



## BioSIM: Optimizing Pest Control Efficacy in Forestry

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Branching Out  
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The success of forest pest control programs largely depends on pest vulnerability at the time of intervention. In order to improve the efficacy of pest control activities in the forest, researchers at the Canadian Forest Service developed BioSIM in the 1990s. This software links weather data with information on how the development of a given pest species is affected by temperature, in order to predict the timing of the various stages of its life cycle. Since its development, BioSIM has continued to evolve in response to increasingly diversified user needs. Version 10 is now available!



BioSIM's main purpose lies in the forecasting of features or "events" in the seasonal biology of pests and their host plants. These forecasts are generated through simulation models and are based on regional temperature and precipitation data from nearby meteorological stations, adjusted for differences in elevation, latitude and longitude using regional gradients.

BioSIM's specificity is based on its ability to combine normal and actual daily weather data (including short-term forecasts) in a single operation. The software can thus be used anywhere in the world and for any period, as long as weather data are available.

BioSIM 10 includes new models that can be used forecast the effects of meteorological conditions on physical processes (e.g. forest fires), and biological processes (e.g. plant growth and productivity, and insect pest development and performance). Used in conjunction with climate change scenarios, BioSIM also makes it possible to forecast the progression of physical and biological processes in a changing environment.

Largely used by the scientific community, BioSIM is also an indispensable decision support tool for any organization that monitors or manages insect pest populations, including the spruce budworm, western spruce budworm, gypsy moth, hemlock looper, jack pine budworm and the yellow-headed spruce sawfly. It can be used to plan prompt deployment of sampling or surveying teams and necessary materials (e.g. pheromone traps) without the need for intensive monitoring of the insect's development in the field. BioSIM also optimizes the use of pest control resources, and does so in a cost-effective manner.

### Useful links

<http://cfs.nrcan.gc.ca/projects/133>

<http://cfs.nrcan.gc.ca/publications/34818>

### A team effort

The development of BioSIM has been made possible thanks to the financial contribution of several Canadian Forest Service partners, including Spray Efficacy Research Group International (SERG-I), Forest Protection Limited (FPL), the Société de protection des forêts contre les insectes et les maladies (SOPFIM), the provincial governments of Newfoundland and Labrador, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia, and the USDA Forest Service.

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