

# Regenerative Agriculture

# What is it?

**Regenerative Agriculture is essentially the system of using farming principles and practices that increase and enhance soil biodiversity, enrich the soil, improve water retention and enhance the ecosystem.**

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The whole point of regenerative agriculture is to capture atmospheric carbon dioxide into the soil and the biomass above the soil surface, inverting the current state of play.

The way in which this system works is to reverse the practices that are currently employed by the world's industrial agricultural production methods.

We, as the perpetrators of this world dilemma we must re-think and re-assess how we produce food for the ever-increasing world population and protect our natural resources, number one being our soil. If we look back to production systems prior to 1940, before the development of chemical fertilisers, pesticides and fungicides, our parents worked with nature, feeding the soil flora and fauna, which in turn fed the plants which we cropped as a grain or through livestock.

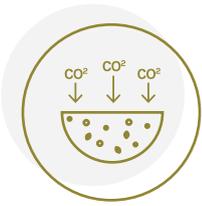
We can farm in a more environmentally friendly way by employing important practices such as decreasing the time that our precious soil is left free of cover by plant life.

The range of seeds and mixtures the Cope Seeds & Grain have to offer, fulfil every situation, not only enhancing soil biodiversity, enriching the soil, increasing the available nutrients, but also decreasing the carbon dioxide in the atmosphere.



# 5 core principles of regenerative agriculture:





## Minimising soil disturbance

**Tillage loosens and removes any plant matter covering the soil, leaving it bare. Bare soil, especially soil that is deficient in rich organic matter, is more likely to be eroded by wind and water.**

Tilling releases carbon into the atmosphere and displaces and/or kills off the millions of microbes and insects that form healthy soil biology. The long-term use of deep tillage can convert healthy soil into a lifeless growing medium dependent on chemical inputs for productivity.

No-till/minimum tillage, in conjunction with other regenerative practices, enhances soil aggregation, water infiltration and retention, and carbon sequestration.



## Building soil fertility naturally

**Soil fertility is increased in regenerative systems biologically through application of cover crops, crop rotations, compost, and animal manures, which restore the plant/soil microbiome.**

Artificial and synthetic fertilisers have created imbalances in the structure and function of microbial communities in soils, bypassing the natural biological acquisition of nutrients for the plants, creating a dependent agroecosystem and weaker, less resilient plants.

Also, artificial fertilisers are manufactured from fossil fuels, in an energy intensive way, as well being a major contributor to increased nitrous oxide emissions in agriculture.



## Enhancing biodiversity

**Soils contain enormous numbers of diverse living organisms assembled in complex and varied communities. Soil biodiversity reflects the variability among living organisms in the soil - ranging from the myriad of invisible microbes, bacteria and fungi to the more familiar macro-fauna such as earthworms and termites.**

Plant roots can also be considered as soil organisms in view of their symbiotic relationships and interactions with other soil components. These diverse organisms interact with one another and with the various plants and animals in the ecosystem, forming a complex web of biological activity.

Building biological ecosystem diversity begins with inoculation of soils with composts or compost extracts to restore soil microbial community population, structure and functionality restoring soil system energy through full-time planting of multiple crop intercrop plantings, multispecies cover crops, and borders planted for bee habitat and other beneficial insects.



## Integrating livestock

**Well-managed grazing practices stimulate improved plant growth, increased soil carbon deposits, and overall pasture and grazing land productivity while greatly increasing soil fertility, insect and plant biodiversity, and soil carbon sequestration.**

Regenerative grazing is a principle-driven agricultural practice of building soil health by managing livestock on perennial and annual forages, rather than just turning out your animals and letting them graze where they like when they like.

Regenerative grazing is managing where and for how long your animals graze to increase the cover of your grasses, the organic matter in your soil and the amount of photosynthesis per plant. The idea is to mimic nature whose grasslands evolved in a symbiotic relationship. It is not a strict formula or recipe and it relies on observation and adaptive management.



## Diverse cropping

Keeping the soil covered with diverse crops is key to regenerating them. Generally, the more plant diversity there is in a field, where the soil is kept covered with as many multiple crop and intercrop plantings, multispecies cover crops, and borders planted for bee habitat and other beneficial insects, the healthier the soil will be. Adding livestock to this rotation in a managed way, can have soil benefits through the use of organic matter and natural fertiliser.

Diverse crop rotations will add to the diversity of soil microorganisms and create soils that assure crop resilience and optimum yield over time. This practice of incorporating plant diversity diversity, which is key to soil health and regenerative agricultural practices.



## Mob grazing

Mob grazing is a practice that's being more readily employed in UK agriculture and its essentially grazing a small area intensively and moving the livestock on regularly, as much as daily, to give a long recovery period of between 40 - 100 days.

The grass height upon returning to a paddock is tall (30 to 60cm). This results in greater plant root depth, higher fibre content and increased plant diversity. If plants are small, they will have smaller roots and mob grazing encourages healthy plant growth, builds root structure and improves overall soil health, while at the same time as improving grassland productivity.

Mob grazing can give overall benefits to soil fertility, water retention, biodiversity and animal health.



## Herbal ley grazing

The deep-rooting nature of herbal leys increases drought resistance. The combination of the diverse growth habits of species can help improve soil structure, increase organic matter and improve microbacterial activity.

Diverse herbal ley mixtures produce a sward ideal for grazing or cutting, but the additional benefits to soil structure, nitrogen fixation and mineral and protein content are well documented. Many of the herbs have strong root systems and can help to store carbon as well as naturally helping to break up soil compaction.



# Regenerative farming mixtures

## Post Maize

6.25 kg	Westerwolds Ryegrass
6.25 kg	Tetraploid Italian Ryegrass

12.50 kilos per acre

— ABOUT

This blend of Italian Ryegrass and Westerwold Ryegrass sown immediately after harvesting a maize crop, establishes extremely fast, which will create excellent ground cover. This not only reduces erosion and loss of valuable nutrients through the winter months, but will provide early grazing, zero grazing or silage cuts. Sown in spring, after winter damage, it will show rapid growth and high yields.

## 2-3 Year (No Clover)

2.50 kg	SHAKIRA, Diploid Italian Ryegrass
2.50 kg	TEANNA, Tetraploid Italian Ryegrass
4.00 kg	LOFA, Festulolium
4.00 kg	ASTON CRUSADER, Tetraploid Hybrid Ryegrass

13.0 kilos per

— ABOUT

This is a blend of Diploid and Tetraploid Italian Ryegrasses with the inclusion of a Festulolium. It is suitable for a range of short-term uses, perfect for sowing in late autumn, it will produce a bumper crop in early spring for early grazing or for silage, prior to establishing another maize crop. Alternatively, it can be left for further cropping during the summer and autumn.

## 2-3 Year (Red Clover)

2.25 kg	SHAKIRA, Diploid Italian Ryegrass
2.50 kg	TEANNA, Tetraploid Italian Ryegrass
2.50 kg	LOFA, Festulolium
2.75 kg	ASTON ENERGY, Tetraploid Hybrid Ryegrass
2.50 kg	ROZETA, Red Clover

12.50 kilos per acre

— ABOUT

A grass mixture formulated to provide large cuts of protein rich hay or silage. It can also be grazed if required and is ideal for lamb fattening. When ploughed up, the red clover will leave good quantities of residual nitrogen in the soil for the following crop.

# Regenerative farming mixtures

## Sweet Grass

2.00 kg	NIFTY, Diploid Intermediate Perennial Ryegrass
2.75 kg	TODDINGTON, Diploid Late Perennial Ryegrass
3.00 kg	OAKPARK, Diploid Late Perennial Ryegrass
2.00 kg	CANCAN, Diploid Late Perennial Ryegrass
2.00 kg	NASHOTA, Tetraploid Late Perennial Ryegrass
0.30 kg	BARBLANCA, Large Leafed White Clover
0.50 kg	BUDDY, Medium Leafed White Clover
0.45 kg	RIVENDEL, Small Leafed White Clover

13.00 kilos per acre

### — ABOUT

This mixture has been designed to produce high sugar forage. All the varieties have been selected for their digestability and grazing yield, as well as their growth and productivity throughout the grazing season. The inclusion of highly digestible deeper rooted tetraploid, have been shown to be more tolerant of drier conditions. The selected varieties all exhibit good disease resistance.

## Inter Row Herbal Ley

1.25 kg	AMBA, Cocksfoot	0.60 kg	GEA, Lucerne
1.50 kg	OAKPARK, Diploid Late Perennial Ryegrass	0.50 kg	RIVENDEL, Small Leafed White Clover
1.75 kg	DOLINA, Timothy	1.80 kg	Sainfoin
1.25 kg	LAURA, Meadow Fescue	0.50 kg	Birdsfoot Trefoil
1.00 kg	PERUN, Festulolium	0.25 kg	SPADONA, Chicory
0.50 kg	AURORA, Alsike Clover	0.60 kg	Burnet
0.60 kg	ROZETA, Red Clover	0.10 kg	Yarrow
0.40 kg	Yellow Sweet Clover	0.35 kg	Sheeps Parsley
		0.15 kg	RANGER, Ribwort Plantain

13.00 kilos per acre

### — ABOUT

A diverse mixture of grasses, clovers and herbs, formulated to produce a sward ideal for interrow seeding. The diverse species have been selected specifically to not over grow higher than the main crop. This will not only provide quality forage but also with the deep rooting herbs, help to improve soil structure and draw up essential vitamins and minerals for ruminant animals, providing after harvest grazing for livestock.

# Regenerative farming mixtures

## Herbal Ley

<b>2.25 kg</b>	ASTON CRUSADER, Tetraploid Hybrid Ryegrass	<b>0.20 kg</b>	Birdsfoot Trefoil
<b>2.50 kg</b>	NIFTY, Diploid Intermed Intermediate Perennial Ryegrass	<b>0.50 kg</b>	GEA, Lucerne
<b>1.50 kg</b>	LAURA, Meadow Fescue	<b>0.70 kg</b>	Yellow Sweet Clover
<b>2.00 kg</b>	DOLINA, Timothy	<b>0.50 kg</b>	SWORD/SPADONA, Chicory
<b>0.75 kg</b>	NIVA, Cocksfoot	<b>0.15 kg</b>	RANGER, Ribwort Plantain
<b>0.95 kg</b>	ROZETA, Broad Red Clover	<b>0.45 kg</b>	Burnet
<b>0.50 kg</b>	BARBLANCA, Large Leafed White Clover	<b>0.10 kg</b>	Sheeps Parsley
<b>0.45 kg</b>	AURORA, Alsike Clover		

13.50 kilos per acre

### — ABOUT

A diverse mixture of grasses, clovers and herbs, formulated to produce a sward ideal for grazing or cutting. This will not only provide quality forage but also with the deep rooting herbs help to improve soil structure and draw up essential vitamins and minerals for ruminant animals.

## Living Mulch White Clover Blend

<b>2.00 kg</b>	RIVENDEL, Small Leafed White Clover
<b>2.00 kg</b>	GRASSLANDS HUIA, Medium Small Leafed White Clover

4.00 kilos per acre

### — ABOUT

This mixture of Leguminous clovers will cover and enhance the following season's planting area it will minimise open space problems, and will provide valuable nitrogen and organic matter into the soil.

# Cover crop and green manure species options

Cover crops and green manures are important for building and maintaining soil fertility and structure, they can help with weed control and can be grazed. They're normally incorporated back into the soil, either directly, or after removal and composting.





## Forage Rye

Sown at 60kg/ha

Excellent weed suppression and high biomass. Lifts and holds N & K. Increases organic matter in the soil. Often sown in conjunction with Vetch. Rapid establishment, so it can be sown later.

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## Italian Ryegrass

Sown at 40kg/ha

Excellent biomass production above and below ground level. IRG is quick to establish with good weed suppressing attributes. It has long-term soil improvement characteristics which can be grazed or conserved.

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## Black Oats

Sow at 40kg/ha

Very quick to establish with good weed suppression and is also disease suppressing. N & K lift and hold. Increases organic matter.

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## Brown Mustard

Sow at 5kg/ha

Very strong and early vigour for weed suppression. Produces isothiocyanate for biofumigant effect. Some frost tolerance. Increases organic matter and traps N & K. Can be used for grazing. Can be later sown than other crops.

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## Oil Radish

Sow at 12kg/ha

Deep rooted for soil conditioning with good weed suppression. Has high biomass so increases soil organic matter. Has a biofumigant effect with some nematode control. Most Oil Radish are club root resistant.

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## Tillage radish

Sown at 12kh/ha

Long tap root for deeper soil conditioning, also traps N & K. Has biofumigant effect. Significant control of beet cyst eelworm and other nematodes.



## Buckwheat

Sow at 50kg/ha

Raises N & P. Very quick growing with a large biomass. Not frost tolerant.



## Vetch

Sow at 40kh/ha

Excellent nitrogen fixer particularly when sown early, compatible with oats and rye (often sown together).



## Egyptian Clover

Sow at 12kh/ha

An annual legume for nitrogen fixing. Establishes quickly but has variable frost tolerance.



## Crimson Clover

Sow at 12kh/ha

Grows at lower temperatures than most other annual legumes. Quick establishment with an upright growth habit. Good weed suppression. Degrades into the soil very quickly.



### Red Clover

Sow at 12kg/ha

Sow at 20kg/ha

Has historically has been used as a nutrient builder. A good nitrogen fixer but must be drilled early to get established. A winter hardy perennial.

Lucerne can be slow to establish. Excellent nitrogen fixer. Must be sown early.



### Red Vetch

Sow at 40kg/ha

A quick growing high biomass producer.



### Linseed

Sow at 30kg/ha

Easy to establish and is a good nitrogen fixer. A branch tap root aids soil conditioning. It is not as attractive to slugs as other crops.



### Phacelia

Sow at 6kg/ha

Excellent disease break crop/insect attractant (hover flies eat aphids). Breaks down quickly to release C,P,K and Mg.



### Kale/mustard hybrid

Sow at 5kg/ha

Very quick establishment giving excellent weed suppression. Traps N,P and K and is frost tolerant. Provides excellent game bird cover over winter.



## White mustard

Sow at 5kg/ha

Excellent source of biomass and thus increases the organic matter, provides superior weed suppression, traps N & P in the growing crop. Has a biocidal effect against weeds and pests. Has some effects against nematodes.

# Cover crop mixtures

## BOOSTER

A non brassicae mix providing rapid cover, nitrogen and soil organic matter enhancement.

- Vetch
- Phacelia
- Berseem Clover
- Black Oats
- Persian Clover

Sowing Rate: 12.00kg/acre

## DECOY

Rapid cover provided with nematode multi resistant components, plus impressive soil structure improvement. Option now with Brown Mustard.

- Oil Raddish
- Mustard
- Phacelia
- Berseem Clover

Sowing Rate: 8.00kg/acre

## MARVEL

An economically priced multi species, non brassicae mix. Ticks the boxes in terms of achieving greening objectives.

- Vetch
- Crimson Clover
- Persian Clover
- Black Oats
- Phacelia

Sowing Rate: 12.00kg/acre

## FLYER

A lost cost brassicae mix, giving extremely quick growth and ground cover. Superb root development helps to maximise bio mass in the short term. Excellent results in terms of a sizeable DM contribution with potential livestock utilisation. Great for drying out heavy/wetter soil types.

- Contains 4kg/pack
- Interval (Kale & Rape)
- Mustard
- Stubble Turnip
- Green Globe

Sowing Rate: 4.00kg/acre

## COMPANION

A specialist blackgrass control mixture for sowing into Winter Rape. Traps ley nutrients (Inc nitrogen), improves soil porosity and friability. Evidence of reduced slug and fleabeetle activity by using this mixture type, plus reduction of grass weed populations.

- Vetch Berseem Clover

Sowing Rate: Sow into OSR at min 6.00kg/acre

## FALLOWER

Sow into autumn stubbles prior to planned spring cropping. Combines both exceptional growth with excellent extra overall biomass contributions. Helps improve soil structure, particularly on heavier soils. Critically this mixture encourages grass weed (inc blackgrass) to establish in autumn within the sown cover crop. They can then be subsequently destroyed prior to spring sowing. Helps exhaust weed seed bank. Leaves valuable soil N contribution. Soil fertility and organic matter improvement.

- Vetch
- Blackoat

Sowing rate: 10.00kg/acre



**Cope Seeds & Grain Ltd**  
The Seed House, Pride  
Parkway, Sleaford,  
Lincolnshire, NG34 8GL

☎ +44 (0) 1529 421081  
✉ [info@copeseeds.co.uk](mailto:info@copeseeds.co.uk)  
🖱 [www.copeseeds.co.uk](http://www.copeseeds.co.uk)  
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