



## **Estimation of the fascine efficiency in terms of runoff infiltration and sediments deposition**

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Runoff inundations and mudflows are more and more frequent phenomena.

In 2011, Belgium had a lot of its municipalities affected by this problematic. Since then, mitigation measures are more and more set up in agricultural watersheds.

The fascines are one of these measures which allow to protect the public and private infrastructures and in the same way, which don't reduce the farmers productivity. They consist in branches faggots piled up between two rows of stakes. These linear constructions are mainly put in place across concentrated runoff axis in order to slow down the water and to filter the mud.

Only few quantifications of their effectiveness (in terms of flow and concentration water reduction) exist and are however needed to better recommend these types of mitigation measures.

Our experiment aims at measuring discharge and mud concentration reduction due to the fascines in a completely defined context.

The tests were realised through fascines planted in field border. A watertight surface of 2,45m to 0,80m carries the water to the fascines.

Three types of fascines were tested (willow wood fascine, straw fascine, straw compacted fascine), three different water flows were applied (0,5L/s, 3L/s and 6L/s) and three water concentration in dry soil (13g/L, 26g/L, 38g/L) were used. The different factor combinations were tested.

The results show that we can expect a reduction of 60% of the flow for the biggest water flows (proportional efficiency with the water flow). The factor interaction study doesn't allow to see a difference between the type.

About the sediment water concentration, the filtration can reach 50%, the fascine with wood faggots showing a better efficiency.

Finally, the difference between the fascine type show that straw fascine can support a biggest watershed (25 hectares) than the wood faggot fascine can (5-10 hectares) but during a smaller return period (one year against five years).