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KAMON SUTTIJANNAPA : CONTROL OF DUST EMISSION FROM UNPAVED ROADS. THESIS ADVISOR : ASSOC. PROF. WONGPUN LIMPASENI, THESIS CO-ADVISOR : DR. SUPOT TEACHAVORASINSKUN, 174 pp. ISBN 974-334-677-5

The objectives of this research were to determine the dust emission rate and the efficiency of controlling dust emission from unpaved road by spraying water , asphalt emulsion and polymer emulsion, to compare the cost of different methods of controlling dust emission and to find the appropriate way of practice. The road was divided into 4 sections for different applications of spraying water , asphalt emulsion , polymer emulsion and controlled section (no application). The control efficiency was determined by measurement of dust concentration. In the field experiments, the 200-meters-long laterite road, which connects between villages, was chosen for the study.

The results show that dust emission rates from different sections of experimental road were between 0 - 1322 g PM-10/VKT at vehicle speed of 30 km/hr. The average efficiency of controlling TSP dust emission from unpaved road by spraying water at 0.5 l/m² twice per day is about 16%. The average efficiency of controlling TSP dust emission by spraying asphalt and polymer emulsion is about 31% and 0% respectively 8th month after spraying the chemicals. The average efficiency of controlling PM-10 dust emission by spraying water at 0.5 l/m² twice and five times/day, was about 39% and 72% respectively. The average efficiency of controlling PM-10 dust emission by spraying asphalt and polymer emulsion was about 40% and 33% respectively 8th month after spraying the chemicals.

The total estimated cost of controlling dust emission from unpaved road by spraying water at 0.5 l/m² twice and five times/day is about 1,042 and 1,105 baht/km/day. And the estimated cost of controlling dust emission by spraying water asphalt and polymer emulsion is about 63,000 and 950,000 baht/km respectively.

For higher efficiency of water spraying, it is necessary to spray water several times/day everyday, therefore water spraying is appropriate for a short period control method. The asphalt emulsion is appropriate for controlling dust emission of unpaved roads in villages where there is less traffic, therefore spraying these chemical may be done together with annual maintenance. And the polymer emulsion mixed with soil instead of water is appropriate for controlling dust emission in the construction of sub-based because of its adhesive property.

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