

Hay Days: management of floodplain meadows for sustainable hay production

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Floodplain meadows

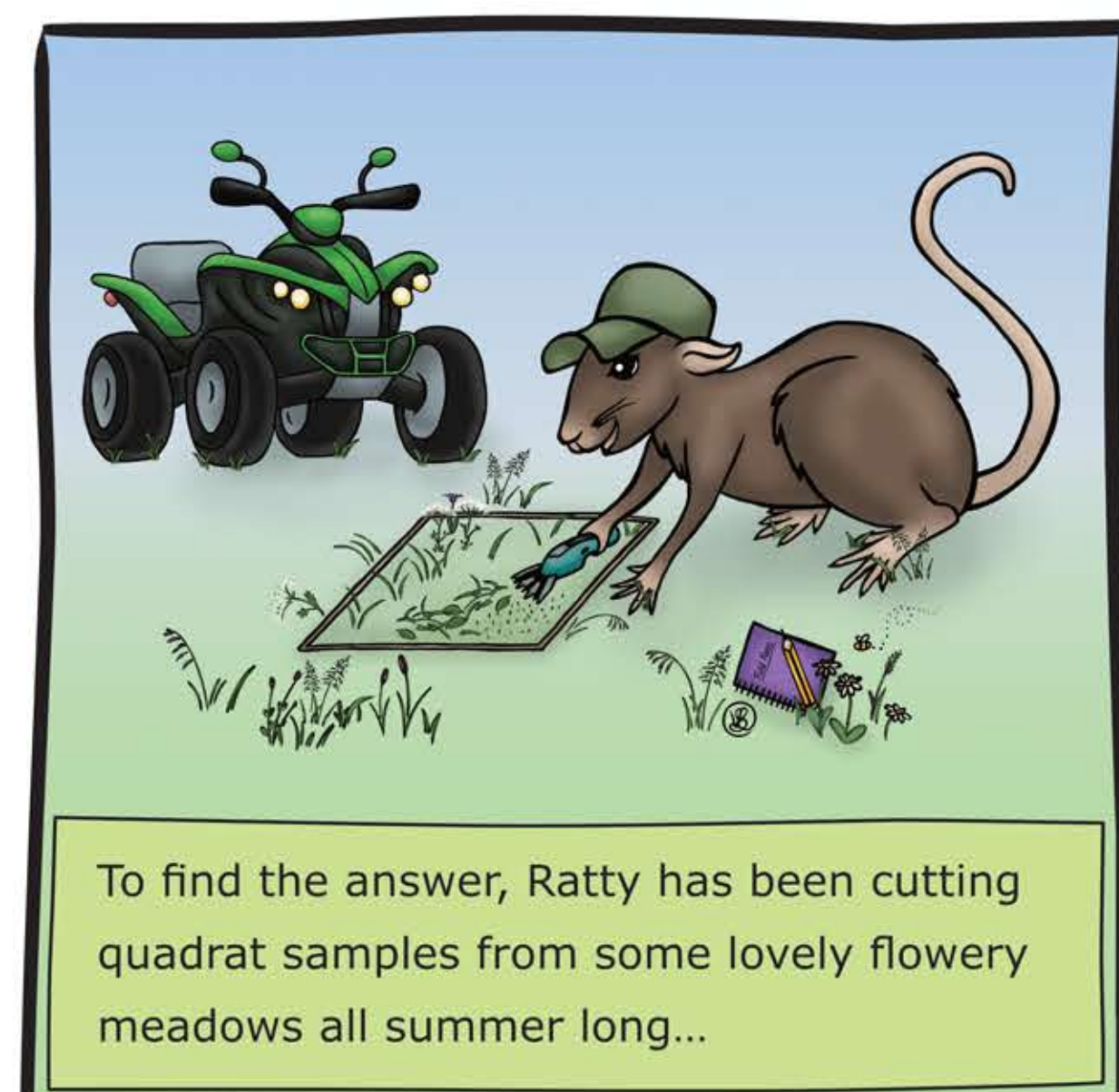
These internationally threatened meadows depend on annual hay cutting and aftermath grazing to maintain their characteristic botanical diversity. Changes in agricultural methods and land use over the last century have led to the loss of 97% of our heritage wildflower meadows. This study investigates how agricultural production can be brought back into balance with biodiversity conservation through well-timed haymaking.



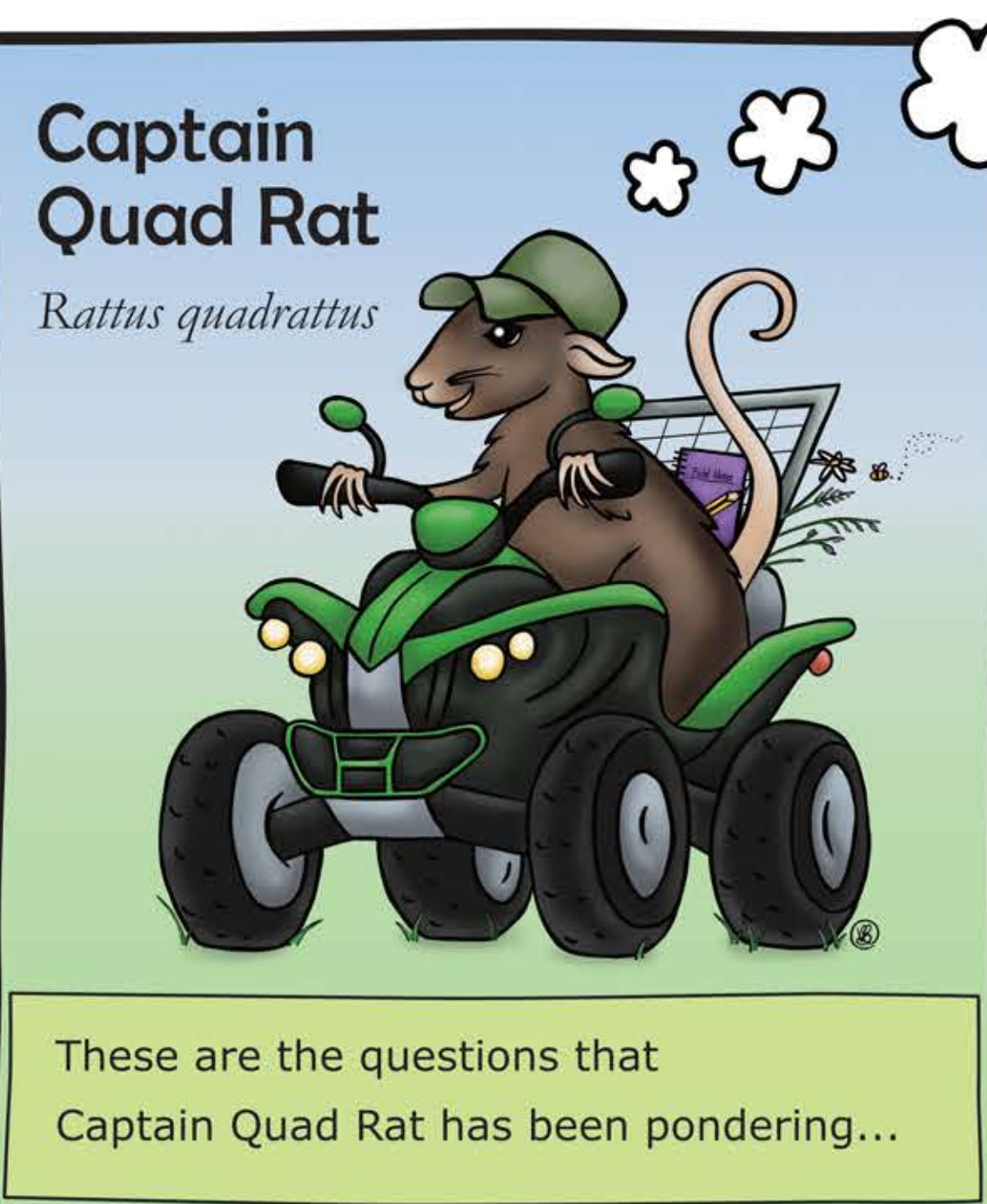
Hay Days



Is it best to cut meadow hay in mid-summer, when it is most nutritious?
Or leave it for the insects and other wildlife to enjoy until the end of summer?



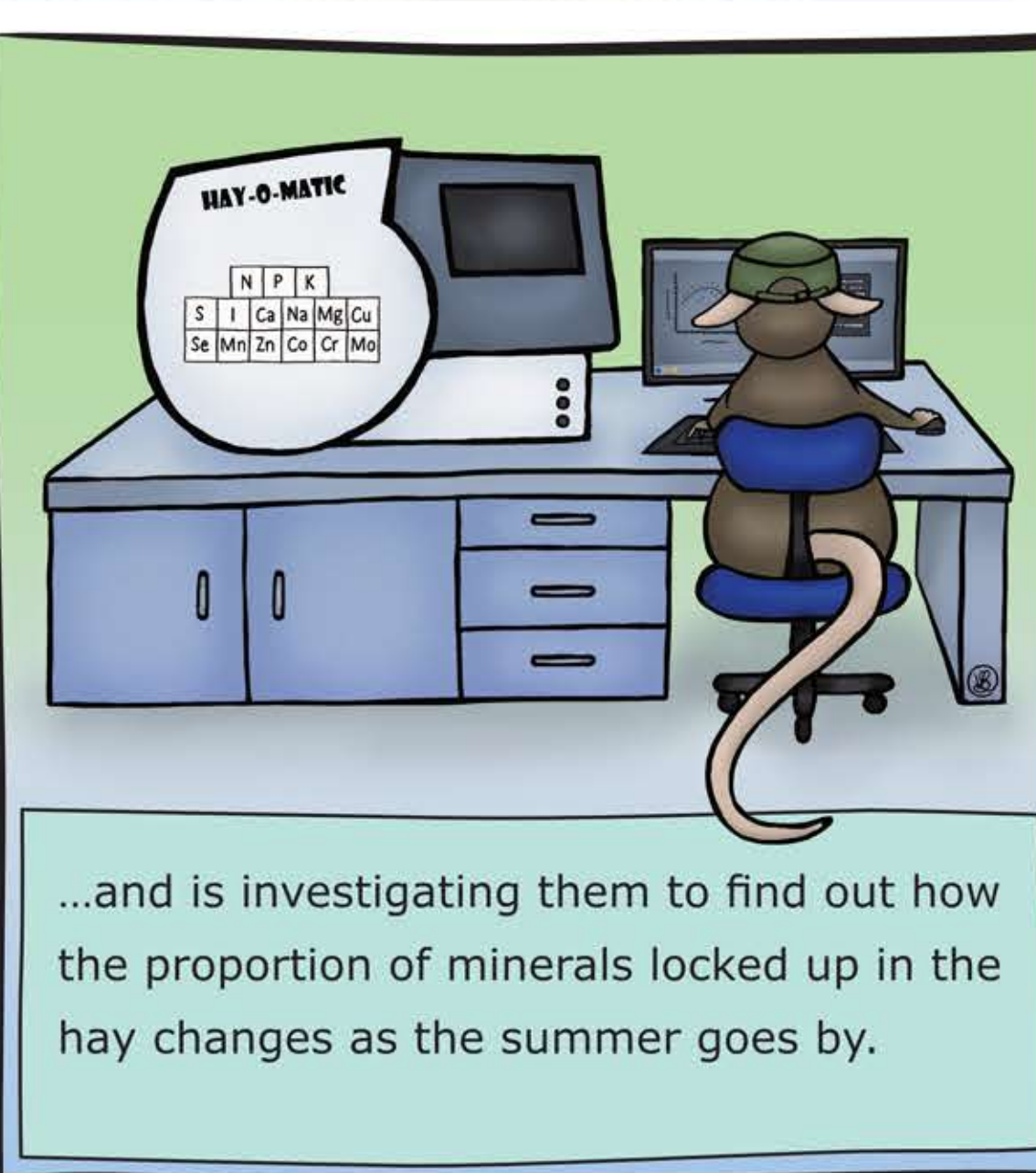
To find the answer, Ratty has been cutting quadrat samples from some lovely flowery meadows all summer long...



Captain Quad Rat

Rattus quadratus

These are the questions that Captain Quad Rat has been pondering...



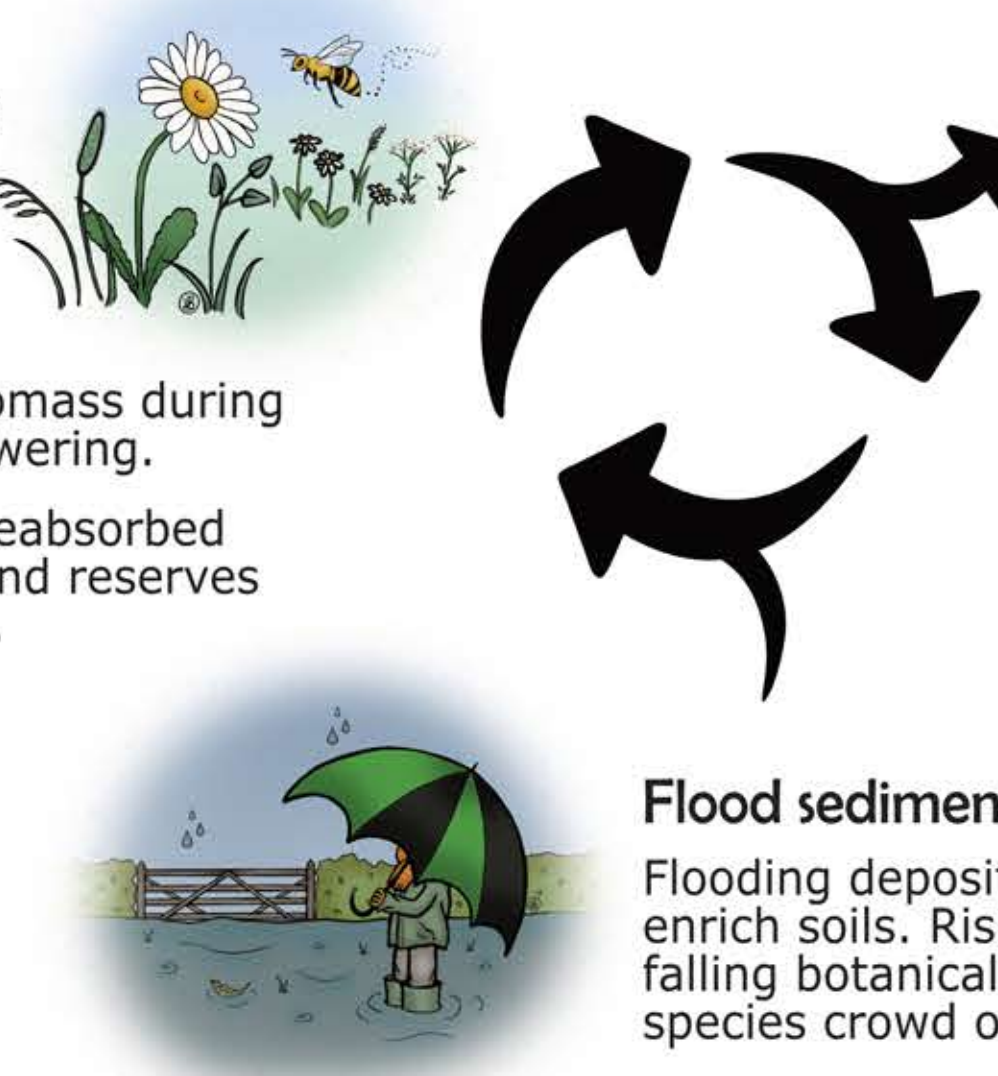
...and is investigating them to find out how the proportion of minerals locked up in the hay changes as the summer goes by.

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The floodplain meadow nutrient pump

Plant growth: nutrients transferred

Plant growth transfers soil nutrients to biomass during growth and flowering. Nutrients are reabsorbed into underground reserves after flowering.



Haymaking: nutrients removed

Haymaking before flowering finishes removes soil nutrients, preventing them from building up in the soil and ensuring a wide range of plant species can thrive.



Flood sediments: nutrients deposited

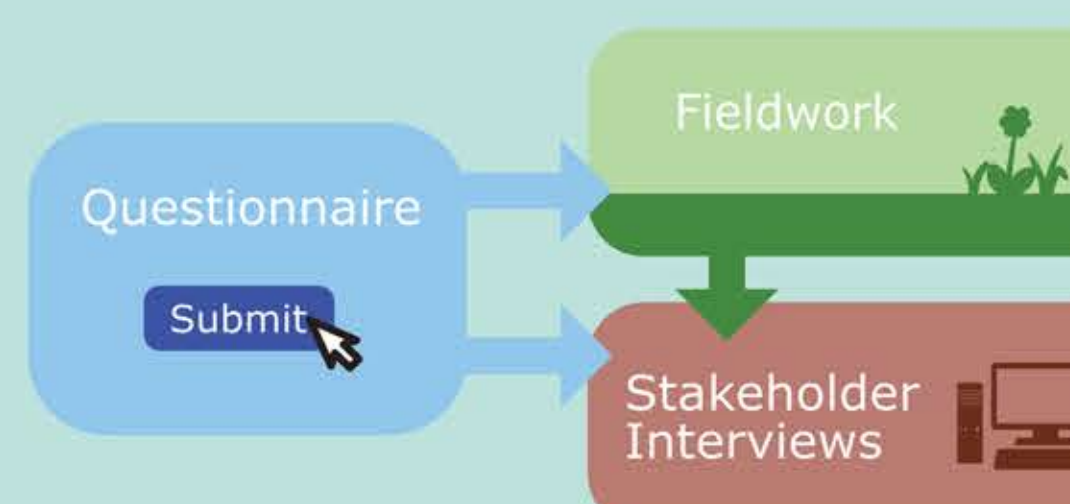
Flooding deposits nutrient-rich sediments that enrich soils. Rising soil nutrients can lead to falling botanical diversity as tall competitive species crowd out lower growing plants.



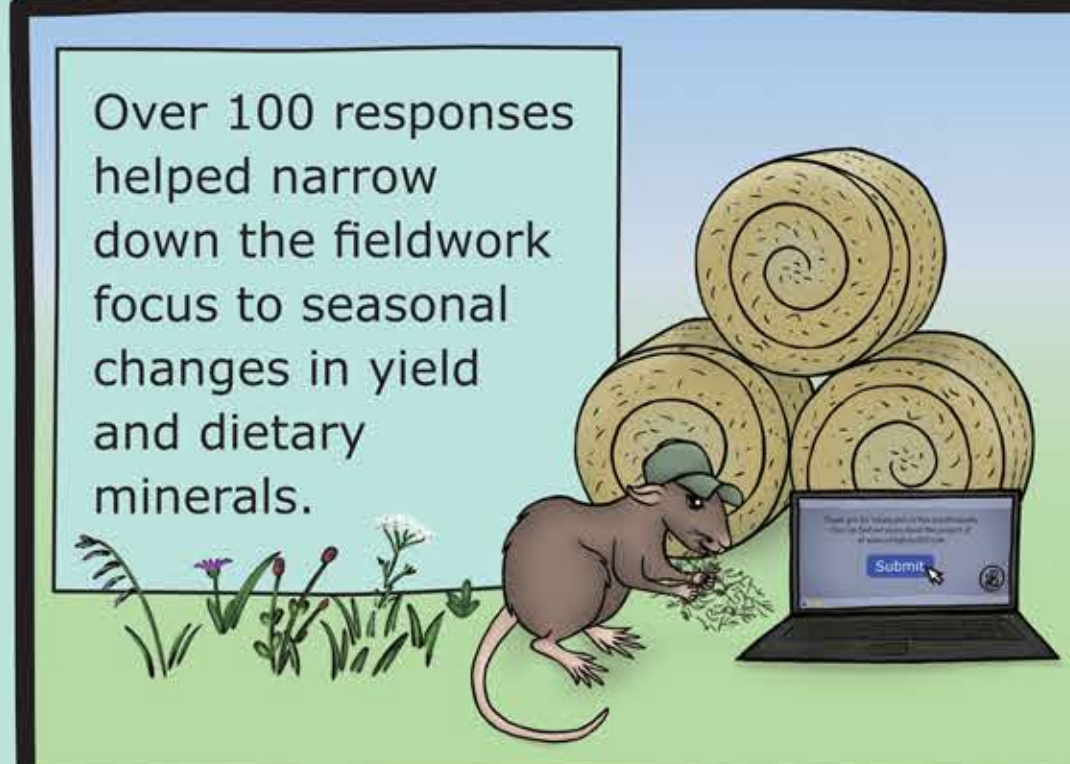
Understanding this can help farmers use the timing of their annual hay cut to balance the production of a nutritious hay crop with biodiversity conservation.

Meadow Managers

Meadows would not be meadows without meadow managers. So this project began by seeking their views to inform the fieldwork focus.



The questionnaire



Over 100 responses helped narrow down the fieldwork focus to seasonal changes in yield and dietary minerals.

The interviews



A series of land manager interviews during 2021 is exploring the practical implications of this research for their daily decisions.

Nature Friendly Farming

Conservation and farming are often portrayed as opposing forces in the media and it became clear from the questionnaire that this divide is inaccurate and unhelpful.



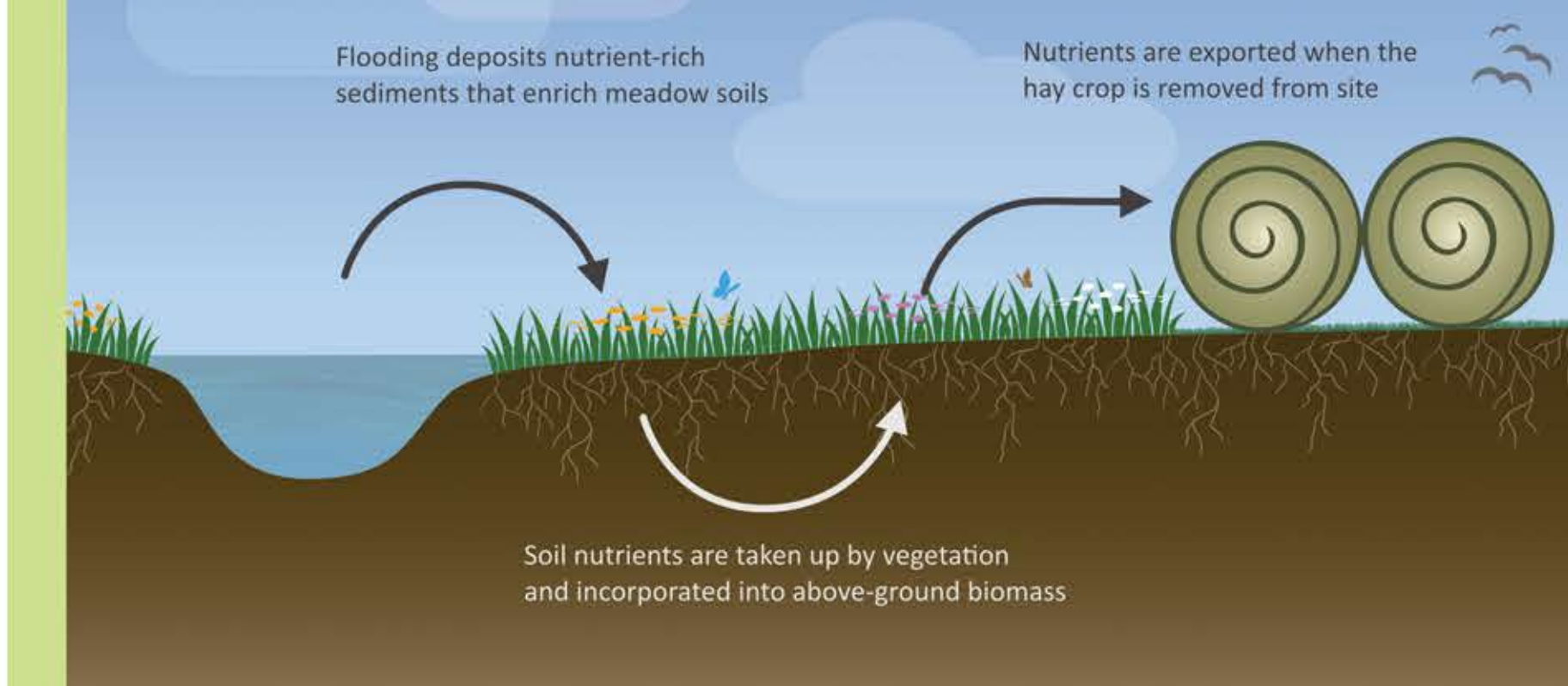
"Keen conservation focus within livestock production here - they're not mutually exclusive!"

Hay yield and minerals

Floodplain meadows are a naturally fertile farm resource.

How hay makes meadows

Rising soil nutrients leads to declining botanical diversity as tall competitive species take over and crowd out lower growing plants. So it is important to balance nutrient inputs from sediments by removing them in an annual hay crop.

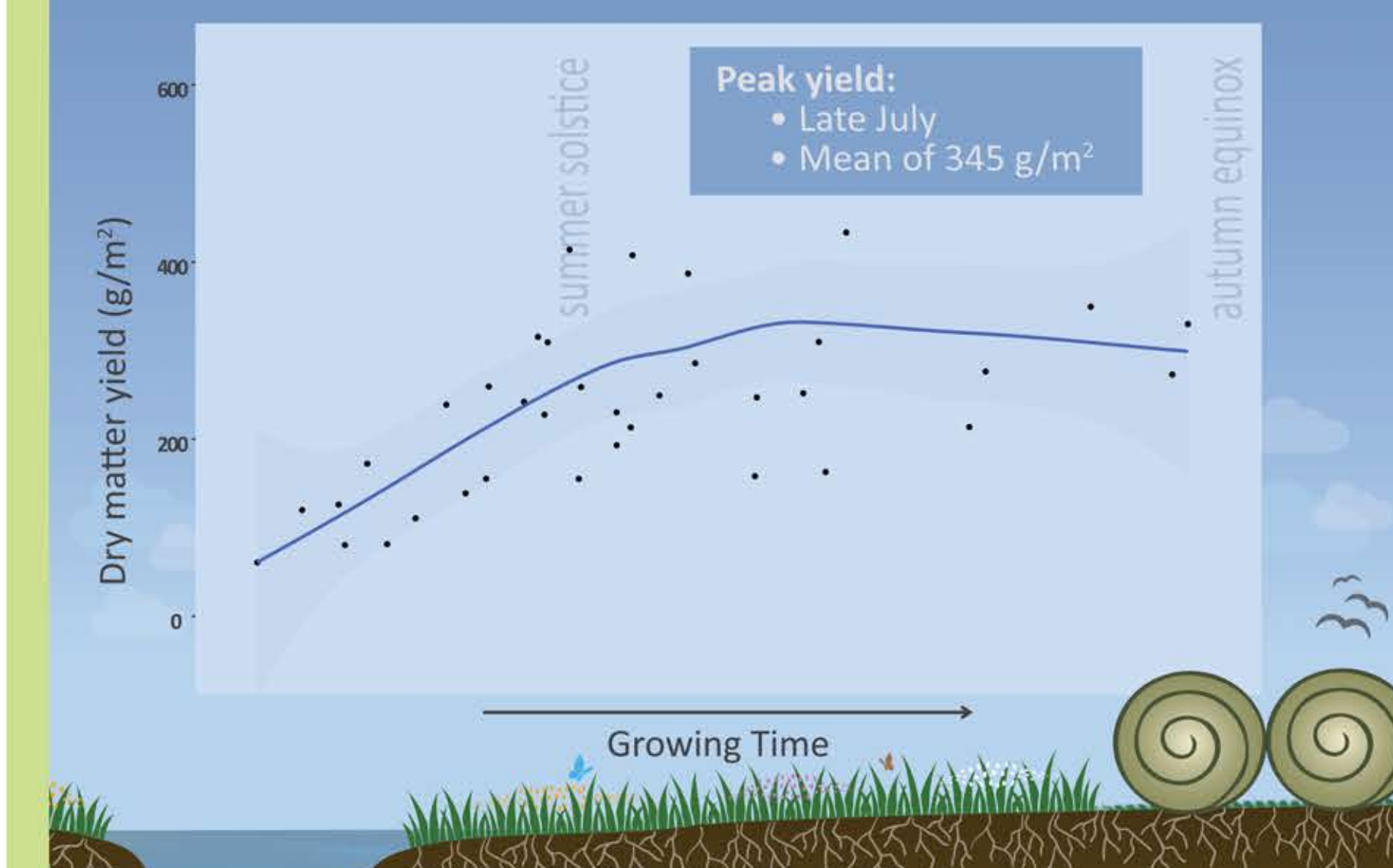


Cutting date

Peak yield and peak nutrient content do not occur at the same time, so land managers need to find the right balance. Mineral data for this study is currently being analysed.

Agri-environment schemes often restrict hay cutting dates until after mid-July and this can cause conflict between agricultural and biodiversity management goals.

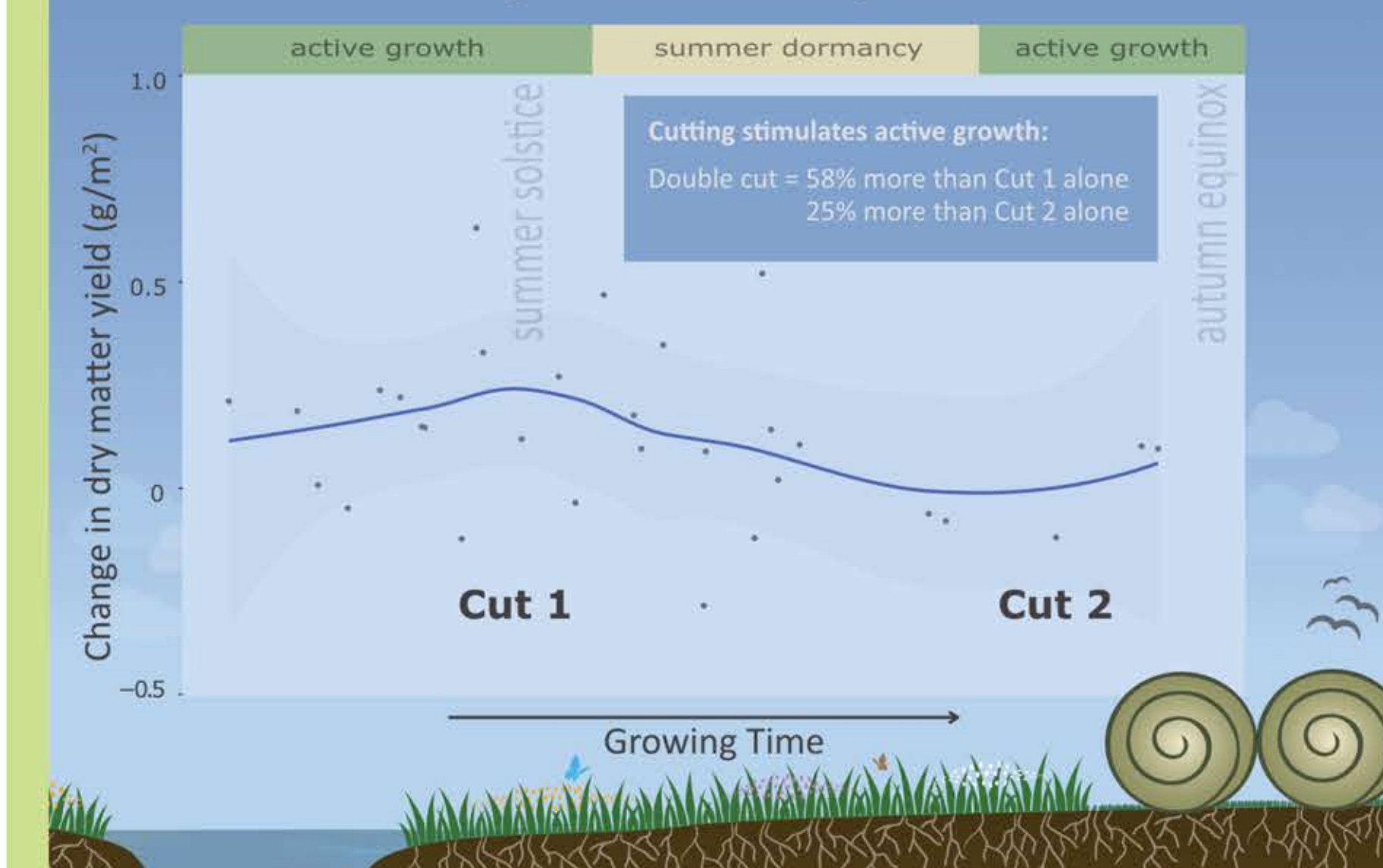
Dry matter yield on floodplain meadows



Double cutting

One method to maximise yield and total nutrient removal is to take a double hay cut. The aim is to take two harvests during the active growth periods in the early summer and autumn, avoiding the summer dormant period.

Growth and yield on floodplain meadows



Acknowledgements and References

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All illustrations, infographics and photographs on this poster are original work ©Vicky Bowskill. This study runs from 2019 to 2023 with thanks my supervisors, the Floodplain Meadows Partnership, the Open University School of Environment, Earth and Ecosystem Sciences, funder CENTA and study site owners BBOWT, FAI Farms Ltd and The Parks Trust.

