

Avena strigosa (Schreb.) in North-Western Europe: a historical landrace without crop wild relatives?

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Photography M. Scholten Map adapted from Preston *et al.* 2002 New Atlas of the British and Irish Flora



A. strigosa has been used in the past in Scotland both for human consumption, as fodder for horses and cattle, and the straw for furniture and thatching. The photograph above shows one current use on the Outer Hebrides as feed for Highland cattle. On the Shetland Islands the straw is still used to make chairs. It is usually grown as a mixed stand (with rye) to safeguard a harvest in dry years. Traditionally it was stored outside the farm in stacks (below).



Avena strigosa: crop and crop wild relative

Avena strigosa, an annual cereal, is both a minor, neglected crop and a crop wild relative. It is a diploid oat.

As a crop it was domesticated in southern Europe, probably Spain and spread from there over Europe where it was cultivated before the more productive hexaploid oat (*Avena sativa*) made its entry.

A. strigosa does not form a seedbank, it requires continuous reintroduction. Hence, without the crop, there will be no crop wild relatives. This is currently the case in many European countries where cultivation has ceased, for example in a wide survey in Denmark, former stronghold of the crop, not one plant was discovered (Weibull, 2001).

The fate of not-native crop wild relatives: the example of the UK

Plants associated with arable and horticultural habitats have undergone the strongest decline compared with plants in other habitats in the UK. Many crop wild relatives associated with former crops only occur as rare casuals nowadays.

The plight of these plants, many of which not native to the UK, has recently been recognised by UK conservation authorities in the latest national Red Listing. "Archaeophytes", that is, not-native plants that have arrived in the UK before 1500, have been included in the National Red List 2005 and as a consequence will be candidates for Biodiversity Action Plans.

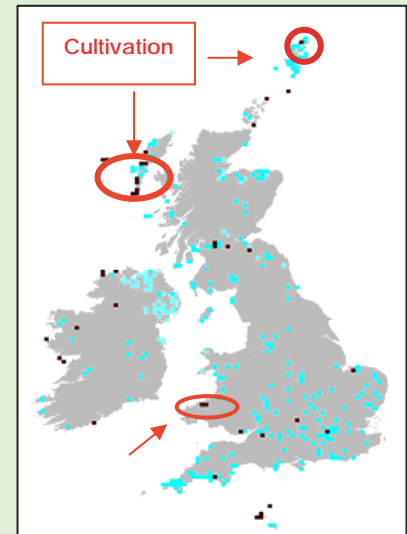


Current distribution of *Avena strigosa*, cultivated and in the wild

Historical geographical distribution includes Austria, Belorussia, Belgium, Corsica, Denmark, France, Finland, Germany, Hungary, Lithuania, Luxemburg, Norway, Portugal, Russia, Slovakia, Spain, Sweden, Switzerland, and the United Kingdom.

In Portugal its cultivation nowadays is restricted to small areas with light sandy soils. Current cultivation in Lithuania comprises four locations of small scale cultivation.

In the UK the remaining area of cultivation is mainly on the Outer Hebrides. Several hundreds of hectares on Machair soils are rented by small-scale farmers or "crofters". Here crofters grow *A. strigosa* rather than the hexaploid modern cultivars because the crop can stand up to high winds and give a yield on the very light manganese deficient soils. The traditional value of the crop is also a reason for some to adhere to this landrace.



Threat

On the short term crop cultivation is plagued by geese eating the grain and spoiling the feed. On the longer term the biggest threat for *A. strigosa* on the Scottish Islands is cessation of cultivation because of depopulation, an ageing crofters population and increased sheep instead of cattle farming.

Conservation

The Machair is one of the priority habitats for conservation in the UK. However, at present, *Avena strigosa* is not listed as a typical species of the Habitat Action Plan for the Machair. Several accessions of *A. strigosa* are conserved in national and international gene banks.



Photograph showing the sandy soils of the Machair on North Uist (Outer Hebrides). In the background silaged fodder (hay and *A. strigosa* mixed with rye). Most, but not all, crofters have abandoned the traditional stacking in favour of silage.

Distribution of *Avena strigosa* in the UK

In turquoise: past occurrences, before 1960, in black: occurrences between 1989–1999. The mainland present occurrences as rare casuals as bird-feed spills. In red circles: areas of cultivation. In 2004 as a crop it was only present on the Outer Hebrides, the Fair Isles, Shetlands islands and in very few locations in Wales.

The role of *Avena strigosa* in agriculture and sustainable development

- It is still a major feed on the Outer Hebrides where it survived as a crop in marginal agricultural circumstances due to its capability to stand up to high winds, tolerate manganese deficiency and very light soils.
- It is also grown as a fodder crop outside of Europe in South America.
- Its introduction as a crop of the European Union Common Catalogue is being discussed at present.
- *Avena strigosa* has breeding qualities such as a very high oil content (Podyma, 1994) and a very long rooting system which makes it an excellent fodder with soil erosion prevention qualities.

Literature cited

Podyma, W. 1994 Występowanie gatunku *Avena strigosa* Schreb. sensu lato oraz zmienność cech morfologicznych i biochemicznych w populacjach tego gatunku (Distribution of *Avena strigosa* Schreb. sensu lato and morphological and biochemical differentiation within the genus) PhD, Radzikow, Blonie, Poland.

Weibull, J. L.L.Johansen Bojensen, V. Rasomavicius 2001 *Avena strigosa* in Denmark and Lithuania. Plant Genetic Resources Newsletter 131: 1-4