

Future changes and innovations in Cultivated Forest Management

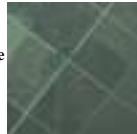
Possible impacts on biodiversity and forest health Implications for research

1. Temporal scale: a cutting cycle



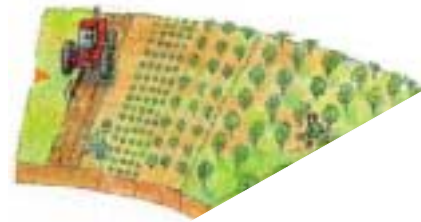
2. Main issue

- Hypothesis (scenario)
- Spatial scale: from stand to landscape
- Main processes
- Indicators
- Experimental design



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1. Planting



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1. Main issue # 1: tree/plant species diversity

2. Hypothesis:

- still pure productive stands but ...
- in the gaps: hedgerows, relict woodlands, amenity plantings

3. Impact and research implications

	<i>scale</i>	<i>process</i>	<i>indicator</i>
Biodiversity	stand to landscape	- habitat diversity - habitat complexity (ecotone, niche complementation)	Species Assemblages (bird, insect, plant)
Forest health	stand to landscape	- host accessibility - impact of natural enemies - associational susceptibility	Populations Metapopulations (pest, disease)

4. Experimental design

Network of plantation landscapes with increasing complexity of habitat (tree species) diversity

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1. Main issue # 2: exotic tree species

2. Hypothesis:

- introduction/development of exotic tree plantations
- as a response to global warming or industrial needs

3. Impact and research implications

	<i>scale</i>	<i>process</i>	<i>indicator</i>
Biodiversity	stand to landscape	- invasion, wilding - habitat diversity	Species Assemblages (bird, insect, plant)
Forest health	stand	- shift of native pests - invasion of exotic pests	Populations (native, exotic pest)

4. Experimental design

- Network of plantation landscapes with varying proportion of exotic tree stands
- Pair comparison exotic vs. native plantations

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2. Stand management



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1. Main issue: understorey management

2. Hypothesis:

- understorey preservation in pure productive stands
- (weeding, fertilising, draining effect on understorey)

3. Impact and research implications

	<i>scale</i>	<i>process</i>	<i>indicator</i>
Biodiversity	stand to landscape	- structural diversity - disturbance regime	Functional- response groups
Forest health	stand	- plant competition - impact of natural enemies - host accessibility	Populations (pest, disease)

4. Experimental design

Manipulative experiments with varying understorey structure, composition and disturbance regime in pure stands₆

3. Harvesting



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1. Main issue: **clear-cutting**

2. Hypothesis:

- change in clear-cut size, distribution in space and time
- retention concept (old trees, associated species, logs)

3. Impact and research implications

	<i>scale</i>	<i>process</i>	<i>indicator</i>
Biodiversity	landscape	- spatio-temporal dynamics (fragmentation, connectivity, colonisation)	Metapopulations
Forest health	stand to landscape	- retention & pest spatio-temporal dynamics	Metapopulations (pest, natural enemy)

4. Experimental design

Network of plantation landscapes with varying size, patchiness and frequency of clear-cuts (or manipulative experiments) 8