

Development of a Sprinkling System Using Canola Oil for Dust Control in Pig Buildings

S.P. Lemay¹, E.M. Barber², M. Bantle³ and D. Marcotte¹

¹Prairie Swine Centre Inc.(PSCI), P.O. Box 21057, 2105 - 8th St. East, Saskatoon, SK S7H 5N9; ²College of Agriculture, University of Saskatchewan, Saskatoon, SK S7N 5A9; ³Bantle Engineering Research, P.O. Box 7805 Stn Main, Saskatoon, SK S7K 4R5
Email: lemay@sask.usask.ca

A sprinkling system using undiluted canola oil has been designed to control dust levels in pig buildings. The goal of the project was to build a low cost system with off-the-shelf material that would be able to provide the recommended oil application rates that have been established in previous experiments. Six different types of agricultural nozzles were tested in a laboratory experiment to identify a suitable nozzle for the system. The most promising nozzle was selected and the oil sprinkling system was built and installed in one grower-finisher room. The system operates at low pressure for given short periods in order to provide the desired application rates. The oil flow rate and floor distribution were measured in the room to verify the system capabilities. Using recommended oil application rates for dust control, the sprinkling system provided a dust mass concentration reduction of 79% compared with a non-treated room over a two weeks period. Respirable (0.5 to 5.0 μm) and inhalable ($\geq 0.5 \mu\text{m}$) dust particle counts were reduced by 73 and 80%, respectively. The system was effective in replicating previous dust reduction data obtained with manual equipment. However the system developed presents more advantages as it can be used to control dust levels in swine buildings with undiluted canola oil with minimal labour associated with its operation.

Implications:

The development of the oil sprinkling system is a step further in creating a safe, more pleasant environment in the barn that is likely to reduce barn worker turnover. The system developed at PSCI is made from off-the-shelf material and requires minimal labour for its operation.