Regenerative Farming

Maximising crop diversity

Practical Guide

Regenerative Agriculture is a set of farm management principles which put soil health at the centre of agriculture practise. Putting soil health at the centre of farming practices has many benefits including ecosystem service such as water filtration, nutrient cycling and increased biodiversity.

The concept of regenerative agriculture often involves reduced inputs and increased management to tailor inputs and operations to the soil's requirement.

This Practical Guide looks at the third principle of regenerative farming: Maximising crop diversity

In a natural ecosystem , it is very uncommon to see a monoculture (when a single crop is sown in a field rather than multiple crop species). Modern agricultural practices rely on monocultures as they are simple to manage.

However, above ground diversity of crops leads to below ground diversity, as different species of plants associate with different soil organisms, providing the food for the natural soil food web. Different organisms are responsible for different nutrient cycles and the soil food web functions at its best when as many of those relationships are present as possible.

Crop diversity can be increased in various ways. The diversity of the actual cash crops can be increased in many rotations, companion cropping or intercropping can provide the diversity within an arable crop and the use of diverse green cover crops can provide increased diversity between cash crops.

The farmers within the Soil Regenerative Farming Group have experimented with the following crops in rotation—wheat, barley, oats, rye, oilseed rape, lupins, peas, beans, linseed, hemp, grass, potatoes.

Companion cropping is when a range of crop species are planted along side the planned cash crop. Intercropping is when two cash crops are grown simultaneously. Companion crops should:

- Deliver something useful such as increased nitrogen or phosphate, weed suppression and pest reduction
- Should complement both the root growth and top growth of the main crop, rather than out-competing the cash crop
- Should be a species which can be either controlled in crop or easily separated at harvest
- Should be able to germinate under similar drilling conditions

Example companion crops are clover, vetch and peas.

Farming for a Better Climate

Five Principles of Regenerative Agriculture:

1. Maintaining a living root
2. Minimising soil disturbance
3. **Maximising crop diversity**
4. Keeping soil covered
5. Integrating livestock

For more Practical Guides, Case Studies, information and to see what other farmers have done, visit www.farmingforabetterclimate.org

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Websites

www.farmingforabetterclimate.org

See also:

Soil Regenerative Agriculture Group

www.farmingfutures.org.uk

Home | Scotland's soils

(environment.gov.scot)

Scottish Government
Riaghaltas na h-Alba
gov.scot

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Green cover cropping

Green cover crops are crops which are sown in between the cash crops to ensure a living root is maintained in the soil, helps reduce erosion and keep soil covered and can either be incorporated, left in situ with follow cash crop direct drilled into it or grazed of with livestock.

A much more diverse range of plants can be grown in a green cover crop as no market needs to be found.

Further information and examples of crops used in green cover mixes can be found in Practical Guide 4—Keeping Soil Covered.

Benefits and drawbacks of companion/intercropping:

Benefits:

- Higher crop productivity
- More efficient resource use
- Weed, pest and disease suppression
- Attracts beneficial organisms
- Improves soil quality
- Helps resilience to stress
- Lower input costs (fertiliser, pesticides)
- Can lower use of bagged fertiliser
- Enhanced ecosystem services

Drawbacks:

- Crops can compete against each other for light, water and nutrients
- Limitations of sprays available such as herbicides
- Can reduce yields if crops differ in their competitive ability
- Harvest can be challenging depending on the crop grown

Selecting the right crop species to sow together is crucial to the success of the crops. If one crop is more competitive than the other then it will out compete it for light, water and nutrients. This will cause one of the crops to fail.

Growing legumes along with another crop can help to reduce the amount of artificial fertiliser required, as the legumes fix their own nitrogen and then provides the nitrogen for the cereal crop once the legume crop is terminated.

Cover cropping is one of the topics the Soil Regenerative Agriculture Group have explored in more detail as part of their work with Farming for a Better Climate. Take a look at the groups findings at [Soil Regenerative Agriculture Group - Farming for a Better Climate]

Key Points

- Species selection is key to success
- Speak to your advisor about species selection
- Increases soil biodiversity
- Higher crop productivity
- Cover crops and green cropping can help to lower input costs