

## Commonly used cover crop species

There are various crop alternatives to be used as vegetative cover, such as grains, legumes, root crops and oil crops. All of them are of great benefit to the soil, however some cover crops have certain attributes, which need to be kept in mind when planning a rotation scheme. It is important to start the first years of conservation agriculture with cover crops that leave a lot of residues on the soil surface, which decompose slowly (because of the high C/N ratio). Grasses and cereals are most appropriate for this stage, also because of their aggressive and abundant rooting system, which take less time to improve the soil.

In the following years, when the soil shows a healthier appearance, legume cover crops can be incorporated in the rotation. Leguminous crops enrich the soil with nitrogen and decompose rapidly because of low C/N ratio. Later, when the system is stabilized it is possible to include cover crops with an economic function, like livestock fodder.

When a farmer considers using cover crops, it is important to know:

- Whether it needs to have more benefits (e.g. edible seeds, fodder value).
- Which of the available cover crops is the most appropriate.
- When to sow and control the cover crop.
- Whether the cover crop needs a lot of water, and if this will be available.
- If it is possible to control the cover crop sufficiently, so that it doesn't turn into a weed.
- Whether the cover crop provides the same benefits as a rotation with only commercial crops (e.g. immediately following a cereal crop with a commercial legume).

In order to be able successfully to integrate cover crops in the CA production system, it is crucial to select the plants that are adapted to the different soil and climatic conditions and that have growth characteristics that allow it to fit in the rotation scheme. For this, it is not only necessary to be conversant with the agronomic details of the species, but also all specific conditions of the site where they will be sown (soil and climate) and the anticipated objectives and socio-economic conditions of the farmers.

The species that will be used as cover crops need to be tested and validated by the farmers on their land in order for them to get acquainted with the technical details of the plant species.

The selection of cover crops should depend on the following criteria:

- The presence of high levels of lignin and phenolic acids, which give the residues a higher resistance to decomposition and thus results in soil protection for a longer period.
- Time of sowing. Many species show dormancy or photoperiodism. This means that the production of biomass depends on the period of the year in which the plant is sown. Seeding should be done in the proper season. In order not to jeopardize the following crops, a good planning of the cover crops is necessary.
- A proper spacing / density of the cover crop is important in order to create a rapid covering of the surface to protect the soil from rain and sun and to suppress the weeds.
- Soil management: for seeding of the cover crop no land preparation is needed.
- Cover crops can be sown either using direct seeding or broadcast over the stubble of the last crop, possibly using a tree trunk, knife-roller, disc harrow used as roller with

the discs set at a disc angle close to 0° or chains for putting the seeds into contact with the soil. Some species, like hairy vetch, have the ability to reseed themselves.

- Seed quality: like in commercial crops, the seeds or planting material of cover crops need to be of high quality and free of pathogens to avoid failure through low quality seeds.

#### Agroecological adaptation of most commonly used cover crops

Scientific name	English	Spanish
<b>Legumes adapted to humid lowlands</b>		
<i>Centrosema pubescens</i>	Centro, butterfly pea	Jetirana, bejuco de chivo
<i>Phaseolus mungo</i>	Black gram	.
<i>Pueraria phaseoloides</i>	Tropical kudzu	Kudzú tropical
<b>Legumes adapted to fire</b>		
<i>Centrosema pubescens</i>	Centro, butterfly pea	Jetirana, bejuco de chivo
<i>Desmodium adscendens</i>	.	.
<i>Glycine wightii</i>	Glycine	Soja perenne
<i>Macroptilium atropurpureum</i>	Siratro	Siratro
<b>Legumes adapted to cold conditions</b>		
<i>Clitoria ternatea</i>	butterfly pea	Campanilla, zapallito de la reina
<i>Desmodium intortum</i>	Greenleaf desmodium	Pega-pega
<i>Desmodium incinatum</i>	.	.
<i>Glycine wightii</i>	Glycine	Soja perenne
<i>Lotononis bainesii</i>	Lotononis	Lotononis, Miles lotononis
<i>Medicago sativa</i>	Lucerne	Alfalfa
<i>Phaseolus lathyroides</i>	Phasey bean	Frijol de monte, frijol de los arrozales
<i>Trifolium spp.</i>	Clover	Trébol
<b>Legumes adapted to frequently flooded or inundated areas</b>		
<i>Lotononis bainesii</i>	Lotononis	Lotononis, Miles lotononis
<i>Phaseolus lathyroides</i>	Phasey bean	Frijol de monte, frijol de los arrozales
<i>Pueraria phaseoloides</i>	Tropical kudzu	Kudzú tropical
<i>Vigna luteola</i>	Dalrymple vicia	.
<i>Vigna umbellata</i>	Rice bean	.
<b>Legumes that tolerate drought</b>		
<i>Cajanus cajan</i>	Pigeon pea	Guandul
<i>Canavalia brasiliensis</i>	.	.
<i>Canavalia ensiformis</i>	Jack bean, sword bean	Canavalia
<i>Clitoria ternatea</i>	butterfly pea	Campanilla, zapallito de la reina
<i>Desmanthus virgatus</i>	.	.
<i>Desmodium uncinatum</i>	Silverleaf desmosium	.
<i>Dolichos lablab</i>	Lablab bean	Frijol caballo, gallinita
<i>Galactia striata</i>	.	Frijolillo, Galactia
<i>Glycine wightii</i>	Glycine	Soja perenne
<i>Indigofera endecaphylla</i>	.	Indigo

<i>Leucaena endecaphylla</i>	.	.
<i>Macrotyloma axillare</i>	Archer axillaris	.
<i>Stylosanthes guyanensis</i>	Common stylo, tropical lucerne	Alfalfa de Brasil
<i>Stylosanthes hamata</i>	Caribbean stylo, pencil flower	Tebeneque
<i>Stylosanthes humilis</i>	Townsville stylo, wild lucerne	Alfalfa salvaje
<i>Stylobium spp.</i>	Mucuna, velvet bean	Frijol terciopelo
<i>Vigna unguiculata</i>	Cowpea	Caupi

#### Legumes adapted to shade

<i>Arachis pintoi</i>	Horse groundnut	Mani forajera
<i>Calopogonium mucunoides</i>	Calapo	Rabo de iguana
<i>Canavalia ensiformis</i>	Jack bean, sword bean	Canavalia
<i>Indigofera spp.</i>	.	Indigo
<i>Leucaena leucocephala</i>	Leucaena	Leucena, acacia bella rosa, aroma blanca
<i>Pueraria phaseoloides</i>	Tropical kudzu	Kudú tropical
<i>Trifolium repens</i>	White clover	Trébol blanco

#### Legumes adapted to fertile soils

<i>Glycine wightii</i>	Glycine	Soja perenne
<i>Medicago sativa</i>	Lucerne	Alfalfa
<i>Stylobium deeringianum</i> (=	Mucuna, Velvet bean	Frijol terciopelo
<i>Mucuna pruriens</i> )	Mucuna,	
<i>Trifolium spp.</i>	Clover	Trébol
<i>Vicia sativa</i>	Common vetch	Arveja comun
<i>Vicia villosa</i>	Hairy vetch	Veza peluda

#### Legumes adapted to medium fertile soils

<i>Centrosema pubescens</i>	Centro, butterfly pea	Jetirana, bejuco de chivo
<i>Galactia striata</i>	.	Frijolillo, Galactia
<i>Macroptilium atropurpureum</i>	Siratro	Siratro
<i>Lupinus albus</i>	White lupin	Lupino blanco
<i>Lupinus angustifolius</i>	Blue lupin	Lupino azul
<i>Lathyrus sativus</i>	Grass pea, chickling pea	guija
<i>Crotalaria juncea</i>	Sunn-hemp	Crotalaria

#### Legumes and other species tolerant to low soil fertility

<i>Cajanus cajan</i>	Pigeon pea	Guandul
<i>Calopogonium mucunoides</i>	Calapo	Rabo de iguana
<i>Canavalia brasiliensis</i>	.	.
<i>Canavalia ensiformis</i>	Jack bean, sword bean	Canavalia
<i>Centrosema spp.</i>	Centro, butterfly pea	Jetirana, bejuco de chivo
<i>Desmodium spp.</i>	Desmodium	Pega-pega
<i>Galactia striata</i>	.	Frijolillo, Galactia
<i>Indigofera spp.</i>	.	Indigo
<i>Leucaena leucocephala</i>	Leucaena	Leucena
<i>Lotus corniculatus</i>	Birdsfoot trefoil	.
<i>Lupinus luteus</i>	Yellow lupin	Lupino amarillo
<i>Macroptilium atropurpureum</i>	Siratro	Siratro
<i>Stylosanthes spp.</i>	Stylo	.

<i>Stylozobium aterrimum</i>	Black mucuna	Frijol terciopelo negro
<i>Teramnus uncinatus</i>	.	Mani de venado
<i>Vicia villosa</i>	Hairy vetch	Arveja pelluda
<i>Vigna unguiculata</i>	Cowpea	Caupi
<i>Zornia diphlla</i>	Zornia	Zornia, barba de burro
<i>Lolium multiflorum</i>	Italian ryegrass	.
<i>Ornithopus sativus</i>	Pink serradella, bird's foot	.
<i>Secale cereale</i>	Rye	Centeno
<i>Spergula arvensis</i>	Corn spurry, spurry	Linacilla

## Legumes for the tropics and subtropics

The following legumes have been planted in the tropics and subtropics:

[Axillaris](#) (*Macrotyloma axillare*)  
[Burgundy Bean](#) (*Macroptilium bracteatum*)  
[Butterfly Pea](#) (*Clitoria ternatea*)  
[Calliandra](#) (*Calliandra calothyrsus*)  
[Calopo](#) (*Calopogonium mucunoides*)  
[Cassia, Round-leaf](#) (*Chamaecrista rotundifolia* - *Cassia rotundifolia*)  
[Centro](#) (*Centrosema pubescens*)  
[Centro, Centurion](#) (*Centrosema pascuorum*)  
[Clitoria](#) (*Clitoria ternatea*)  
[Clover, Kenya white](#) (*Trifolium semipilosum*)  
[Clover, Subterranean](#) (*Trifolium subterraneum*)  
[Clover, White](#) (*Trifolium repens*)  
[Desmanthus](#) (*Desmanthus virgatus*)  
[Desmodium, Greenleaf](#) (*Desmodium intortum*)  
[Desmodium, Silverleaf](#) (*Desmodium uncinatum*)  
[Dolichos uniflorus](#) (now *Macrotyloma uniflorum*)  
[Glycine](#) (*Neonotonia wightii*)  
[Hetero](#) (*Desmodium heterophyllum*)  
[Jointvetch, American](#) (*Aeschynomene americana*)  
[Jointvetch, Bargoo](#) (*Aeschynomene falcata*)  
[Jointvetch, Villose](#) (*Aeschynomene villosa*)  
[Lablab](#) (*Lablab purpureus*)  
[Leucaena](#) (*Leucaena leucocephala*)  
[Lotononis](#) (*Lotononis bainesii*)  
[Lotus, Greater](#) (*Lotus pedunculatus*)  
[Lucerne](#) (*Medicago sativa*)  
[Maldonado](#) (*Macroptilium gracile*, previously *M. longipedunculatum*)  
[Medic, Barrel](#) (*Medicago truncatula*)  
[Medic, Common burr](#) (*Medicago polymorpha*)  
[Medic, Snail](#) (*Medicago scutellata*)  
[Phasey Bean](#) (*Macroptilium lathyroides*)  
[Peanut Pinto](#) (*Arachis pinto*)  
[Peanut, Prine](#) (*Arachis glabrata*)  
[Pigeon Pea](#) (*Cajanus cajan*)  
[Pueru](#) (*Pueraria phaseoloides*)  
[Serradella, Yellow](#) (*Ornithopus compressus*)  
[Sesbania](#) (*Sesbania sesban*)  
[Siratro](#) (*Macroptilium atropurpureum*)  
[Stylo, Caatinga](#) (*Stylosanthes seabrana*)  
[Stylo, Caribbean](#) (*Stylosanthes hamata*)  
[Stylo, Common](#) (*Stylosanthes guianensis*)  
[Stylo, Fine stem](#) (*Stylosanthes hippocampoides*)  
[Stylo, Shrubby](#) (*Stylosanthes scabra*)  
[Stylo, Townsville](#) (*Stylosanthes humilis*)  
[Vigna luteola](#) (formerly *V. marina*)  
[Vigna, Creeping](#) (*Vigna parkeri*)  
[Woolly pod vetch](#) (*Vicia villosa*)

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