GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Camelina sativa***

Camelina sativa 简体中文 正體中文 **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Capparales	Brassicaceae

Common name false flax (English), Siberian oilseed (English), Oljedodre (Norwegian), big-seed false flax (English), Lin bâtard (French), Sæd-Dodder (Danish), German sesame (English), gold-of-pleasure (English), Ruistankio (Finnish), Cameline cultivee (French), Leindotter (German), camelina (Portuguese), camelina pilosa (Spanish), Huttentut (Dutch), Saatdotter (German), large-seeded false flax (German), caméline ciliée (French)

Synonym *Camelina parodii* , Ibarra & La Porte
Myagrum sativum , L. (basionym)

Similar species *Camelina microcarpa*

Summary Camelina sativa can prosper in many different climates and soils. Its ability to survive in a diverse range of habitats enables it to be introduced fairly easily into new environments. It is considered a common weed in many areas, but other areas embrace it for the use of its oils as a food, fuel or for its possible medicinal value. This is a hermaphroditic species, which contains seeds after pollination that are known for the oils that they produce.

view this species on IUCN Red List

Species Description
C. sativa is an annual or winter annual that reaches heights of 30 to 90cm (Mirek, 1981 in Putnam *et al*., 1993). It can have smooth (glabrous) or sparsely hairy stems that become woody at maturity, and is simple or sometimes branched (Klinkenberg, 2008). If hairy, the starlike hairs are more numerous than simple hairs. Leaves are 2-8cm long and are arrow shaped and sharp-pointed with smooth edges (Mirek, 1981 in Putnam *et al*., 1993). They are unstalked or have short stalks and are usually glabrous or only slightly hairy (Klinkenberg, 2008). It produces prolific small flowers defined as racemes which are white, pale yellow (Klinkenberg, 2008) or greenish yellow (Mirek, 1981 in Putnam *et al*., 1993) in colour. Flowers have four petals which are 4-5mm in length. Sepals are 2-3mm in length, styles are 2-2.5mm in length and flower stalks are 10-25mm in length (Klinkenberg, 2008). Fruits are pear shaped pods known as silicles; 7-9mm long, 5-6mm wide with a squared off tip (Klinkenberg, 2008). Seed pods are 6-14mm long and superficially resemble the bolls of flax. Fruits produce 10-25 tiny seeds (Schuster & Friedt, 1998) (0.7mm x 1.5mm), which are pale yellow-brown in colour and oblong in shape with a ridged surface (Mirek, 1981 in Putnam *et al*., 1993).\r\n\r\n
C. sativa var. *sativa* grows in the open it has a wide-branching growth habit. However, in the presence of flax the weed takes on a taller, less branched form which closely resembles a flax plant. This is a classic example of crop-weed coevolution or crop mimicry (Radosevich *et al*., 1997). Baker (1974, in Radosevich *et al*., 1997) suggests that *C. sativa* is in fact one of the best examples of crop mimicry. In some areas where flax cultivation is very intensive *C. sativa* var. *sativa* is replaced by var. *linicola* which has a lifecycle even more aligned with flax. The seeds are so similar that they are not readily separated and must be sown together.
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Notes
It is believed that this species was initially cultivated as an oilseed crop (Radosevich *et al*., 1997). Seed oil content averages at 37 percent by weight.

Lifecycle Stages
C. sativa has a short lifecycle of just 85 to 100 days (Putnam *et al*., 1993). Each plant can produce between 100 and 1000 seeds. Seeds are very tiny with the 1000-seed weight just 1g on average (Schuster & Freidt, 1998). Seeds do not exhibit dormancy (IENICA, 2002; Robinson, 1987 in Putnam *et al*., 1993).

Uses
C. sativa is economically important as a human food due to its oil. It has an oil content of 40% and is rich in essential acids and omega-3 fatty acids including linolenic, linoleic, oleic and eicosenic acids (Ryhänen *et al*., 2009). Byproducts left over after oil extraction from seeds (known as *Camelina* meal or expeller) (Cherian *et al*., 2009; Ryhänen *et al*., 2009) may also have importance as animal fodder. They been used to increase nutritional content of chicken eggs (Cherian *et al*., 2009), rabbit (Peiretti *et al*., 2007), pig (Flachowsky *et al*., 1997), cattle (Moloney *et al*., 1998) and chicken meat for commercial consumption (Ryhänen *et al*., 2009). Seeds of *C. sativa* have also been used as food for caged birds (Putnam *et al*., 1993).\r\n
Further economic importance includes its potential as a petroleum substitute/alcohol and as a potential seed contaminant (USDA-ARS, 2008). In addition, C. sativa together with other oilseed crops, have garnered interest as potential sources of biodiesel (WSSA, 2008). *C. sativa* has attracted interest as an oil crop because of its ability to grow in various climatic conditions, low nutrient requirements and resistance to disease and pests (Francis & Warwick, 2009). Furthermore, the cultivated seed oil from this species was previously used as a food or lamp oil, and sometimes it was used for soap and dye production. It was formerly used for medicinal purposes, and today it is still sometimes applied in the veterinary medicine (Hanelt, 2001).

Habitat Description
C. sativa can exist in a wide variety of habitats including prairies, fields (grain, flax, alfalfa), open woods, lakeshore, dry sandy soils, around elevators, roadsides, railways and waste places or weedy places (CBIF, 2003). *C. sativa* prefers well-drained soils (GISP, 2008).

Reproduction
The propagule of reproduction of *C. sativa* is the seed. This species has an unspecialized mode of dispersal. It uses mixed mating as its system of breeding. The sex of this species is hermaphroditic. The fruit type is called a silicle (API, 2008). The seeds result from either self-pollination, or cross pollination by visiting insects.

General Impacts
C. sativa has been described as an allelopathic crop affecting other crops (Kohli *et al*., 2001). In addition, it has been considered an agricultural weed, environmental weed, and a naturalized weed (GCW, 2007) in addition to an economic weed (API, 2008). However, *C. sativa* is primarily a minor weed in flax and not often a problem in other crops (Putnam *et al*., 1993).

Management Info
<u>Chemical</u>: Sulfentrazone, a PRE herbicide, completely eliminated *C. sativa* from treated plots regardless of rate in an experiment conducted in Montana in 2006 and 2007. The PRE herbicides reduced the *C. sativa* stand 15 to 56% at the half rate and 17 to 70% at the full rate. The results of the experiments indicate that there are several herbicides that have the potential to be utilized for *C. sativa* control (WSSA, 2008).

Principal source:

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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ALIEN RANGE
[1] AUSTRALIA
[10] CANADA
[1] IRELAND
[1] JAPAN
[1] MEXICO
[1] SOUTHWESTERN ASIA
[39] UNITED STATES

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Weed Science Society of America (WSSA), 2008. WSSA Meeting Abstract: King, S. R. Montana State University, Huntley, MT *Camelina sativa* Tolerance to Preemergence and Postemergence Herbicide Applications.
Summary: Abstract: Camelina (*Camelina sativa*) together with other oilseed crops have garnered interest as potential sources of biodiesel. Experiments were conducted in 2006 and 2007 to determine herbicide tolerance of camelina. Two rates of eight preemergence (PRE) and ten postemergence (POST) herbicides were applied to camelina. PRE herbicides evaluated included: acetochlor, trifluralin, ethalfluralin, pendimethalin, triallate, metolachlor, sulfentrazone, and EPTC. POST herbicides evaluated included: fluroxypyr, bromoxynil, clopyralid, MCPA, 2,4-DB, bentazon, clethodim, sethoxydim, thifensulfuron, and tribenuron. PRE herbicides were applied prior to planting and POST herbicides were applied on 6 to 10 inch tall camelina plants. Camelina was seeded at 3 lb/A and treatments were replicated four times. The entire experiment was conducted weed-free in order to focus on herbicide tolerance. Treatments were compared to two nontreated controls. PRE herbicide injury typically was evident as stand reduction, while POST herbicide injury was recognizable as stunting/chlorosis. In both years at 6 weeks after preemergence treatment, stand reduction was less than 6% when trifluralin, ethalfluralin, pendimethalin, and triallate were applied at the full rate. Sulfentrazone completely eliminated camelina from treated plots regardless of rate. The other PRE herbicides reduced camelina stand 15 to 56% at the half rate and 17 to 70% at the full rate. In 2006, camelina seed yield, with the exception of sulfentrazone, did not differ from the nontreated controls regardless of rate. This result occurred because plants in plots treated with PRE herbicides that did survive became larger and produced more seed per plant compared to plants treated with herbicides that did not cause stand reduction. In 2007, camelina yield from plots treated with trifluralin, ethalfluralin, and pendimethalin were higher than yield from plots treated with acetochlor or triallate. In both years, stunting/chlorosis caused by applications of clopyralid, 2,4-DB, clethodim, and sethoxydim at 6 weeks after postemergence treatment was less than 6%. In both years, applications of either rate of thifensulfuron or tribenuron controlled camelina greater than 70%. Applications of MCPA controlled camelina from 56% with the half rate to 84% with the full rate. The other POST herbicides controlled camelina 8 to 40% at the low rates and 18 to 73% at the high rates. In both years, camelina in plots treated with clethodim, sethoxydim, and the low rate of bromoxynil produced yields equivalent to the nontreated controls. Plants in plots treated with clopyralid were essentially sterilized and did not produce seed. Results indicate that there are several herbicides that have the potential to be utilized in camelina for weed control, however additional research needs to be conducted to confirm these results.
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