

AGRICULTURAL SCIENCE STUDY GUIDE

Week 10



Forestry

Author: Gemma Dunphy, Coláiste Mhuire, Johnstown, Co Kilkenny

Increase in farm forestry

Designed to assist farmers in creating long-term investments, farm forestry is assisted by grant aid and premiums from the Forest Service and the EU

Farm forestry has significantly increased in recent years. There has been an increase in the availability of fertile lowlands for planting, while farm forestry is also creating an opportunity to increase the diversity of Ireland's forest resource.

Trees as a crop

As farm forestry is increasing among farmers as a crop for sale, forestry and tree production is now a topic students can consider as a crop for a crop project as well as a topic to be understood to answer an exam question on.

☞ Forestry is a long-term crop that can be planted on poor-quality soils.

☞ Trees have optimum conditions for growth.

☞ Natural forests: results of areas of land reaching their vegetative ecological forest climax and being allowed to remain in that condition.

☞ Planted forests: commercial forests are managed at all stages of growth before being harvested.

☞ Conifers are used in commercial forestry.

☞ Coniferous forests have a fast growth: they grow satisfactorily on poor soils.

Conifers:

☞ Scot's pine.

☞ Sitka spruce: chipboard, fibreboard, pallet wood and construction timber.

☞ Lodge pole pine: chipboard, fibreboard and pallet wood.

Broadleaf:

Oak, ash, birch and alder (nitrogen fixing).

Fertiliser requirement

☞ Require small amounts of soil nutrients.

☞ Minerals are released from parent rock material by chemical and biological weathering (K).

☞ Most soils have sufficient nutrients to meet tree requirements.

☞ Bacteria and other soil organisms release nutrients from humus and other organic matter (N).

☞ Soil pH affects availability of P.

☞ Common practice to apply P in the form of ground rock phosphate.

☞ Rate of application of ground rock phosphate is 250kg ha⁻¹ or 100g per tree.

Ground rock phosphate

Ground rock phosphate is used as a fertiliser in forestry.

☞ Most forests are located on acidic soils.

☞ Phosphorous availability reduces at low pH.

☞ Ground rock phosphate is released slowly.

☞ Available for uptake by trees over a long period of time.

☞ The slow release of P would not be suitable for growing short-term crops.

☞ **Brushing:** a process whereby lower branches are removed from trees to make a path before thinning.

Cultivation practices for forestry

☞ Trees will not grow satisfactorily on



waterlogged soils: they must be artificially drained.

☞ Trees are sown 2m x 2m apart.

☞ Planted on mounds: trees on drained land.

☞ Planted on flat: trees on undrained (undisturbed) ground.

☞ Fertilised using ground rock phosphate.

☞ After 18 to 20 years, thinning is carried out.

☞ Final harvest/clear felling is the total clearance of trees from the area: most valuable timber.

☞ Stump clearance can be done mechanically or the stumps and debris can be allowed to decay naturally.

☞ Debris left after felling is either burned or left where it is.

☞ Way is clear for replanting 2m x 2m placing between the rotting stumps.

☞ Clear felling: final recovery stage = 40 years.

Planting/thinning strategy

There are two types of harvesting in Irish forestry: thinning and clear felling.

Trees are planted at a 2m x 2m spacing for two reasons:

☞ Dense planting allows a high degree of selection among trees: better trees grow well at the expense of poorer trees. The process is enhanced by thinning. The final stand trees are usually very good size and quality.

☞ Dense planting causes trees to grow tall and straight as they compete for light. It suppresses side-branch development

and hence knots. Best-quality timber and best yield of saw-log timber is obtained from trees which are long, straight, free of knots and with minimum taper.

Fencing, pest and weed control

Fencing

☞ Planted areas must be securely fenced.

☞ Three-strand barbed wire, post 4m apart.

☞ Keep cattle, sheep and other animals out to avoid trample damage of young trees.

Pests

☞ Rabbits/hares nibble the bark or bite the top of stems.

☞ Should be driven out of the forest and fencing reinforced.

☞ Insects and other pests cause only temporary setbacks and are assumed already in long-term predictions.

Weeds

☞ A weed control strategy should be in place in the first few years of forest growth.

☞ Weeds greatly limit tree growth.

☞ They can collapse on to trees in the first winter, smothering and killing large numbers of up to 100%.

☞ Two years after planting, trees are weed height (on mound).

☞ Three years after planting, trees are weed height (on flat).

☞ Controlled chemically: sprays/pellets.

☞ Controlled physically: trampling/cutting.

Dense planting allows a high degree of selection among trees.

Table 1: Soil type and forestry suitability

Soil	Forestry suitability
Acid brown earth	Very suitable for broadleaf and conifer plantations
Brown podzolic	Very suitable for broadleaf and conifer plantations
Grey-brown podzolic	Very suitable for broadleaf and conifer plantations
Podzols	Mainly suited for conifer
Peaty podzol	Unsuitable for broadleaf plantations; conifers will grow on this soil
Glays	Suitable for spruce plantations and a limited range of broadleaves
Peat	When drained, basin peat is suitable for conifer and some broadleaves

Table 2: Deficiencies

Nitrogen deficiency	Phosphate deficiency	Potassium deficiency
Reduced growth	Poor height/leader growth	Partial yellowing of needles(base of needles remains green and top is yellow)
Light-green or yellowing of foliage	Dull foliage colour	Complete yellowing of needles at the end shoots (Douglas fir, spruces and larches only)
Uniform yellowing over whole tree	Possible necrosis of older needles in severe cases	Pronounced symptoms towards the end of winter
Smaller needles/leaves	Needles growing parallel to branches	