# Trees Outside Woodlands scheme

This government funded project seeks innovative and sustainable ways of increasing tree cover in Shropshire

Shropshire Council has a target to plant 345,000 trees in the county by 2030

We see agroforestry as a key way to achieve this target and have funding to help farmers and landowners plant more trees on their land

1 Agroforestry & Orchards scheme

2 Community tree nurseries

3 Free tree scheme

# What is agroforestry?

Agroforestry has a rich history of development and has been practised in some parts of the world for more than 6000 years

Crops, trees and animals have been combined on the same area of land in the UK for centuries. Pigs were traditionally allowed to forage for acorns under broadleaved woodland and the practice was known as ‘pannage’.

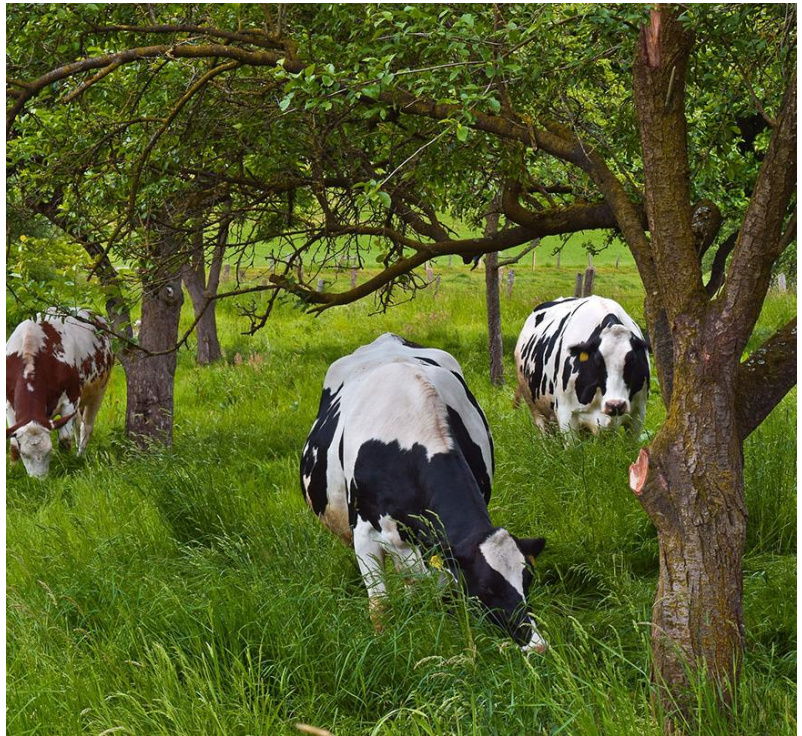
Since 1950, there has been a separation of agriculture, fruit production, and forestry into distinct disciplines, as part of a more industrial and ‘efficient’ form of farming.

## 1 Agroforestry & orchards

Agroforestry in its simplest terms is farming with trees.

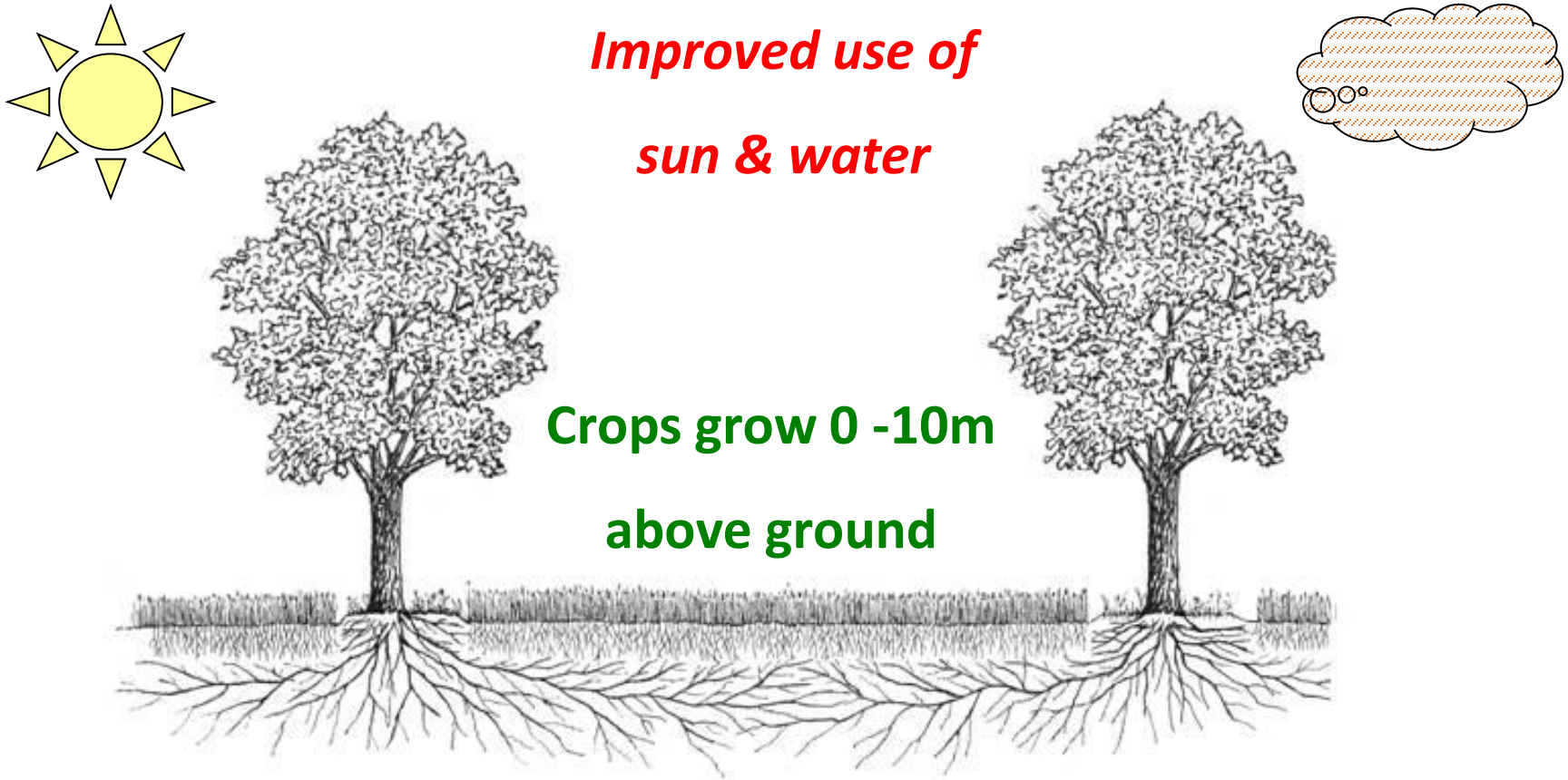
It’s a great way to get more trees in farmland and still produce the food that we need

Silvoarable



Silvopasture

# Maximising resources



***Improved use of***

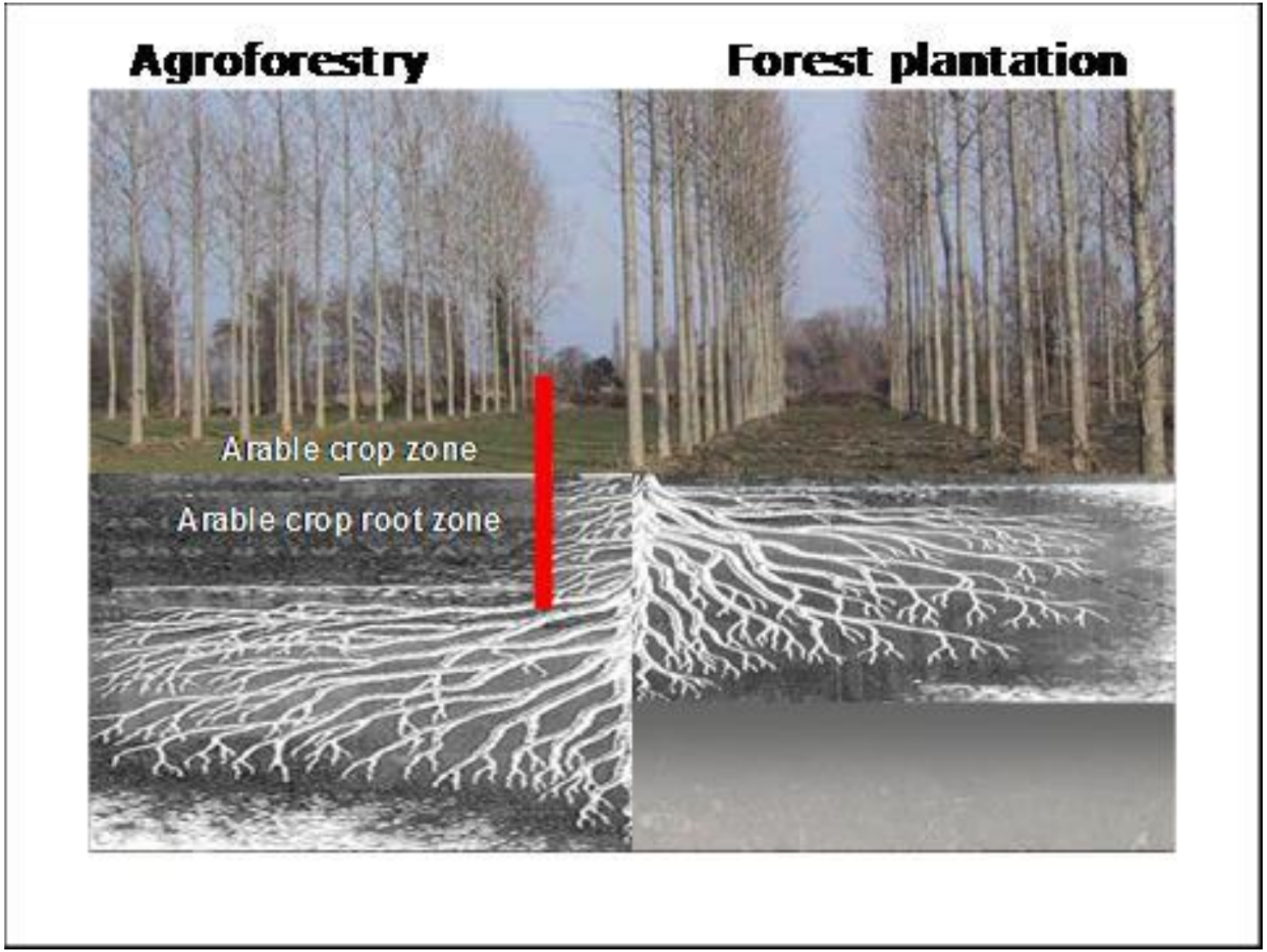
***sun & water***

**Crops grow 0 -10m**

**above ground**

**Improved root spread,**

**nutrient use & reduced leaching**


Agroforestry
Forest plantation
Arable crop zone
Arable crop root zone

In any agroforestry system we need to be aware of competition for

Light
Water
Nutrients

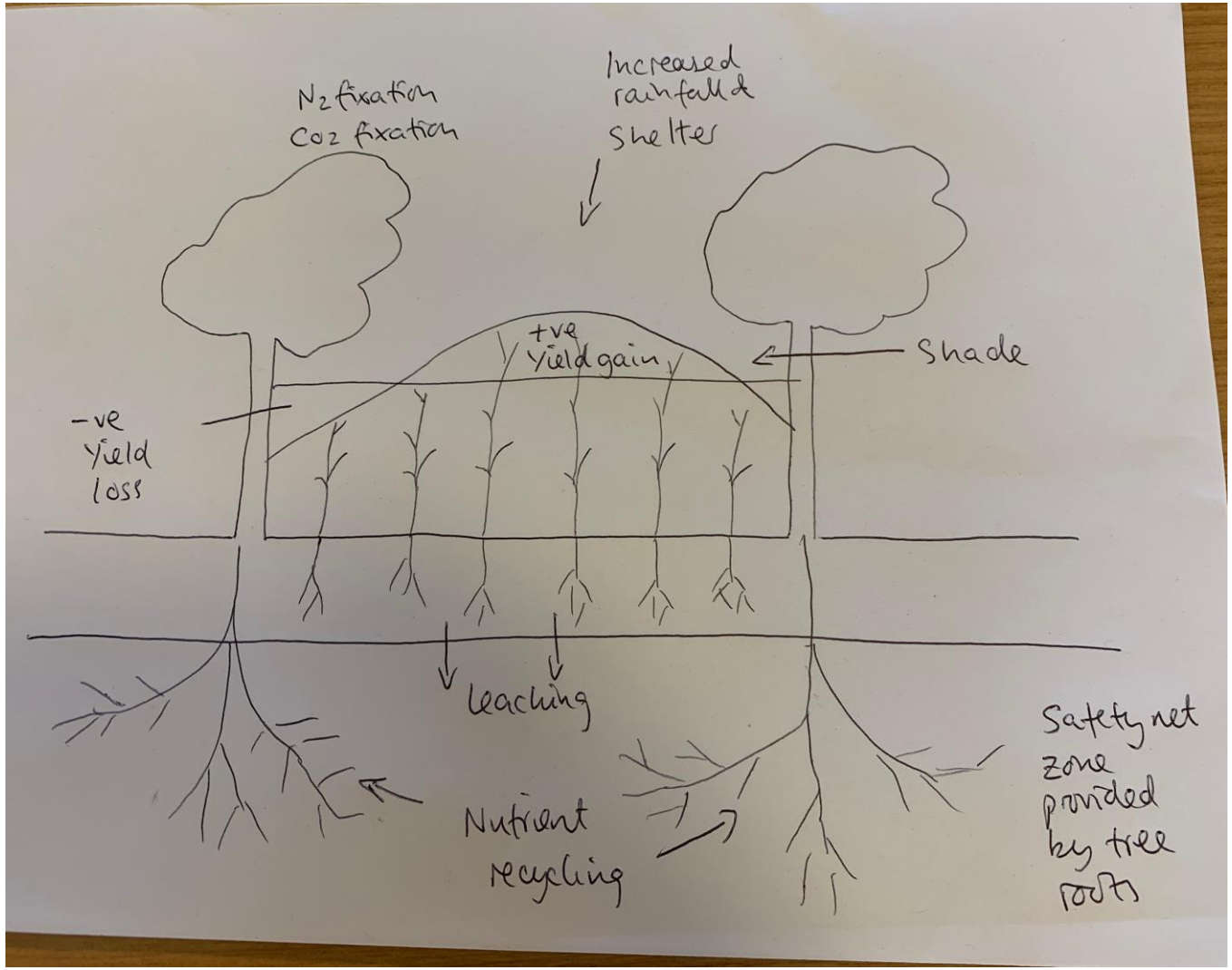
We want to avoid shading the crop and competition for water and nutrients between the trees and other plants

However, the trees may have benefits, including:

Shelter from winds leading to higher temperatures and reduced evapotranspiration

Nutrient retention and recycling from tree roots accessing deeper soil horizons

Fixing of atmospheric nitrogen



# Other benefits of Agroforestry

# Soil Health
# and nutrients

Trees bring up nutrients from deep

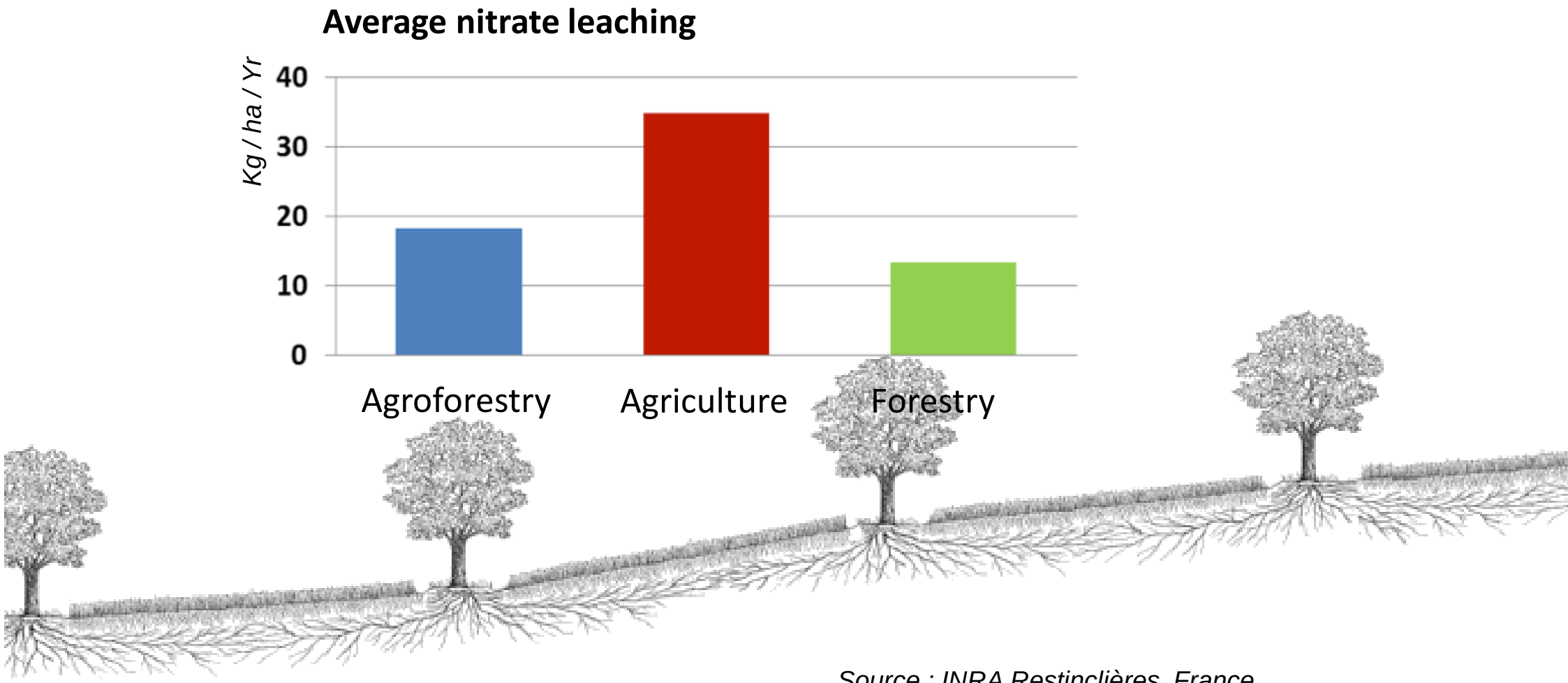
Leaf fall provides fertiliser and organic matter

Nutrients available to crops

# Water

- Reduced run off / reduced flood risk
- And the water that does run of is usually better quality  for instance Buffer strips can significantly decrease pollution run-off, with reductions of 70-90% reported for suspended solids, 60-98% for phosphorus and 70-95% for nitrogen

# Reduced nitrogen leaching




*Source : INRA Restinclières, France*

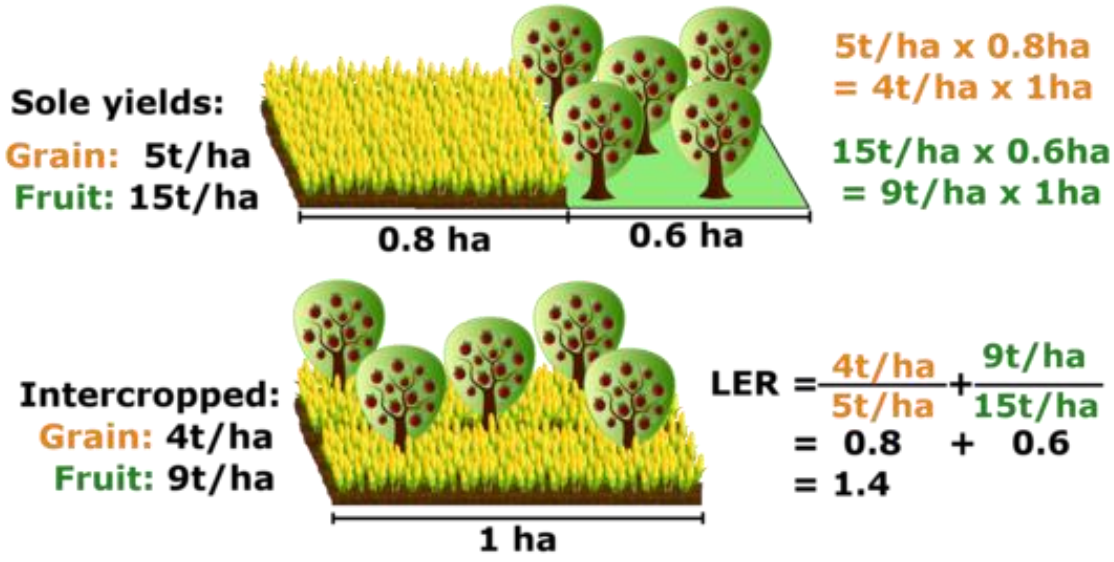
# Wind

- Slowing down wind speeds
- Creating microclimates
- Reduces erosion

Productivity benefits:

- Improved animal health and welfare from shade and shelter from trees leads to higher milk production and weight gain in livestock
- More resilient harvest with added income from timber, fruit, nuts and biochar
- Reduced cost of inputs due to browse from trees replacing bought in feeds
- Nitrogen fixing trees such as Alder can help the grass sward

If you compare a field of wheat and a traditional orchard with a silvoarable system with fruit trees and cereals, the yield from the single crop system will be higher.  However, with the agroforestry system we have two crops, so how do we compare the yield?




An LER of 1.4 means that we need 1.4 hectares of monoculture grain and fruit to produce the same yield as a 1 hectare agroforestry system with the same crops

Land equivalent ratio (LER) = (Yield A AF/Similar Yield A S + Yield B AF/Similar Yield  B S)

Yield A = Apples Yield B = cereal crop AF = Agroforestry S = Single crop

# Crop health

- Wider spacing for trees reduced disease
- Animals eating pests and crop residues
- More beneficial insects (pollinators and predators)

# Resilience

- Diversity of crops and markets
- Resilience of soil and farming system
- longer-term returns on investment can be attractive

Pest & disease benefits:

- Trees dry out the ground which leads to fewer fungal problems such as foot rot
- There are more dung beetles in a silvopastoral system, which leads to reduced manure in the pasture and fewer flies
- Mineral rich browse from trees can help the health of livestock and reduce the occurence of intestinal worms

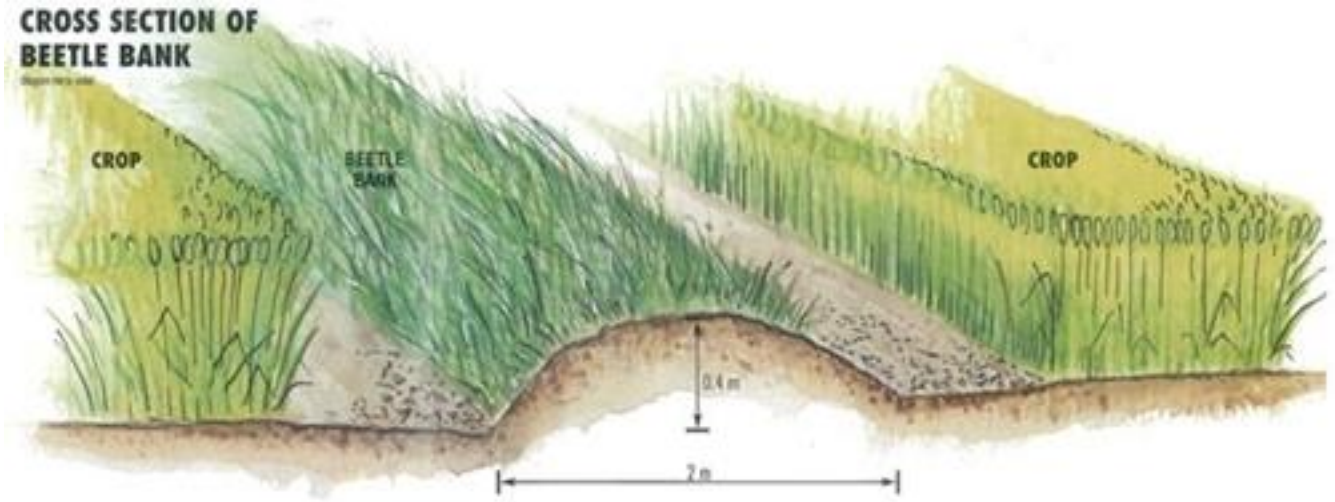
Environmental benefits:

- Reduced flooding, surface runoff and pollution of nearby waterways
- Increased biodiversity of the farm in terms of insects, birds and mammals
- Carbon sequestration by the trees can help combat climate change


# Biodiversity and pest numbers

Anyone interested in permaculture or organic gardening will know that the more diverse a system, ie the more types of plants, the better it is for biodiversity and plant health.

In a monoculture there is only food for pests. In a polyculture such as an agroforestry system, where there is food and shelter for predators, we will not usually reach damaging pest populations and need to resort to chemical sprays and pesticides.




Beetle banks like the one above, can be planted with legumes and wild flowers beneath the trees and form a vital habitat for insect predators and pollinators alike.

# Agroforestry systems

## 1 Windbreaks/shelterbelts

Description: Line or strip of trees along field/paddock boundary
Benefits: Shelter, shade, soil protection, browse & timber
Tree species: mixed species, including Lombardy poplar, alder, western red cedar and scots pine
Tree protection: wire fencing and individual tree guards

2 Silvopoultry

Description: Poultry under trees or between lines of trees
Benefits: Shade, shelter, natural animal behaviour and additional tree crops
Tree species: mixed trees, including fruit, nuts and timber species
Tree protection: individual tree guards

3. Wood pasture

Description: Livestock under widely spaced grazeable woodland trees
Benefits: Shelter, shade and browse
Tree species: Willow, alder, rowan, oak, hazel, lime, hornbeam, crab apple, scots pine, walnut, alder buckthorn, wild service tree, cherry, birch & hawthorn
Tree protection: Fencing and individual tree guards. Can keep the stock out until the trees are more established

4 Parkland

Description: widely spaced standard trees in open pasture
Benefits: Shade, shelter and additional timber crop
Tree species: oak, beech, sycamore, ash and sweet chestnut
Tree protection: Post and rail or metal tree guards

5 Trees in grazed fields (Silvopasture)

Description: Rows of trees with alleys of pasture
Benefits: Shade, shelter, browse, additional tree crops
Tree species: Mixed late leafing & nitrogen fixing species, such as alder, honey locust, black locust, hornbeam and poplars. Willows, mulberry, ash & elm for browse.
Tree protection: Electric fencing and individual tree guards
Typical pasture alleys between the tree rows are 12-24m wide.

6 Trees in arable fields (siloarable)

Description: Rows of trees with alleys of arable crops or vegetables
Benefits: Shade, shelter, soil protection, nutrient recycling, additional tree crops, including timber, fruit & nuts
Tree species: Mixed species, including apples and other fruit, hazel for nuts or biomass, and timber species
Tree protection: Individual tree guards

The alleys between the tree rows are typically aligned north south to allow maximum light to reach the crops and are between 12 and 24m wide to allow easy access by farm machinery.

Orchards

Description: Traditional widely spaced fruit trees with grass underneath, linear orchards and community orchards.
Benefits: Fruit crop and pasture
Tree species: Apple, pear, cherry, plum, damson, gages.
Tree protection:  Individual tree guards or wire mesh guards if livestock present.

# If it’s that great
# why isn’t everyone doing it?

**Skills**

Farmers unlikely to have relevant knowledge of how to grow trees for particular crops

**Protection**

Cost / hassle, particularly if grazing

**Markets**

As with any new enterprise need to be really clear about markets for potential crops
Primary – apples, nuts, timber, fodder
Secondary – juice, oil, woodchip

**Farm subsidies**

# Paying for Agroforestry

- Farmer
- Private
- Government
- Community

# UK Agroforestry
# Current policy

## 2 Community tree nurseries

We want to increase the supply of local provenance biosecure tree stock for planting in the county.

## 3 free tree scheme

As part of our efforts to increase tree cover in Shropshire, we are giving away free trees this autumn for landowners, schools, councils, community groups and homeowners.

We are supplying bundles of trees (cat not included), with mixes of native trees for planting on suitable land and hedgerow species for creating new or infilling existing hedges.

# Summary

There is only so much low grade agricultural land that is suited to planting new woodland, so if we are going to plant 345,000 trees by 2030 **we need to think outside the woods** and look at agroforestry as the possible solution.

Any Questions???