How grasslands work

enhancing and managing them for horses

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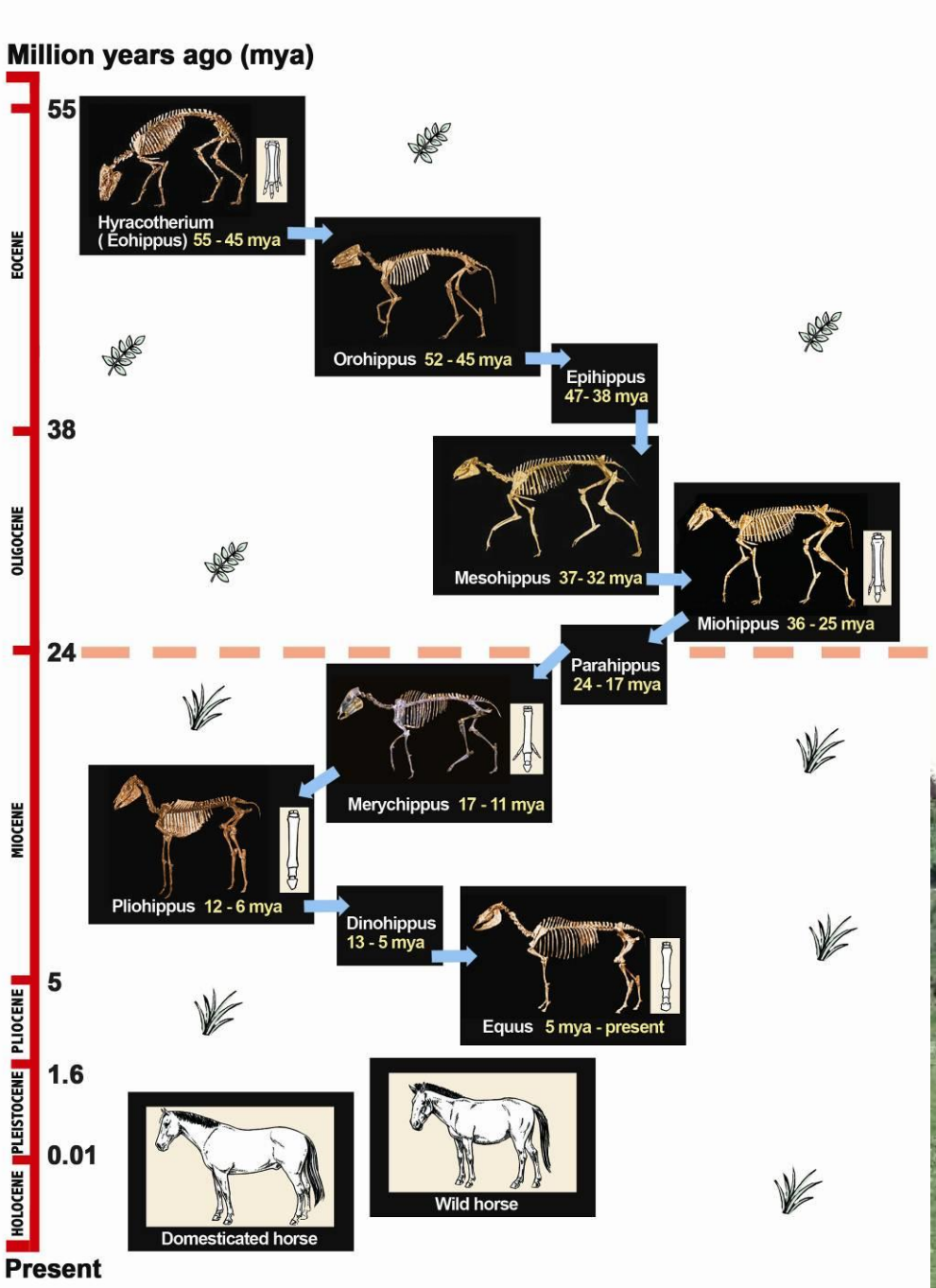
The starting point


Million years ago (mya)
55
38
24
5
1.6
0.01
Present
EOCENE
OLIGOCENE
MIOCENE
PLIOCENE
PLEISTOCENE
HOLOCENE
Hyracotherium
(Eohippus) 55 - 45 mya
Orohippus 52 - 45 mya
Epihippus
47- 38 mya
Mesohippus 37- 32 mya
Miohippus 36 - 25 mya
Parahippus
24 - 17 mya
Merychippus 17 - 11 mya
Pliohippus 12 - 6 mya
Dinohippus
13 - 5 mya
Equus 5 mya - present
Wild horse
Domesticated horse

What horses want

- Large areas of high-fibre, low sugar vegetation to roam across
- Near constant ability to graze
- Companionship of their own kind
- Space to run and play
- Shelter
- It is natural for them to get thinner in winter and plumper in summer

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What horse owners want

- Horses to be athletes all year round, not plump in summer, not eating all the time
- Readily available, so small fields near buildings
- Horses should be able to get their own exercise - safety
- Protected from other horses (with iron shoes)

What wildlife wants

- Dung and animals attract insects
- Animal food and water attracts other wildlife, including birds
- Diverse vegetation – both structure and plant species, including patches of bare ground
- Wildflowers need conditions of low fertility
- Trees, hedges, open buildings

The compromise: horses in paddocks

- Freedom from hunger and thirst: Constant supply of low protein, low carbohydrate, high fibre food (50-100% of diet should be high fibre forage) plus water
- Freedom from discomfort: Shelter and suitable resting area free of mud
- Freedom from pain, injury disease: Safety – good boundaries, suitable forage
- Freedom to express normal behaviour: Sufficient space for daily exercise, herd behaviour
- Freedom from fear and distress: Avoid boredom, loneliness

Behaviour at grass

- Will graze for 16 or more hours daily
- Can graze extremely short
- Graze selectively
- Create latrine areas
- Create paths and bare patches
- Congregate in shade, near water and gates

Grasses

- 10,000+ species worldwide, 160+ growing in Britain
- World's most successful plants? (includes cereals, rice, sugar cane)
- Adapted to all conditions of soil, climate, altitude etc.
- Withstand grazing!
- Naturally grow in association with each other and other plant species

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Grass and grassland

- Grass is a flowering plant which spreads both by seed and by roots and shoots (vegetatively)
- It is encouraged to spread by grazing and cutting
- Grassland contains a range of grasses, flowers and lower plants – the wider the diversity, the more dietary requirements are met
- Fertiliser use and other management can reduce the number of species in grassland
- In UK, if grassland is not grazed, cut or burned, it will turn to scrub and eventually to woodland

What grows where?

- Climate
- Soil
  - geology and topography
  - texture
  - alkalinity
  - condition
- Management

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Modern agricultural management

- Much research and advice is based on the needs of sheep and cattle
- The aim is to produce as much high-nutrient grass as possible on a given area
- Ryegrass is the favoured agricultural grass, and ryegrass only or ryegrass/clover mixes are recommended for sheep/cattle
- Inorganic nitrogen fertilizer is an essential part of the agricultural system
- Management may rely on ploughing up and re-seeding grass every 3-8 years

Why agricultural management doesn't suit horses

- Horses are athletes; grazing is not intended for production of meat or milk

- Need year-round exercise & grazing; tough, durable grasses, not fast-growing varieties

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Some common problems

1. Seasonal growth: too much and too little
2. Roughs and lawns: managing latrines
3. Winter wet, summer dry: bare ground
4. Weeds: thistles, docks, nettles, ragwort






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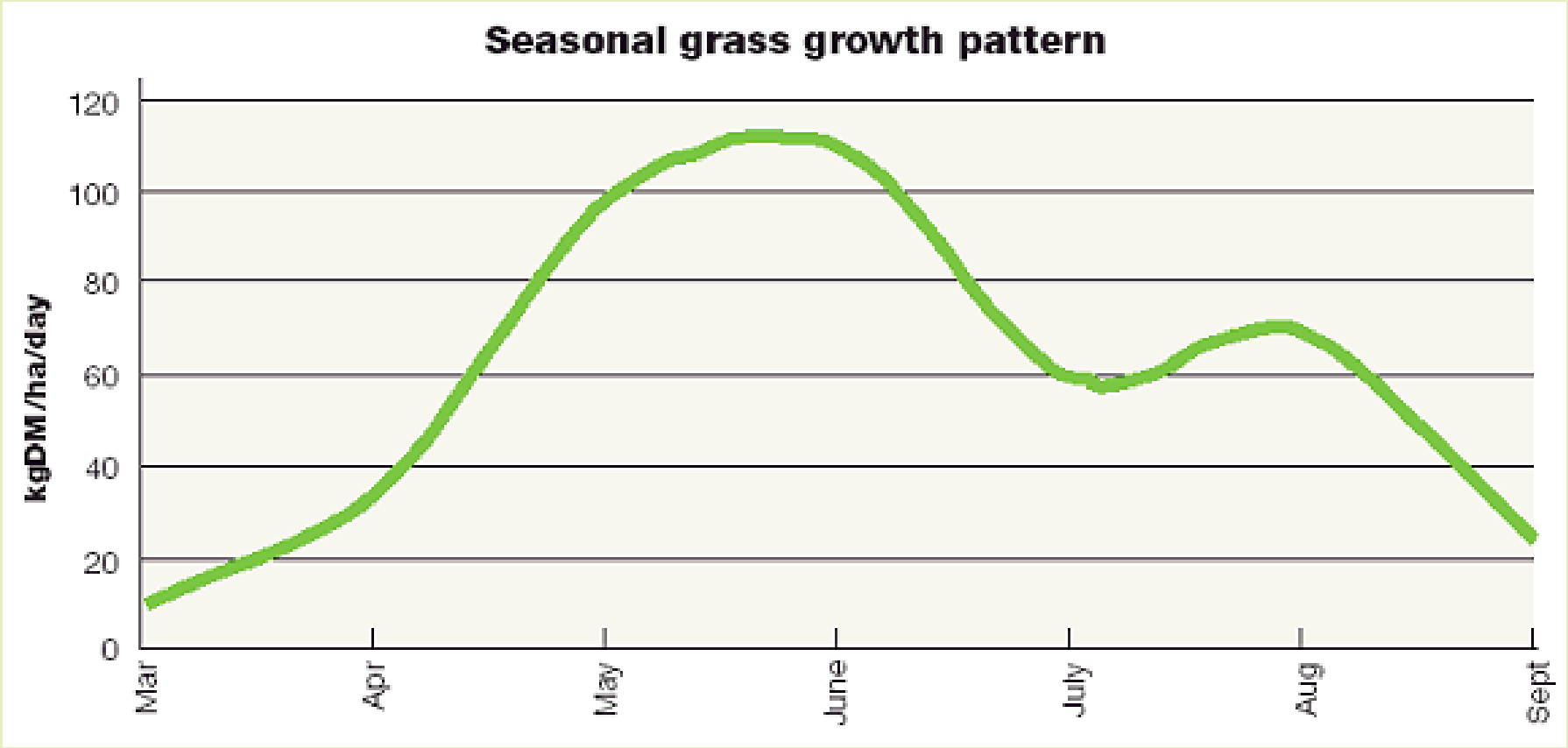
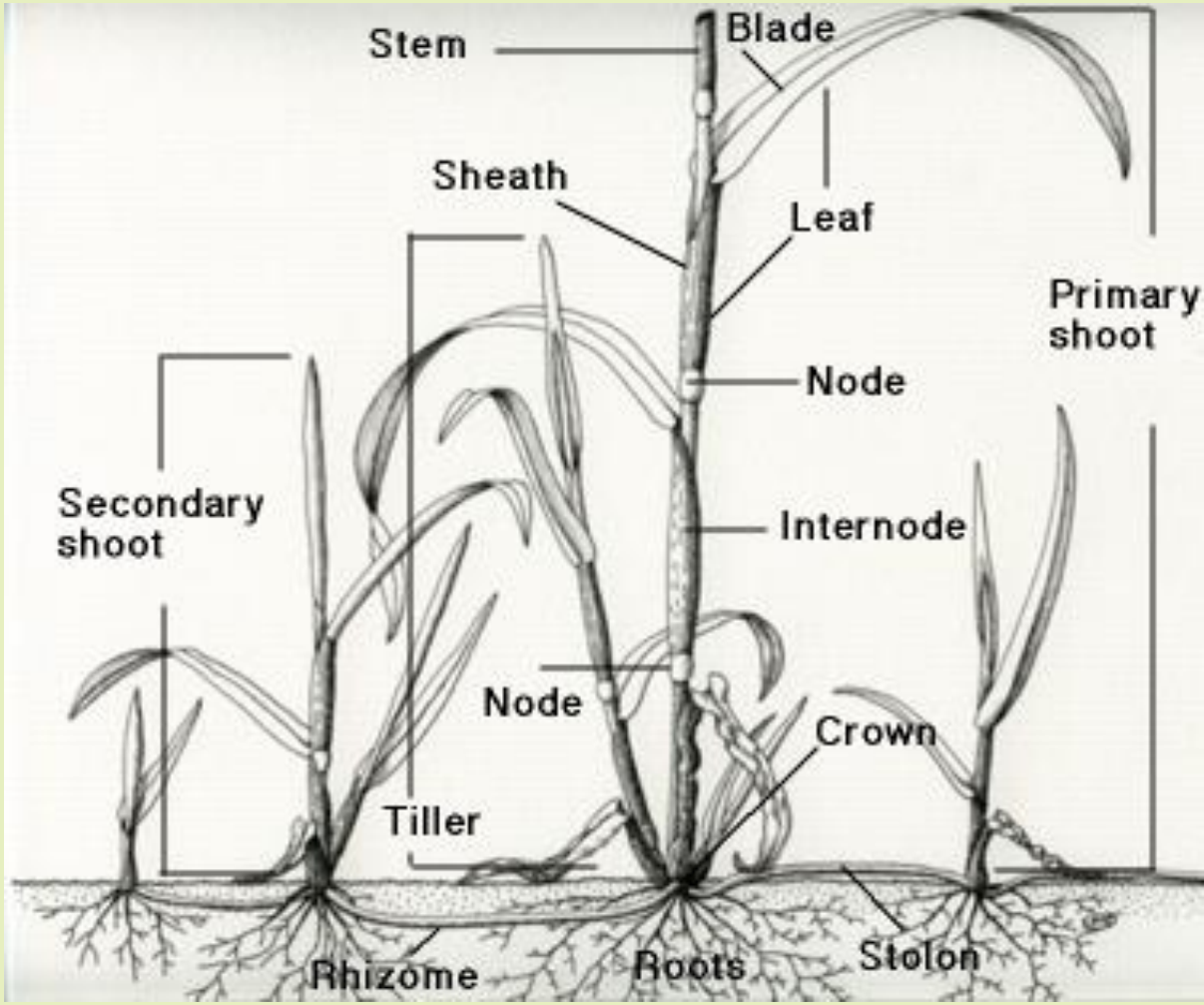
1. Seasonal growth



Too much or too little

- Will graze for 16 or more hours daily, can graze extremely short

- Overgrazing
  - weakens grasses and grazed plants
  - allows unpalatable plants to dominate
  - creates bare patches for seeding



Avoiding overgrazing

- Allow sufficient land per horse, depending on soil type, climate, time spent grazing, type of horse, land use (cattle, hay)
- Rotate every 2 to 3 weeks in growing season and rest, preferably for 6 weeks each time
- Do not graze below 2.5 – 5 cm: *not* how to restrict intake

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Be aware:

- New growth is the most nutritious, and grass which is grazed to 2.5-6.5 cm is the most productive
- Grass grazed shorter than this will gradually be damaged
- Grass which grows to 8cm or more becomes relatively less productive
- Different grass species grow at different rates

Managing fertility

Too high: danger to horse and to species rich grassland

Too low: poor growth and weeds

- Artificial nitrogen provides large amounts of low fibre, high carbohydrate grass – danger of laminitis, obesity, insulin resistance and joint deformities
- Clover fixes nitrogen – slower growth but can be too high in starch & sugars
- Organic fertiliser (farmyard manure) applied every few years (4 to 10) should be sufficient

Horses and flowers

- Graze selectively

Be aware:

Grass-only swards have less fibre content and fewer vitamins and minerals than swards which are a combination of grasses and flowers

2. Latrine areas

- **For droppings and urination: returning nutrients to the soil**
- **Horses avoid grazing**
- **Grow rank and weedy**
- **Particularly encourage nettles and thistles**
- **Thought to be a natural method of parasite control**

Roughs can limit grazing area to between 10 and 50% of the field.

Managing latrines

- Avoid weeds and even up fertility
- Pick up droppings – benefits and disadvantages
- Partially pick up droppings
- Harrow, combined with resting and sensible worming programme
- Cut rank growth regularly and collect or move cuttings
- Graze with sheep or cattle

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When to pick up droppings






- Where horses are suspected of having high worm count, or when using ivermectin
- On species-rich grassland with moderately high stocking
- On very small paddocks
- Where looks – tidiness – is paramount
- Where grazing is heavy and harrowing or cutting cannot be carried out

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A word on worming

- Worms can cause internal damage and in the worse cases can be fatal, especially in young horses
- Worms must complete their life cycle in pasture, and can exist for long periods in grass
- Resistance of worms to standard wormers is growing, especially ivermectin – which is also wildlife unfriendly
- Worming should take place at the right intervals for the circumstances; adult horses may only require worming twice yearly
- Faecal worm counts are valuable for deciding whether worming is required

3. Bare ground

- Natural behaviour – rolling, congregating
- Horse paths (and fence walking)
- Water sources
- Winter turn-out
- Summer drought

Summer: bare ground

- Create paths and bare patches, congregate in shade, near water and gates

Winter mud

- Bare soil will quickly turn to mud: avoid poaching and keep a good vegetation cover
- The same vegetation won't grow back!
- Long-term damage can be done to the soil

Winter turn-out solutions

- Shut up pasture in early autumn so there is good growth for winter
- Give access to all the land while grass is not growing - if it is dry enough
- If rotating, move horses out as soon as there is any damage – it can recover
- Use a suitable sacrifice paddock and re-sow
- Use indoor and outdoor yards, arenas, all-weather surfaces (including mesh)

Problems of compaction

- Effect on plant growth
- Erosion and run-off
- Lack of organic matter
- Lack of soil organisms

Solutions

- Avoid machinery use and treading in wet weather
- Harrow, aerate and subsoil

4. Weed control

Weeds are flowers which are aggressive opportunists taking over from vegetation which is more appropriate in that place

Why weeds occur

- Lack of competition
- Fertility
- Disturbance






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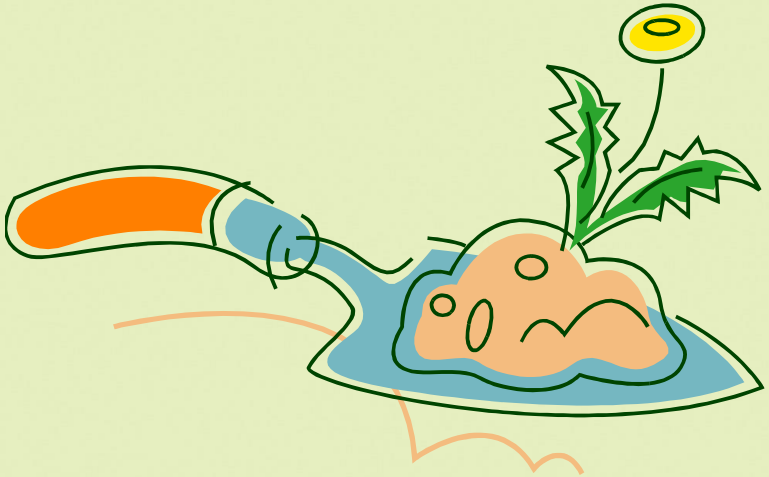
Injurious Weeds



- Ragwort
- Thistles
- Docks






Occupiers of land must control the spread of injurious weeds (ragwort, creeping and spear thistle, broad-leaved and curled dock) if required, or if ragwort presents a high risk to grazing livestock.

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Ragwort

- Flowers June-Oct, seeds Aug-Sept
- Discouraged by dense, fertile sward
- Encouraged by overgrazing, winter poaching, rabbit grazing, cutting, light soils
- Most seeds fall within 5m, but can be spread by water and persist in soil
- Best controlled by digging out in spring, but roots can regenerate and seeds establish

Thistles

- Creeping: flowers Jun/Jul-Oct/Nov
- Spreads mainly by roots, not seed
- Cut constantly from first appearance of flower

- Spear: flowers July-Sept
- Spreads by seed
- Cut or knock down in July
- Dig out young rosettes

Docks

- **Particularly found on heavy, fertile, disturbed soils**
- **Flower from June, spread by seed and roots**
- **Dig up in spring, including top of roots, and remove**
- **Spray before flowering**

Nettles

- Like latrine areas in particular
- Cut constantly from first appearance and move from patch
- Re-sow bare areas
- Spray and remove wilted plants
- Nettles are full of nutrients and palatable when wilted

Buttercups

- Several different species: three found in pastures and meadows
- Levels of toxicity, but very bitter
- No problem when cut or in hay
- Creeping buttercup a problem if it takes over from grass
- Sign of dampness and overgrazing
- Harrow, spray or dig out by hand

Bracken

- Spore cases lie on the under edge of bracken fronds
- Spores ripen July to September
- Cut repeatedly from mid June
- Or roll or chain harrow or trample in spring
- Or spray with dedicated products
- Re-seed old bracken patches

Things to consider

- Ploughing and reseeding
  - can encourage weed seed spread
  - may ruin good turf and sward
  - may be illegal
- Sprays and spraying
  - can destroy important plant species
  - many products require licensed sprayer
  - withdrawal periods and persistence
- Fertiliser
  - can be dangerous for horse and sward

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Diversity in grazing

- Horses have particular preferences for different species
- More species give a longer growing season and more potential for providing vitamins and minerals
- Species-rich swards are low in sugars, high in fibre
- Horses eat a selection of species leaving others to flower and seed
- Selectivity relieves boredom and can keep weight down!
- Junk food?
- Species-rich swards are more sustainable

Best practice for horses

1. Provide enough land
2. Avoid fertiliser
3. Avoid overgrazing
4. Rest pastures, intergraze if possible
5. Manage latrines
6. Manage winter turnout
7. Manage weeds
8. Diversify if possible






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Best practice in the wider countryside

- Landscape
  - fencing and hedges
  - buildings and equipment
  - grass condition
- Resources
  - soil and water
- Biodiversity
  - species-rich grassland
  - trees and hedgerows
  - wildlife






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Fencing in the landscape

What lives with your horse?

- Weeds, seeds and flowerheads
- Invertebrates – above and below ground
- Birds
- Mammals and other animals
- Trees and hedges
- Ponds and streams






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Richard Knight


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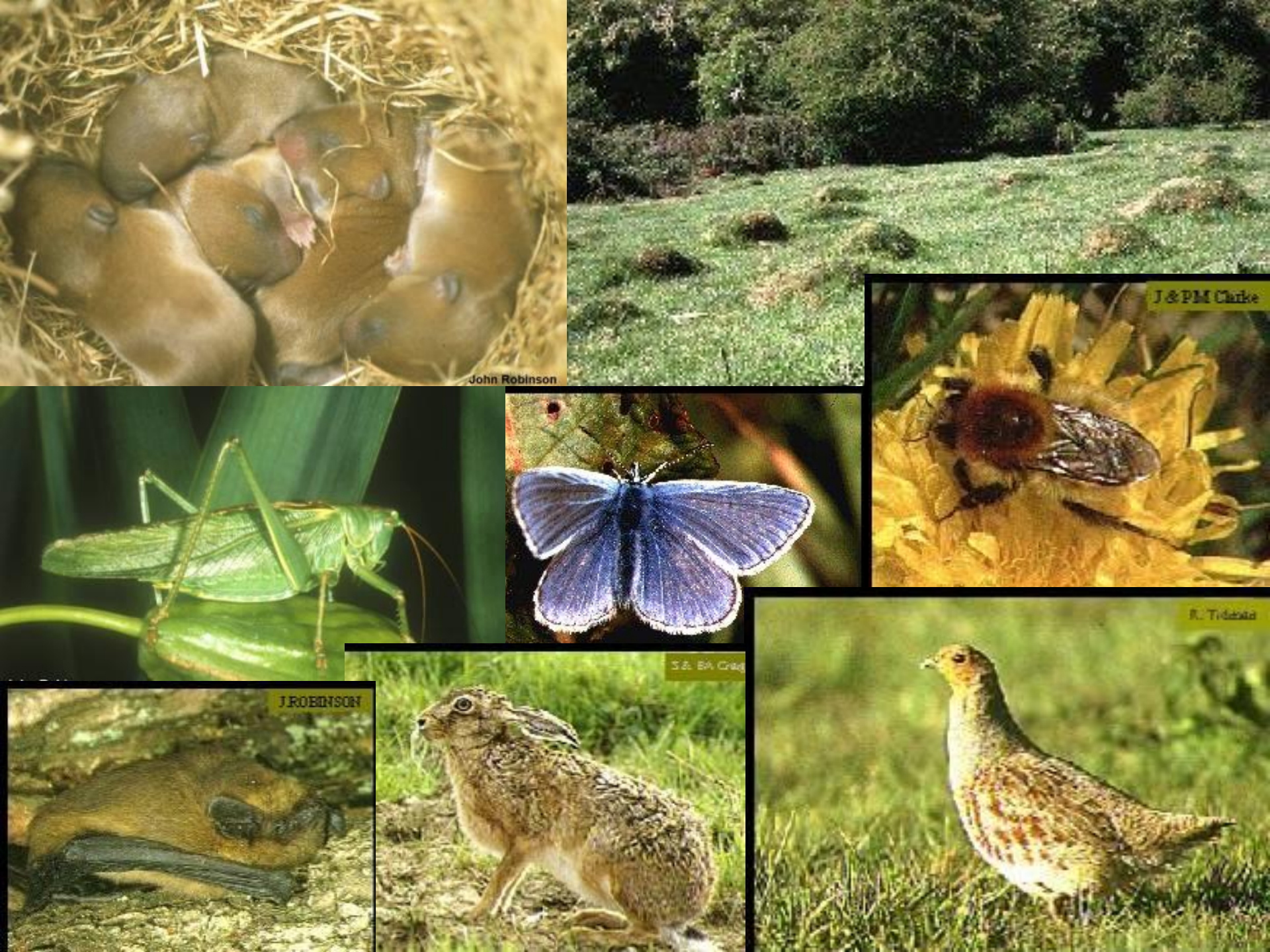
Richard Knight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