



Potential for marker-assisted selection for forest tree breeding: lessons from 20 years of MAS in crops

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Résumé en anglais	<p>For the most part, molecular markers and detection of quantitative trait loci have been developed for forest tree species in view to performing marker-assisted selection (MAS). However, MAS has not been applied to forest trees until now. In parallel, some success stories of MAS in crop breeding have been reported. Recently, genotyping techniques have undergone a tremendous increase in throughput, moving the trend from MAS to genomic selection. We analyzed 250 papers reporting the use of MAS in plant breeding and found that the most popular schemes used were gene pyramiding and marker-assisted backcross manipulating a single or very few genomic regions which have a major impact on crop value. We reviewed theoretical and simulation studies to identify the parametric space in which MAS is expected to bring about significant advantages over phenotypic selection. Then, we tried to explain why MAS has not been applied to forest trees and discuss the opportunities offered by recent advances in these species.</p>
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