2598: Modelling with Impact: developing insect population models to improve control in partnership with industry and policy

Wednesday, September 28, 2016
10:45 AM - 11:00 AM
Convention Center - West Hall F4 (WF4)

Introduction: The stable fly is a major nuisance insect with a global distribution and can mechanically transmit a range of important livestock and human pathogens. The stress and injury caused by its biting activity are estimated to cost the US cattle industry around $1billion/year. Its impact is projected to increase in regions including Brazil and Australia as a consequence of recent changes to the management of sugar cane and other vegetable waste. Better control methods for stable flies would therefore benefit animal welfare, bioenergy production and food production. We describe the process of developing a mechanistic model of *Stomoxys calcitrans* population dynamics for use in simulating improved insect control strategies and integrating inputs from industry and policymakers.

Methods: An explicitly spatial, deterministic model capable of describing *Stomoxys calcitrans*adult population dynamics was developed and fitted to field observations via a Bayesian statistical approach, taking priors from laboratory estimates of the relationship between temperature and life-history parameters and then adjusting to incorporate information derived from a field studies. Likely model users were identified prior to model development and user requirements and expectations defined. The model was iteratively refined in response to user feedback.

Results/Conclusion: We describe the performance of the model in terms of its ability to describe observed population dynamics and discuss its predictions of the effectiveness of alternative control strategies. We discuss the implications of integrating user inputs into the development of mechanistic population models as an early stage and identify benefits, challenges and lessons for future projects.

doi: 10.1603/ICE.2016.114728

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