

State Noxious Weed Seed Regulations: Economic or Scientific Decisions

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Noxious Weeds as Invasive Species

- Invasive Species
 - Nonnative, alien or exotic to the ecosystem under consideration
 - when introduced, cause or are likely to cause, economic or environmental harm or harm to human health
- Noxious Weeds
 - any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.

Federal Regulations

- Plant Protection Act (superseded Federal Noxious Weed Act)
 - *...the Secretary may publish, by regulation, a list of noxious weeds that are prohibited or restricted from entering the United States or that are subject to restrictions on interstate movement within the United States.*
- Federal Seed Act
 - *... noxious-weed seeds mean the seeds or bulblets of plants recognized as noxious by*
 - *law or rules and regulations of the state “or”*
 - *rules and regulations of the Secretary of Agriculture*
- Agriculture Bio-terrorism Act

Federal Lists

- Noxious Weed List
 - Listing by habitat: Terrestrial (most), aquatic/wetland and parasitic
- Noxious Weed Seed List
 - Seed Regulatory and Testing Branch (links to AMS)
 - NW ~ NWS
- APHIS (Jan. 2002 draft plan)
 - A1, weeds not in the US
 - A2, introduced weeds
 - B, regulated weeds
 - C, weeds of interest

State Noxious-Weed Regulation

- Two parts
 - Noxious Weed List
 - e.g., California – *“Noxious weed” means any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture or important native species, and difficult to control or eradicate, which the director, by regulation, designates to be a noxious weed.*
 - A, B, C, D and Q lists
 - A list (zero tolerance)
 - Other lists (apply to some counties)
 - Only a part of the state NW list is recognized in the administration of the FSA, referred to as Noxious-Weed Seed Requirements or List
 - Prohibited and restricted
 - e.g., 19 in prohibited, but 45 in A list

State Noxious-Weed Regulation

- Why does the FSA recognize only a part of the state NW list?
 - National versus state-specific ecological, environmental, agronomic and economic effects (or preferences)
 - RUSSL
- Only 24 states in 1997 and 36 in 2002 had NW regulations over and above the part or species recognized under the FSA
- Substantial variation in classification system and accompanying regulation
 - e.g., California's B list (Eradication or containment at the discretion of the State's Commissioner) versus Washington's B list (...at the local level)

Research Questions

- Why do state NW lists have limited overlap?
- Why do state NWS requirements or lists (recognized by the FSA) have limited overlap?
- What factors determine the size and composition of state NW lists (regulations)? Is agricultural commodity or seed producer (economic) protection a determining factor?
- Focus first on NWS given the common classification system across states

Theoretical set-up

- Multidisciplinary approach: Political economic and ecological factors.
- Government's objective function with
 - Seed Producers: price-enhancement and agronomic protection effects.
 - $\omega_s \pi(p_s(L), W_s, L, G)$
 - Commodity producers: input price increase versus agronomic protection effect.
 - $\omega_m \pi(p_m(L), p_s(L), W_m, L, G)$
 - Consumer interests: price versus eco-system preference effect
 - $\omega_c V(p(L), Y, L, I)$

Solution to State Optimization Problem

- Number or percent overlap between state i 's and j 's NWS requirements or lists is related to
 - ecosystem dissimilarities
 - agronomic dissimilarities
 - political economic indicators
- Formally

$$L_{ij} = L_{ij} (I_{ij}, G_{ij}, R_{ic}, R_{im}, R_{jc}, R_{jc})$$

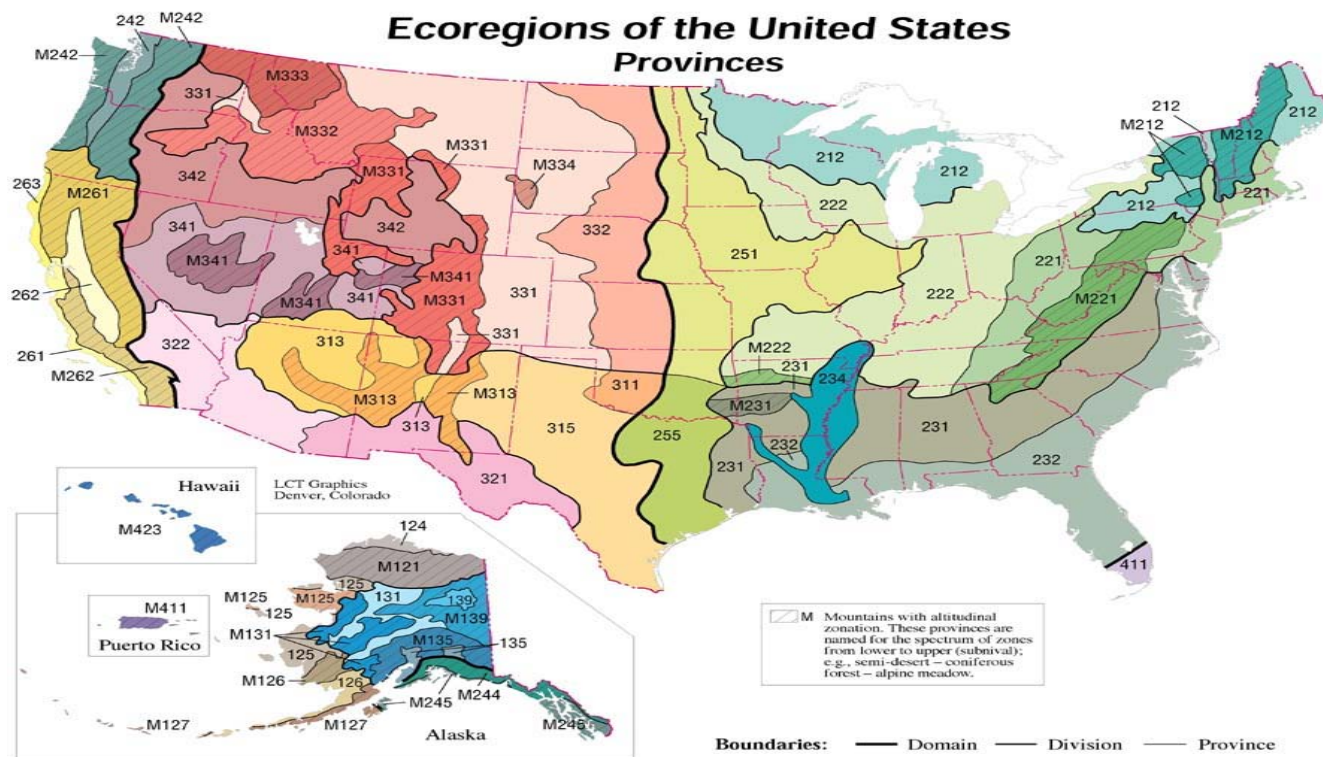
Data

- Construct NWS list overlap among 48 states (AK, HI excluded)
 - *Step 1*: Eliminating typos and duplications in the list.
 - *Step 2*: Solving the spp problem. That is, species compare with species and genus compare with genus.
 - *Step 3*: Substituting the synonym
 - *Step 4*: Comparing overlap

$$\begin{pmatrix} (AL \cap AL) / AL & \dots & (AL \cap WY) / AL \\ \vdots & \ddots & \vdots \\ (WY \cap AL) / WY & \dots & (WY \cap WY) / WY \end{pmatrix}$$

Data

- Ecology data based Bailey's Classification



Ecology Data (continued)

- 7 variables
 - Weighted average of temperature
 - Weighted average of precipitation
 - The variance of temperature
 - The variance of precipitation
 - Land or land share index (*NRI, USDA-NRCS*)
 - Water or water share index (*NRI, USDA-NRCS*)
 - Soil or soil share index
- Dissimilarity Index 48x48 matrix

$$\left(\begin{array}{ccc} |(AL - AL) / AL| & \dots & |(WY - AL) / AL| \\ \vdots & \ddots & \vdots \\ |(WY - AL) / WY| & \dots & |(WY - WY) / WY| \end{array} \right)$$

Agronomic Data

- Land Use
 - Irrigated land share of total crop land.
 - Seed crops share of total crop land.
 - Horticulture/Floriculture crops share of total crop land
 - Wheat, corn, and other field crops share of total crop land
- Dissimilarity Index – 48x48 matrix

Political Economy or Lobbying Data

- Dollar Amount or Number of Contributions
 - Agriculture share of total amount (number) of state contribution.
 - Seed Industries share of total amount (number) of state contribution.
 - Ideology (Environment) share of total amount (number) of state contribution.
 - Nursery/horticultural industry's data are available.

Empirical Analysis

- Econometric model: Options
 - OLS
 - Feasible GLS (groupwise heteroskedasticity)
 - Fixed or Random Effects (Hausman specification test)
 - Hausman-Taylor Estimator
- Functional Form
 - Linear, semi-log, double-log
- Choice of Variables
 - Share (e.g., land versus land share)
 - Dollar or number of contributions

Preliminary Results

- Expected results on ecological dissimilarity and NWS list overlaps.
 - Significant and negative coefficients on temperature, precipitation, land, water and soil dissimilarity indexes
 - Robust to changes in functional form, specification and estimator.
- Agronomic dissimilarity
 - Again, mostly negative coefficients, but insignificant in some specifications.

Preliminary Results

- Political economy variables
 - Dissimilarity indexes lack direction. Share of each group in state total is introduced as arguments
 - Seed producers' lobby effect
 - Positive, but insignificant in some specifications (agronomic protection and price-enhancement effects)
 - Commodity producers' lobby effect
 - Insignificant (input price increase likely offset by agronomic protection effect => net effect is zero)
 - Consumers' lobby effect
 - Negative and significant in most specifications (eco-system preference effect dominates price effect)

Conclusions and Implications

- Ecological and agronomic dissimilarities drive differences in NWS lists
- Lobbying, however, has a significant effect on NWS regulations
- Relative contribution is being assessed
 - Gap in overlap with and without lobbying will be computed
 - Implications for uniformity of NWS regulations
- Interstate trade effects will be estimated