RECENT DEVELOPMENTS OF THE FEMS MODEL TO PROMOTE REALISTIC BUFFER ZONES FOR FUMIGANTS

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EPA's Science Advisory Panel approved two models for acute exposure for the application of developing buffer zones for agricultural fumigants, i.e. the FEMS and PERFUM models. This paper summarizes the recent developments and advances in the FEMS model that more realistically represent cultural practice and promote sound science through the inclusion of the state-of-the-art EPA dispersion model CALPUFF. This paper demonstrates the benefits of using the FEMS model to produce buffer zones that will effectively manage environmental impacts without the need to resort to excessive conservatism that could greatly hamper commercial agriculture. This paper compares differences in buffer zones for a hypothetical fumigant based on FEMS / ISCST3, FEMS / CALPUFF, and PERFUM. Unlike many comparisons made previously, this paper focuses on the differences for large commercial fields that typically are applied on a sequential basis over a number of days. There are very substantial differences in the features of these models to accurately represent this common and important scenario. The benefits of FEMS / CALPUFF to more accurate fit emissions data and thereby more accurately represent buffer zones is also demonstrated relative to the use of the standard ISCST3 model. Examples are provided comparing emission fitting based on the standard ISCST3 and CALPUFF models for nocturnal periods that are most problematic for the more simplified ISCST3 model and usually are the limiting cases in terms of buffer zones. This paper demonstrates that when comparable modeling tools are applied to agriculture, as are available to industrial sources, growers gain the benefit of more accurate model treatments and less restrictive buffer zones.