

Cover Crop and Living Mulch Toolbox

Subsidiary Crops

Short term crops grown in-between or alongside main cash crop.

Not grown for direct economic benefit but primarily for their ecosystem services



Why use them?

One of the main aims of using cover crops and living mulches is to protect the soil and to improve overall soil fertility.

Other benefits include:

- Weed suppression
- Improved soil structure
- Adding OM to soils
- Biodiversity
- Improved productivity



Species choice

Farmers and growers tend to use the same few tried and tested species as cover crops and living mulches.

And why change it?





An online toolbox for cover crop and living mulches

Sally Westaway

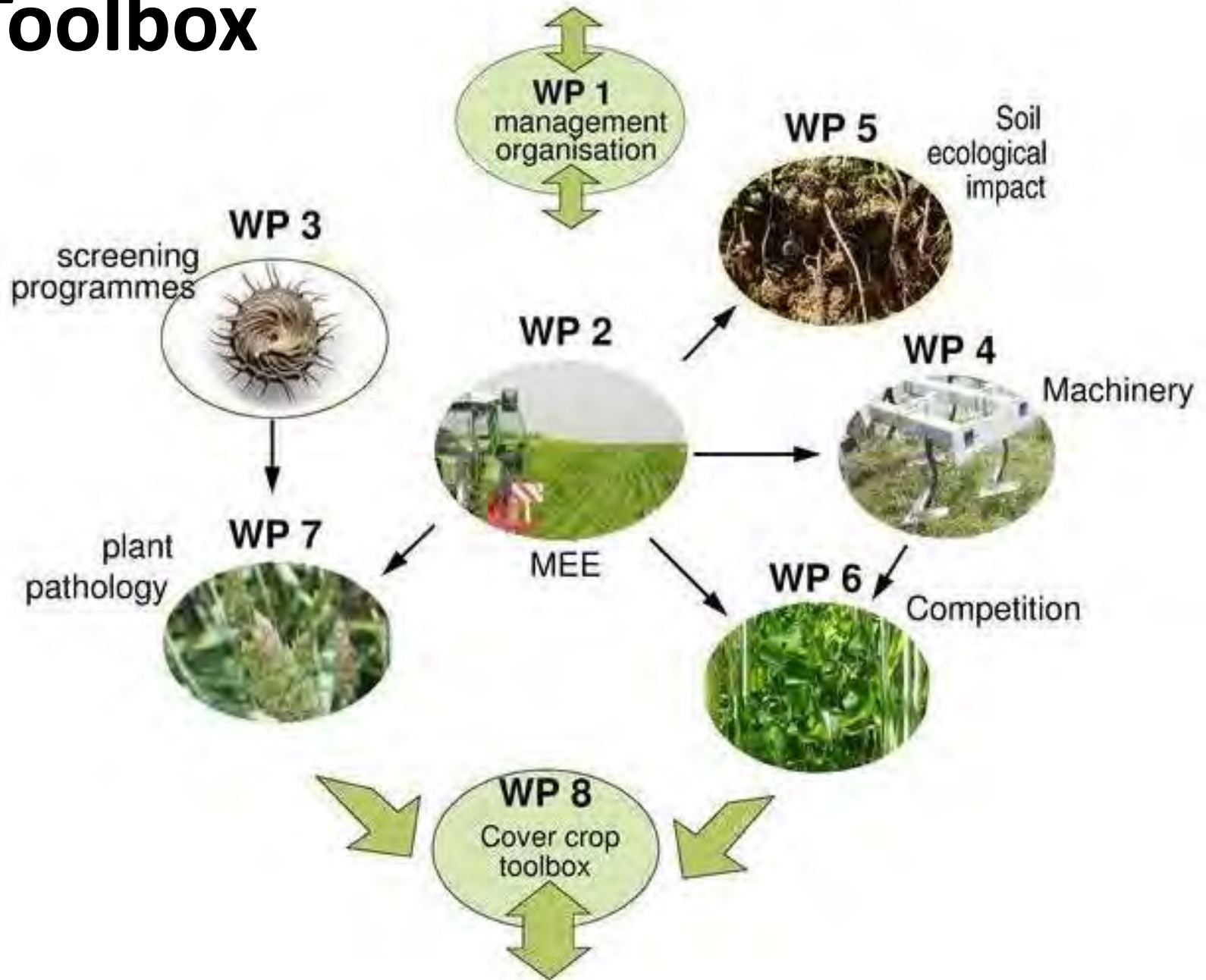
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Toolbox



www.covercrops.eu



The Cover Crop and Living Mulch Toolbox

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OSCAR portal

Welcome to the OSCAR Living Mulch and Cover Crop Toolbox; providing tools to help improve knowledge and drive the use of Conservation Agriculture practices and subsidiary cropping systems throughout Europe

The aims of the Toolbox are to:

- Make scientific literature and technical information on cover crops and living mulches widely available
- Promote the current knowledge and impact of innovative subsidiary cropping systems and potential solutions to ecological problems

The Toolbox will help you:

- Identify suitable cover crop and living mulch species and varieties and appropriate species mixtures
- Locate and access information on appropriate machinery
- Access the best current practical advice about management issues
- Identify economic considerations of subsidiary crop based systems



Wiki



A '**Wiki**' is an online database collaboratively developed by a community of users where all are able to add to and edit its content

The OSCAR Wiki

- Interactive, user-fed knowledge source of regionally relevant information on:
 - Subsidiary crop species
 - Machinery and methods
 - Farm case studies
- Constantly evolving through contributions
 - Adding comments
 - Editing pages
 - Uploading images
 - Creating pages
 - Translating pages
 - Growers experiences





Main Page

Translate this page

Other languages: Deutsch • English • español • français • italiano • polski • português do Brasil

Welcome to the Cover Crop and Living Mulch Wiki

[edit]



Welcome to the Cover Crop and Living Mulch wiki site. This wiki is an interactive user-fed knowledge source of regionally relevant information (text, images and videos) concerning leguminous and non-leguminous subsidiary crop species, species mixtures, machinery and farm case studies.

Information included in this wiki comes from personal experience reports, from the scientific literature, and the experiments conducted in The OSCAR Project.

This wiki is a living document that evolves through input from participants. The success of the wiki will depend upon contributions from registered users modifying and adding new entries. We encourage all users with an interest in the site to sign up and start contributing.

Please use the menus on the left toolbar to navigate the site.

Thank you for your input!



Birdsfoot trefoil



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 289277



Black medic, *Medicago lupulina*

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Species information

Crimson clover

This page contains changes which are not marked for translation.

Trifolium incarnatum

Other languages:

Deutsch • English • español • français • italiano



Crimson clover is a short-term nitrogen fixer. It is an annual species characterised by a vigorous establishment phase and high forage production. It shows adaptability to a wide range of soils.

Contents [hide]

- 1 *Trifolium incarnatum*
- 2 Description
- 3 Distribution
- 4 Benefits at a subsidiary crop
- 5 Growers experiences
- 6 References

Description

Crimson clover is self-fertile and pollinated by bumblebees and honey bees (Blake & George, 1958). The species has relatively large seeds which may contribute to its strength as an early developer (Evers, 1999; Kahnt, 2008). The plants are often slightly taller than red clover but range in height from 30-100cm (Knight et al., 2008; Kahnt, 2008).

Crimson clover is characterised by a high production of soft seed (Bennett, 1959) therefore germination can occur in summer rather than in the autumn, thus limiting optional, timely self-reseeding (Hoveland & Evers, 1995)

Distribution


















It is a winter-annual grown for forage in Europe (Knight & Hollowell, 1973; Knight, 1985). The species can be used as a summer annual for green manure in cooler, northern latitudes (Hoveland & Evers, 1995). The species is adapted to a wide range of soil and climatic conditions, more so than other frequently used annual forage legumes. The target soil pH is given as 6.0–7.0 (FAO, 2000) or 5.5–6.5 (Kahnt, 2008). Crimson clover will grow on soils of low fertility but benefits from good soil phosphorus status (Knight & Hollowell, 1973). The species shows low to medium tolerance to drought (Kahnt, 2008). It is considered to be only moderately winter hardy (Kahnt, 2008). After establishment, crimson clover makes more growth at low temperatures than many other clovers (Knight & Hollowell, 1973).

Benefits at a subsidiary crop

Crimson clover is considered to be suitable for hay and silage especially at leafy growth stage because it provides protein rich forage. It shows very strong regrowth after the first cut. However it is known to show relatively poor regrowth after grazing (Doring et al., 2013). For this reason it is recommended that close grazing should be avoided in winter so as not to affect spring growth or seed production adversely. It is a good weed competitor up until flowering when its canopy is reduced. Crop cover can be low but biomass production is often similar to white clover. Early maturity makes it highly suitable for no-tillage rotations.

Probably because of susceptibility to clover diseases, it is recommended to have 3 break years in between growing crimson clover (Kahnt, 2008). In mixtures, crimson clover is usually combined with various grasses such as perennial ryegrass but also wheat and rye; a good companion legume species is red clover (Knight & Hollowell, 1973).

Crimson clover is self-fertile it is also pollinated by bumblebees and honey bees (Blake & George, 1958).

Benefits		
		
		
		
		
Cost		
		
Cover crop	Living mulch	
		

How to edit the wiki

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OSCAR WP8 'Editing the wiki'

How to edit the OSCAR cover crops and living mulches wiki page

Wiki address

www.covercrops.eu (which will redirect to)
http://web3.wzw.tum.de/oscar/wiki/index.php/Main_Page



Register

Click on 'Create account'
 Designate yourself a username + password.
 Insert your email address.
 Click on the link sent to your email address to confirm registration.

*Some of the editing rights are reserved and therefore must be requested. Send requests (include details of your name and your chosen wiki username) to:
henry.c@organicresearchcentre.com

Editing pages

1. Click the "edit" at the top of the page.
2. Make changes to the text.
3. Click the "save" button.



Please Register!

- In the top right of the page click on ‘**Create account**’
- Designate yourself a username + password



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Special page

Log in / create account

Create account

Already have an account? [Log in.](#)

Username:

Use a temporary random password and send it to the specified email address

Password:

Retype password:

Email:

Email address is optional, but is needed for password resets, should you forget your password.

You can also choose to let others contact you by email through a link on your user or talk page. Your email address is not revealed when other users contact you.

Real name:

Real name is optional. If you choose to provide it, this will be used for giving you attribution for your work.

Reason:

Remember my login on this browser (for a maximum of 180 days)

Species Database

Results of the OSCAR subsidiary crop screening trials and other screening programmes.

Contains information commonly used subsidiary crop species as well as less familiar, often not cultivated species.

Both species with good potential and those revealed not to be so promising.



Subsidiary Crop Database

OSCAR Subsidiary Crop Database



Subsidiary Crop Database

Home

List of Scientific Names

Lists of Common Names

English

Italian

German

Spanish

French

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List of Species

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Onobrychis vicifolia Scop.
Amoria glomerata (L.) Sojak
Astragalus hamosus L.
Astragalus pelecinus (L.) Barneby subsp. pelecinus;
Biserrula pelecinus L.
Biserrula pelecinus L. subsp. dalmatica Trinajstic
Brassica napus L.
Brassica rapa L.
Chrysaspis campestris Desv.
Chrysaspis dubia (Sibth.) E.H. Greene
Cracca atropurpurea (Desf.) Gren. & Godr
Dactylis glomerata L.
Ervilia sativa Link
Ervum ervilia L.
Fagopyrum esculentum Moench
Hedysarum coronarium L.
Hippocrepis biflora Sprengel
Hippocrepis unisiliquosa L.
Lathyrus articulatus L.
Lathyrus aphaca L.
Lathyrus articulatus L.
Lathyrus Chloranthus Boiss.
Lathyrus Chlymensum L.
Lathyrus ochrus (L.) DC
Lathyrus sativus L.
Lens pygmaea Grossh.
Lolium multiflorum Lam.
Lotus corniculatus
Medicago ciliaris (L.) Krock
Medicago disciformis DC.
Medicago apiculata Willd.
Medicago applanata Hornem.

List of Species (English Names)

Help

Alfalfa
Alsike clover
Annual ryegrass
Ball Clover
Barley
Barrel clover
Barrel medick
Beerseem clover
Birdsfoot trefoil
Bitter vetch
Black medick
Blue sweet pea
Brown mustard
Buckwheat
Bur clover
Bur medick
Button clover
Button medick
Calvary clover
Calvary medick
Camelina
Cereal rye
Chickling vetch
Chicory
Ciliate medick
Cluster Clover
Coastal medick
Cocksfoot
Common vetch
Crimson clover
Crown medick

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Scorpiurus muricatus L.



Scorpiurus muricatus: Ripe pods

(For information on the images hover the mouse cursor, for a full sized view click onto the images.)

Common Names

Prickly caterpillar (*English*)

Skorpionsschwanz (*German*)

[More Details in the the '*Cover Crop and Living Mulch Wiki*'](#)

Botanical Description

A self-reseeding annual legume widely distributed in natural pastures of the Mediterranean area. No genuine stem, but branches that, starting from cotyledonary node, spread out radially over the ground (Dormer, 1945); height 60–65 cm. Leaves simple, oblong, solitary or alternate-opposing 1–2 cm wide, 4–7 cm long, with long and sharp stipules. The inflorescence (usually 2–5 flowers) has a long sharp-edged peduncle and very small light-coloured bracts. The small flowers are initially yellow and turn to red at maturation. The pod has 8–12 longitudinal ridges with hooked spines, varying in colour from straw-yellow to dark violet in the part exposed to the sun.

Uses and Cultivation

Occurs spontaneously on Mediterranean pastures, appreciated by farmers for its productivity, forage quality and palatability. A cultivar ("Haffouz") has been released in Tunisia. The species has also been tested as a living mulch for wheat and teff in the highlands of Ethiopia (Pülschen 1992, *Journal of Agronomy and Crop Science* Vol. 168)

Discussion of the Evaluation Results

Relatively good overwintering; High biomass production in Mediterranean areas, but much less in Germany.

Evaluation Trials

List of all evaluation trials with available data, showing trial location and timeframe. Detailed reports of the trials can be downloaded here.

Institute	Years	Location	Climate	Project	
Technische Universität München	2002-2015	Freising (Germany) (Germany)	Temperate	OSCAR	View Report
Technische Universität München	2012-2014	Freising (Germany) (Germany)	Temperate	OSCAR	View Report
Università della Tuscia	2012-2014	Viterbo (Italy)	Mediterranean	OSCAR	View Report
PH Petersen	2012-2014	Flensburg (Germany) (Germany)	Temperate	OSCAR	View Report
Universität Kassel	2012-2014	Witzenhausen (Germany) (Germany)	Controlled conditions	OSCAR	View Report
Organic research Center		Elm Farm research station (UK)	Oceanic	OSCAR	View Report

Evaluation Summary

Summary of the evaluation results per species across all accessions and locations. These are of particular interest to give an idea of the potential of less known species. Results concerning single accessions are reported in the table below

Data Source	TUM
Biomass	5
Growth Habit Isolated	3
Growth Habit in competition	1
Canopy Height	2
Weed Suppression	5
Lodging	8
Leaf Size	7
Stem Diameter	5
Tillering	8
Persistence	5

Decision Support Tool

- This practical tool allows users to search the database for cover crop and living mulch species according to geographical region, soil, and crop characteristics and use.
- The search generates a set of plant profiles to fit these user defined specifications and allows for the comparison of the species properties.



Decision Support Tool

Here you can search our database for information on cover crop and living mulch species throughout Europe, and discover species characteristics that can help inform your choice of species and potentially to identify new species to trial on your farm.

The tool takes you through a series of questions which will help determine your requirements in relation to geographical region, soil, and crop characteristics and use. This will generate a set of plant profiles that fall within your specifications and allow you to compare the properties of different species.

The resulting species list contains all species in our database ordered by their relevance to your requirements; i.e. the most relevant species will appear on the top, the least relevant at the end of the list.


The data has been collated from published literature, existing databases, and from the [OSCAR cover crop and living mulch database](#)


[Enter The Tool Now!](#)


We are always interested to hear about related research, addition information as well as any corrections or clarifications to the contents of this toolbox. Please get in touch with Peter Baresel baresel@wzw.tum.de


Select species requirements


Geographical region? 


 High biomass
 Medium biomass
 Not required


 Good weed suppression
 Some weed suppression
 Not required


 Important
 Less important
 Not required


 Fast (i.e. annual clovers)
 Steady
 Slow (i.e. grasses)


 Good disease suppression
 Less important
 Not required


 High cold tolerance needed
 less important
 Not required


 Good adaptation needed
 Less important
 Not required


 Good adaptation needed
 Less important
 Not required


 Deep root system needed
 Less important
 Not required

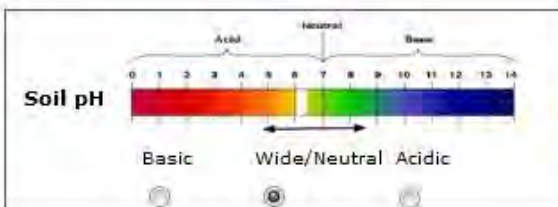
 Has to be suitable
 Less important
 Not required

 Has to be suitable
 Less important
 Not required
 As a living

 Has to be suitable
 Less important
 Not required
 As a cover

 Has to be suitable
 Less important conditions
 Not required
 As an undersown

 Has to be suitable
 Less important
 Not required
 As a whole season crop



Submit search



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Common Name	Scientific name	Weighted Overall Score	
Hairy vetch	<i>Vicia villosa</i> Roth	360	Details
Purple vetch	<i>Vicia benghalensis</i> Roth	360	Details
White clover	<i>Trifolium repens</i> L.	360	Details
Alfalfa	<i>Medicago sativa</i> L.	360	Details
Crimson clover	<i>Trifolium incarnatum</i> L.	350	Details
Italian ryegrass	<i>Lolium multiflorum</i> Lam.	350	Details
Red clover	<i>Trifolium pratense</i> L.	340	Details
Common vetch	<i>Vicia sativa</i> L.	320	Details
Brown mustard	<i>Brassica juncea</i> L.	320	Details
Subterranean clover	<i>Trifolium subterraneum</i> L.	310	Details
Alsike clover	<i>Trifolium hybridum</i> L.	310	Details
Sainfoin	<i>Onobrychis viciifolia</i> Scop.	300	Details
Hungarian vetch	<i>Vicia pannonica</i> Roth	290	Details
Grazing rye	<i>Secale cereale</i> L.	290	Details

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Hungarian vetch



(For information on the images hover the mouse cursor, for a full sized view click onto the images.)

Scientific names

Vicia pannonica Crantz

Common Names

Hungarian vetch *(English)*

Pannonische Wicke *(German)*

Ungarische Wicke *(German)*

Uses and Cultivation

Hungarian Vetch

Scores of the most important characteristics

Biomass	8
N supply	8
Disease suppression	0
Cold tolerance	7
Suitability for sandy soils	6
Suitability for clay soils	8
Rooting depth	6
Suitability as living mulch	1
Suitability as cover crop	9
Suitability for undersowing	1
Suitability as whole-season crop	6
Crop Healthiness	3
Establishment	8

Hairy vetch (*Vicia villosa*)

Widely grown in
Mediterranean and
US as winter cover
crop



Purple vetch (*Vicia benghalensis*)

Revealed to be one of the most productive species in our screening



Future development

A wide-angle photograph of a lush green field of cover crops. The plants are tall and dense, with many small, round flowers in shades of pink, purple, and white. The field extends to a distant treeline under a bright blue sky with scattered white clouds. In the background, a red tractor is visible near a wooden structure.

www.covercrops.eu



Any Questions?

Workshop

You will require:

- Laptop + internet access
- Go to www.covercrops.eu

Workshop ideas

- Editing wiki – adding info, creating a page, translating (see Henry's ppt for example)
- Database
- Decision Support Tool