. Probably extinct in the north, it is still found in the South-East

Spergulaire des moissons
*Spergularia segetalis (L.) G.Don*

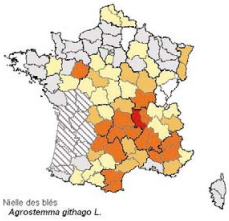
Once widespread throughout France, *Spergularia segetalis* is now scattered in about 10 districts, often in other habitats than arable field ; Plant communities on sandy loams were dramatically affected by chalky improvements and nitrogen fertilisers.



Galium à trois cornes
*Galium tricornutum Dandy*



*Galium tricornutum* disappeared from 28 districts where it was recorded before 1970.



Nielle des blés
*Agrostemma githago L.*

*Agrostemma githago* was formerly widespread throughout France ; it is now rare in the North, occuring mainly on field margins. It is more frequent in areas of mixed farming and stock farming.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