

GROWCHECK

The application of fertilizer using ground-based machines in checked forest stands

PROJECT TEAM

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BACKGROUND

Coillte owns approximately 6,000 ha of checked Sitka spruce plantations in Galway and Mayo. These plantations are deficient in both P and N and occur mostly on peatlands. In order to bring these crops to maturity it is expected that on average two fertilizer applications will be required for most stands. Based on research from the 1980s it is reasonable to assume that most checked stands will respond to fertilizer applications, assuming that poor drainage and exposure are not limiting factors. Analysis by previous researchers suggests that spreading fertilizer using a helicopter is cost effective when it covers large areas. However, in recent years, due to stakeholders' requests, this option has not been used. As a result, there is a need to explore ground-based machines as a potential alternative to the use of helicopters for spreading fertilizer. The machine trial outlined in this report demonstrated the potential of using a ground-based machine to apply fertilizer in typical checked stands.

OBJECTIVE

To explore the practicality, feasibility and cost of applying fertilizer using ground-based machines in checked forest stands.

PROGRESS

The trial was completed in October 2008 in a typical west of Ireland checked stand of Sitka spruce on peatland and a detailed report was compiled. Analysis of the cost of using ground-based machines for fertilizing suggests that it is financially viable to fertilize these areas, based on current costs and revenues, if they can be taken out of check to a suitably high yield class. The trial also indicated that

spreading fertilizer using a ground-based machine is technically possible but more work will be needed to adapt the machine used in this trial if it is to be effective. These adaptations include, investigating the possibility of using a machine with a smaller effective width, ensuring calibration of spreader is correct, further investigation into the rate and variation of the spread rate of the fertilizer, improvements to the limiter function and the use of more sophisticated GPS guidance systems. Of these, the most critical from a cost perspective is the effective width of the machine. The majority of areas in check will at some point require fertilizer when the crop is at pre-thicket stage. For access reasons, the adoption of the machine used in this trial requires one line in seven to be felled to waste, with brashing along the adjoining line of trees to facilitate fertilizer ingress into the forest. This manual element has a significant cost implication on the overall financial viability and it is recommended that further investigation on machines with smaller effective widths be evaluated.

ACTIVITIES PLANNED

The trial and final report are complete.

OUTPUTS

Tiernan, D. and Flannery, M. 2008. GROWCHECK (Fertilizer machine trial). Coillte, Newtownmountkennedy, Co Wicklow, Ireland. Unpublished.



Spreading scenarios: left) open canopy; right) pre-thicket.