

## **The influence of wheel-type machine operation on black soil in Japan**

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In Japan, thinning is carried out mainly by simple skyline logging using swing yarders or winches and by forwarding on strip roads. However, the cut-to-length (CTL) operating system is often employed in the world as one of the most high productivity and safest thinning system. The operation of wheel-type machines used in CTL may cause problems since such machines apply higher ground pressure than crawler-type machines that are mainstream forest machines in Japan. Because of the steep terrain and various geological conditions, it is a challenge to develop an environment-friendly CTL operating system in Japan. The object of this study is to evaluate the influence of wheel-type machine operation in forests, especially in forests with black soil that is characterized by its softness, high moisture content, and high humus content.

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