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Database Name:

Medicago sativa - L.

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Alfalfa

Author L. Botanical references 17, 200
 Family [Leguminosae](#) Genus [Medicago](#)

Synonyms

Known Hazards



The plant contains saponin-like substances[222]. Eating large quantities of the leaves may cause the breakdown of red blood cells[222]. However, although they are potentially harmful, saponins are poorly absorbed by the human body and so most pass through without harm. Saponins are quite bitter and can be found in many common foods such as some beans. Thorough cooking, and perhaps changing the cooking water once, will normally remove most of them from the food. Saponins are much more toxic to some creatures, such as fish, and hunting tribes have traditionally put large quantities of them in streams, lakes etc in order to stupefy or kill the fish[K]. Alfalfa sprouts (and especially the seeds) contain canavanine. Recent reports suggest that ingestion of this substance can cause the recurrence of systemic lupus erythematosus (an ulcerous disease of the skin) in patients where the disease had become dormant[222].

Range Europe - Mediterranean. More or less naturalized in Britain[17].

Habitat Waste ground, avoiding acid soils[17].

Edibility Rating 4 (1-5)

Medicinal Rating 3 (1-5)

Physical Characteristics



Perennial growing to 1m at a medium rate.

It is hardy to zone 5. It is in flower from June to July, and the seeds ripen from July to September. The flowers are hermaphrodite (have both male and female organs) and are pollinated by Bees, Lepidoptera (Moths & Butterflies). The plant is self-fertile. It can fix Nitrogen. It is noted for attracting wildlife.

The plant prefers light (sandy), medium (loamy) and heavy (clay) soils, requires well-drained soil and can grow in nutritionally poor soil. The plant prefers acid, neutral and basic (alkaline) soils. It cannot grow in the shade. It requires dry or moist soil and can tolerate drought.

Habitats

Hedge; Cultivated Beds;

Cultivars: (as above except) 'Kansas'

Edible Uses

Edible Parts: [Leaves](#); [Seed](#).Edible Uses: [Tea](#).

Leaves and young shoots - raw or cooked[2, 8, 52, 145]. The leaves can also be dried for later use[55]. Very rich in vitamins[183], especially A, B and C[201], they are also a good source of protein[206]. The leaves are a rich source of vitamin K[213]. A very nutritious food in moderation, though it can trigger attacks in patients with systemic lupus erythematosus and large quantities can affect liver function and cause photosensitization[238]. A nutritional analysis is available[218]. The seed is commonly used as a sprouted seed which is added to salads[2, 20, 52], used in sandwiches etc or cooked in soups[183]. The seed is soaked in warm water for 12 hours, then kept moist in a container in a warm place to sprout. It is ready in about 4 - 6 days[244]. The seeds can also be ground into a powder and used as a mush, or mixed with cereal flours for making a nutritionally improved bread etc[183, 213, 244]. Seed yields average around 186 - 280 kilos per hectare[269]. An appetite-stimulating tea is made from the leaves[21, 55], it has a flavour somewhat reminiscent of boiled socks[144] and is slightly laxative[159].

Composition

Figures in grams (g) or milligrams (mg) per 100g of food.

Leaves (Fresh weight)

- 52 Calories per 100g
- Water: 82.7%
- Protein: 6g; Fat: 0.4g; Carbohydrate: 9.5g; Fibre: 3.1g; Ash: 1.4g;
- Minerals - Calcium: 12mg; Phosphorus: 51mg; Iron: 5.4mg; Magnesium: 0mg; Sodium: 0mg; Potassium: 0mg; Zinc: 0mg;
- Vitamins - A: 3410mg; Thiamine (B1): 0.13mg; Riboflavin (B2): 0.14mg; Niacin: 0.5mg; B6: 0mg; C: 162mg;
- Reference: [218]
- Notes:

Medicinal Uses

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[Anodyne](#); [Antibacterial](#); [Antiscorbutic](#); [Aperient](#); [Diuretic](#); [Emetic](#); [Febrifuge](#); [Haemostatic](#); [Nutritive](#); [Stimulant](#); [Tonic](#).

Alfalfa leaves, either fresh or dried, have traditionally been used as a nutritive tonic to stimulate the appetite and promote weight gain[222]. The plant has an oestrogenic action and could prove useful in treating problems related to menstruation and the menopause[254]. Some caution is advised in the use of this plant, however. It should not be prescribed to people with auto-immune diseases such as rheumatoid arthritis[238]. See also the notes above on toxicity. The plant is antiscorbutic, aperient, diuretic, oxytotic, haemostatic, nutritive, stimulant and tonic[55, 165, 218]. The expressed juice is emetic and is also anodyne in the treatment of gravel[218]. The plant is taken internally for debility in convalescence or anaemia, haemorrhage, menopausal complaints, pre-menstrual tension, fibroids etc[238]. A poultice of the heated leaves has been applied to the ear in the treatment of earache[257]. The leaves can be used fresh or dried[238]. The leaves are rich in vitamin K which is used medicinally to encourage the clotting of blood[213]. This is valuable in the treatment of jaundice[213]. The plant is grown commercially as a source of chlorophyll and carotene, both of which have proven health benefits[222]. The leaves also contain the anti-oxidant tricinin[222]. The root is febrifuge and is also prescribed in cases of highly coloured urine[218]. Extracts of the plant are antibacterial[218].

Other Uses

[Biomass](#); [Dye](#); [Green manure](#); [Hedge](#); [Oil](#); [Paper](#).

Often grown as a green manure. It is a bit slow to establish in its first year so is generally only recommended for positions where it can remain for 2 or more years. Alfalfa is very vigorous from its second year, producing a huge bulk of material that can be cut down 2 or 3 times during the season[20, 87]. Plants are very deep rooting, descending 6 metres or more into the soil[200], and are able to fix large quantities of atmospheric nitrogen, this makes them one of the very best green manures. Plants are rather intolerant of competition from grass etc, however, and there is the drawback of needing to leave them in the soil for more than 2 years to fully achieve their potential[K]. Alfalfa is a potentially excellent source of biomass. It is possible to produce more than 2 tonnes of protein from the leaves (suitable for human use) per hectare per year. In addition, the plant residues remaining could be used to produce the equivalent of about 10 barrels of oil per year[269]. A yellow dye is obtained from the seed[269]. The fibre of the plant has been used in making paper[269]. The seed yields about 8.5 - 11% of a drying oil. It is used in paints, varnish etc[46, 57, 61, 269]. The plant can be grown as a low dividing hedge in the vegetable garden[52, 206].

Cultivation details

Alfalfa is a very versatile plant that can adapt to a wide range of climatic conditions from cold temperate to warm sub-tropical.[269]. It succeeds on a wide variety of soils[52, 269], but thrives best on a rich, friable, well-drained loamy soil with loose topsoil supplied with lime[269]. It does not tolerate waterlogging and fails to grow on acid soils[269]. Grows well on light soils[206]. The plant has a deep taproot and, once established, tolerates drought and extremely dry conditions[52, 269]. Prefers a neutral fertile soil[87] but succeeds in relatively poor soils so long as the appropriate Rhizobium bacteria is present[200]. A good bee plant[46] and a food plant for many caterpillars[30]. Alfalfa is a very deep rooting plant, bringing up nutrients from deep in the soil and making them available for other plants with shallower root systems. It is a good companion plant for growing near fruit trees and grape vines so long as it is in a reasonably sunny position, but it does not grow well with onions or other members of the Allium genus[201]. Growing alfalfa encourages the growth of dandelions[201]. Alfalfa has long been cultivated for its edible seed, which can be sprouted and eaten in salads. It is also grown as a green manure and soil restorer. There are many named varieties[183]. Botanists divide the species into a number of sub-species - these are briefly described below: - *M. sativa caerulea* (Less. ex Ledeb.)Schmalh. This sub-species is likely to be of value in breeding programmes for giving cold tolerance, drought resistance and salt tolerance to alfalfa. *M. sativa falcata* (L.)Arcang. This sub-species is likely to be of value in breeding programmes for giving cold tolerance, drought and disease resistance plus salt and water-logging tolerance to alfalfa. *M. sativa sativa*. The commonly cultivated form of alfalfa. *M. sativa varia* (Martyn.)Arcang. This sub-species is likely to be of value in breeding programmes for giving cold tolerance, drought resistance and high yields to alfalfa. This species has a symbiotic relationship with certain soil bacteria, these bacteria form nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant but some can also be used by other plants growing nearby[200].

Propagation

Pre-soak the seed for 12 hours in warm water and then sow in spring in situ. The seed can also be sown in situ in autumn[52]. Seed can be obtained that has been inoculated with Rhizobium bacteria, enabling the plant to succeed in soils where the bacteria is not already present.

Cultivars

'Iroquois'

A very winter-hardy form, resistant to bacterial wilt[183]. Requires good drainage and a minimum pH of 6.5 with adequate potash and phosphorous[183]. Seeding rate is 16 - 21 kilos per hectare[183].

'Kansas'

An extremely hardy wild and drought resistant form that has been successfully grown in all climates[183]. An excellent soil improver[183]. Seeding rate is 16 - 27 kilos per hectare[183].

'Ranger'

A very hardy form that is resistant to bacterial wilt[183]. When used for making sprouts, it has lower fresh-weight yields and higher protein percentage[183]. Requires a well-drained soil and a pH no lower than 6.5[183]. Sowing rate 16 - 21 kilos per hectare[183].

'Vernal'

A hardy, heavy-yielding cultivar that is resistant to bacterial wilt[183]. It withstands early and frequent cuttings[183].

Links

This plant is also mentioned in the following PFAF articles: [Staple seed crops from perennials.](#)

References

[K] **Ken Fern**

Notes from observations, tasting etc at Plants For A Future and on field trips.

[2] **Hedrick. U. P.** *Sturtevant's Edible Plants of the World*. Dover Publications 1972 ISBN 0-486-20459-6

Lots of entries, quite a lot of information in most entries and references.

[8] **Ceres**. *Free for All*. Thorsons Publishers 1977 ISBN 0-7225-0445-4
Edible wild plants in Britain. Small booklet, nothing special.

[17] **Clapham, Tootin and Warburg**. *Flora of the British Isles*. Cambridge University Press 1962
A very comprehensive flora, the standard reference book but it has no pictures.

[20] **Riotte, L.** *Companion Planting for Successful Gardening*. Garden Way, Vermont, USA. 1978 ISBN 0-88266-064-0
Fairly good.

[21] **Lust, J.** *The Herb Book*. Bantam books 1983 ISBN 0-553-23827-2
Lots of information tightly crammed into a fairly small book.

[30] **Carter D.** *Butterflies and Moths in Britain and Europe*. Pan 1982 ISBN 0-330-26642-x
An excellent book on Lepidoptera, it also lists their favourite food plants.

[46] **Uphof, J. C. Th.** *Dictionary of Economic Plants*. Weinheim 1959
An excellent and very comprehensive guide but it only gives very short descriptions of the uses without any details of how to utilize the plants. Not for the casual reader.

[52] **Larkcom, J.** *Salads all the Year Round*. Hamlyn 1980
A good and comprehensive guide to temperate salad plants, with full organic details of cultivation.

[55] **Harris, B. C.** *Eat the Weeds*. Pivot Health 1973
Interesting reading.

[57] **Schery, R. W.** *Plants for Man*. 0
Fairly readable but not very comprehensive. Deals with plants from around the world.

[61] **Usher, G.** *A Dictionary of Plants Used by Man*. Constable 1974 ISBN 0094579202
Forget the sexist title, this is one of the best books on the subject. Lists a very extensive range of useful plants from around the world with very brief details of the uses. Not for the casual reader.

[87] **Woodward, L. Burge, P.** *Green Manures*. Elm Farm Research Centre. 1982
Green manure crops for temperate areas. Quite a lot of information on a number of species.

[144] **Cribb, A. B. and J. W.** *Wild Food in Australia*. Fontana 1976 ISBN 0-00-634436-4
A very good pocket guide.

[145] **Singh, Dr. G. and Kachroo, Prof. Dr. P.** *Forest Flora of Srinagar*. Bishen Singh Mahendra Pal Singh 1976

A good flora of the western Himalayas but poorly illustrated. Some information on plant uses.

[159] **McPherson, A. and S.** *Wild Food Plants of Indiana*. Indiana University Press 1977 ISBN 0-253-28925-4
A nice pocket guide to this region of America.

[165] **Mills, S. Y.** *The Dictionary of Modern Herbalism*. 0
An excellent small herbal.

[183] **Facciola, S.** *Cornucopia - A Source Book of Edible Plants*. Kampong Publications 1990 ISBN 0-9628087-0-9
Excellent. Contains a very wide range of conventional and unconventional food plants (including tropical) and where they can be obtained (mainly N. American nurseries but also research institutes and a lot of other nurseries from around the world).

[200] **Huxley, A.** *The New RHS Dictionary of Gardening*. 1992. MacMillan Press 1992 ISBN 0-333-47494-5
Excellent and very comprehensive, though it contains a number of silly mistakes. Readable yet also very detailed.

[201] **Allardice, P.** *A - Z of Companion Planting*. Cassell Publishers Ltd. 1993 ISBN 0-304-34324-2
A well produced and very readable book.

[206] **Larkcom J.** *Oriental Vegetables* John Murray 1991 ISBN 0-7195-4781-4
Well written and very informative.

[213] **Weiner, M. A.** *Earth Medicine, Earth Food*. Ballantine Books 1980 ISBN 0-449-90589-6
A nice book to read though it is difficult to look up individual plants since the book is divided into separate sections dealing with the different medicinal uses plus a section on edible plants. Common names are used instead of botanical.

[218] **Duke, J. A. and Ayensu, E. S.** *Medicinal Plants of China* Reference Publications, Inc. 1985 ISBN 0-917256-20-4
Details of over 1,200 medicinal plants of China and brief details of their uses. Often includes an analysis, or at least a list of constituents. Heavy going if you are not into the subject.

[222] **Foster, S. & Duke, J. A.** *A Field Guide to Medicinal Plants. Eastern and Central N. America*. Houghton Mifflin Co. 1990 ISBN 0395467225
A concise book dealing with almost 500 species. A line drawing of each plant is included plus colour photographs of about 100 species. Very good as a field guide, it only gives brief details about the plants medicinal properties.

[238] **Bown, D.** *Encyclopaedia of Herbs and their Uses*. Dorling Kindersley, London. 1995 ISBN 0-7513-020-31
A very well presented and informative book on herbs from around the globe. Plenty in it for both the casual reader and the serious student. Just one main quibble is the silly way of having two separate entries for each plant.

[244] **Phillips, R. & Foy, N.** *Herbs* Pan Books Ltd. London. 1990 ISBN 0-330-30725-8
Deals with all types of herbs including medicinal, culinary, scented and dye plants. Excellent photographs with quite good information on each plant.

[254] **Chevallier, A.** *The Encyclopedia of Medicinal Plants* Dorling Kindersley. London 1996 ISBN 9-780751-303148

An excellent guide to over 500 of the more well known medicinal herbs from around the world.

[257] **Moerman, D.** *Native American Ethnobotany* Timber Press. Oregon. 1998 ISBN 0-88192-453-9
Very comprehensive but terse guide to the native uses of plants. Excellent bibliography, fully referenced to each plant, giving a pathway to further information. Not for the casual reader.

[269] **Duke, J.** *Handbook of Energy Crops* - 1983

Published only on the Internet, excellent information on a wide range of plants.

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