A comparison of optimization models for lumber production planning

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Abstract
The performance of sawmills is strongly dependent on how logs are sawn into lumber in order to satisfy the customer demands. To do this, sawmill managers have to decide which cutting patterns have to be applied to logs of different dimensions. Optimization models have been proposed to assist decision makers in this process, but only the profit maximization and the cost minimization of the decisions have been considered as the models objective. In this paper, a linear optimization model was formulated to address lumber production planning and applied to a real problem. The current decisions at sawmills were compared with five different objective functions: the two previously mentioned plus waste minimization, log number minimization and production time minimization. Only profit maximization and waste minimization models reported positive economic returns. Although the current decision at sawmills also reported a positive economic return, the same economic result was obtained with significantly fewer resources using the waste minimization model. The effects of the different objectives on the production indicators were discussed.

Keywords
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