

AGRICULTURAL
ECONOMICS AND
RURAL
SOCIOLOGY

M.E. JOHN SEMINAR SERIES

DATE: Friday,
November 6, 2009

TIME: 3:00-4:00 P.M.

LOCATION:
215 Armsby
Building

Co-sponsor – ENRI

November 13:

Tim Kelsey, PSU
Jim Ladlee, PSU
Jonathan Laughner, PSU
Joann Kowalski, PSU
Extension Educators

November 27:

No seminar

December 4:

Donald A. Brown
Environmental Ethics,
Science, and Law,
PSU

Dec. 17 or 18:

Tassos Haniotis,
European
Commission/EU



Janie Chermak; Dept.
of Economics,
University of New
Mexico

My Neighbor's Cattle: Strategic Behavior in a Spatial-dynamic Model with an Invasive Weed

We consider optimal behavior in a class of spatial-dynamic economic problems related to a negative externality with stock effects, via the development of a dynamic, non-cooperative game. The feedback Nash equilibrium response functions are parameterized based on an invasive weed faced by western US cattle ranchers. Dynamic simulations illustrate the trade-off between increasing costs of management efforts, the invasive's impact on productivity, and the temporal impact of growth of the invasive when another rancher's effort and infestation levels are taken into account. Under certain conditions optimal paths are characterized by relatively lower initial effort levels, illustrating the tradeoff of higher management costs today versus lower future profits. When simulations are generalized to include asymmetric infestation levels, the relatively smaller impact from a neighbor's lower level of infestation can dampen the optimal effort for the higher infestation level neighbor. The socially optimal and second-best alternatives are also considered.