

## Answers to natural regeneration self-test

Relevant sections of Operational Guidance Booklet 7 (OGB7) are referenced in square brackets, e.g. [pg 23-25]

1. Which of the following statements about natural regeneration are true?

Natural regeneration is:

- A. easy to achieve when about 5% of trees have up to 50 cones per tree;  
**FALSE: seed production is one of the main constraints to natural regeneration and you are unlikely to be successful with this level of coning [pg 22-24].**
- B. a good method of regeneration where deer densities are high because it produces lots of seedlings;  
**FALSE: browsing is a major constraint to natural regeneration; consider management of the population and/or exclusion [pg 29-30].**
- C. unpredictable and sometimes difficult to achieve;  
**TRUE**
- D. suitable for all sites because once you understand the process it is possible to produce generalised prescriptions.  
**FALSE [pg 21-31]**

2. In which of the following situations is natural regeneration generally easier.

In woodlands:

- A. on moisture retaining, heavy and fertile soils (e.g. W8 woodland);  
**NO: these sites will generally have a dense, vigorous ground flora that will hinder the development of natural regeneration. Canopy opening will improve conditions for the ground flora [pg 26-29].**
- B. with a full canopy of dominant trees produced by crown thinning;  
**YES: this will provide a seed source and a degree of control over the ground flora [pg 22-24].**
- C. on light, dry infertile soils (e.g. W16 woodland);  
**YES: these sites generally have a weaker ground flora that is less likely to hinder the development of natural regeneration [pg 26-29].**
- D. with a sparse canopy with occasional large trees.  
**NO: see the answer to 2B above [pg 22-24].**

3. Which of the following statements about seed production are correct?

- A. it is not necessary for trees in a stand to produce seed to achieve natural regeneration;  
**CORRECT: seed may be dispersed from surrounding stands, as often seen with western hemlock. If you specifically want to regenerate the trees in the stand then it is necessary for them to produce seed.**
- B. the main period of seed dispersal for conifers is the Spring; except SP, CP and EL which release seed in Autumn through to Spring;  
**INCORRECT: it is the other way around [pg 22-23]**
- C. most conifers only start to produce large quantities of seed when they are 30-40 years-old;  
**CORRECT: [pg 22-24]**
- D. Most tree seed is dispersed by the wind and will usually fall at least 50 m from the parent tree.  
**INCORRECT: most seed will fall with 2-3 tree lengths [pg 24].**

4. Which of the following statements about seed germination are true.
- A. an important precondition for germination of most tree seed is access to light;  
FALSE: temperature and moisture are the main controlling factors for the germination of tree seed.
  - B. seed of some tree species can lie dormant in the soil;  
TRUE: however, conifer seed rarely lie dormant for more than 12 months. Ash is the main species that has 'doubly dormant' seed, requiring a period of moisture and warmth followed by chilling for dormancy to be broken; consequently, seedlings do not appear until the second spring after seedfall.
  - C. a good environment for germination of tree seed is to be buried in mineral soil;  
TRUE: mineral soil will give the best chances of a continuous supply of water and nutrients for germination along with a degree of protection if the seed is buried.
  - D. a good environment for germination of tree seed is to be buried in organic matter.  
FALSE: seed will germinate in organic matter but during the summer this may dry out and water and nutrients will not be available for germination and growth.
5. In order to improve conditions for germination of tree seed much continental literature recommends the use of ground preparation. In which of the following situations would the use of ground preparation be beneficial for natural regeneration?
- A. on light soils with a thick cover of vegetation and sparse canopy;  
YES disturbance will improve opportunities for natural regeneration and the control effect on the ground flora will probably last longer than on richer, wetter sites.
  - B. on thin base rich soils overlying chalk or limestone;  
NO: this is likely to lead to a more diverse and well-developed ground flora that will hinder natural regeneration.
  - C. on all sites;  
NO: see 5A and 5B above.
  - D. on sites where there is a thick layer of organic matter.  
YES: see answer to 4D, removing the layer of organic matter may improve access to mineral soil and therefore temporarily improve conditions. With time other plants will take advantage of the change and regenerate so the improvement will decline.
6. What do you understand by the term advance regeneration?
- A. seedlings produced from tree seed with low dormancy;  
NO
  - B. seedlings which are above the height of existing vegetation;  
NO
  - C. seedlings which are present beneath the canopy before regeneration fellings occur;  
YES [pg 16]
  - D. seedlings which have grown beyond the browse level of animals in the area.  
NO

7. Why is the presence of advance regeneration useful?
- A. it is a reliable indicator of likely success;  
YES: conditions for regeneration have been good at some time in the past and could be repeated in the future.
  - B. if present in sufficient densities managers should plan to ensure its survival;  
YES: assuming that the species are desirable. The main factors influencing the development of advance regeneration are stand conditions, competitive weeds and browsing [pg 26-30].
  - C. if not present it is important to understand the factors which have caused this;  
YES [pg 16-18]
  - D. it reduces the need to protect trees from mammal damage.  
NO
8. A well developed ground flora of competitive plants can adversely affect seedling growth, which of the following are suitable methods of vegetation control for natural regeneration: yes (Y), possibly (P) or no (N).
- A. Application of glyphosate as an overall spray.  
P - if there is no regeneration present and you are attempting to improve conditions then this could be a suitable method. Always consider options for reducing use of pesticides as described in 'Reducing pesticides in forestry'\*.
  - B. Maintaining canopy cover.  
Y [pg 26-29]
  - C. Use of treeshelters.  
N - but they can help to mark regenerating trees and ease the application of contact herbicides.
  - D. Non-intervention in areas of dense regeneration.  
Y – always consider the 'do nothing option'; the regeneration is well established and does not require any intervention.
9. In order to control the rate of canopy removal once regeneration has established it is important to know the light requirements of young seedlings, are the following shade tolerant (S) intermediate (I), or intolerant (light demanding, L).
- A. Sitka spruce (I)
  - B. Norway spruce (S)
  - C. Scots pine (L)
  - D. Grand fir (S)
  - E. Western hemlock (S)
  - F. Douglas fir (I)
  - G. European larch (L) [see Table 3 of FCIN29]
10. The effects of animals on natural regeneration can be both helpful and harmful, which of the following are true statements:
- A. birds and small mammals can help natural regeneration by dispersing seed such as oak, holly and hawthorn;  
TRUE this can be an important process in the colonisation of bare ground.
  - B. relatively large seeds such as Douglas fir and Corsican pine are less susceptible to predation because they tend to bury themselves when they fall off the tree;  
FALSE
  - C. browsing is an important factor preventing the development of advance regeneration;  
TRUE [pg 29-30]

D. young regeneration which is taller than 60 cm is certain to survive no matter what the density of deer.

FALSE there is no guarantee for survival for any size of sapling or small tree. Fraying by deer and bark stripping by grey squirrels are two of the factors that can reduce the chances of survival.

\*WILLOUGHBY, I., EVANS, H., GIBBS, J., PEPPER, H., GREGORY, S., DEWAR, J., et al. (2004). *Reducing pesticide use in forestry*. Forestry Commission, Edinburgh.