Economic Risk Analysis: Oregon and the Japanese Beetle (*Popillia japonica*) Newman

Name: Japanese Beetle, *Popillia japonica* (Newman)
Origin, biology, hosts: Native to Japan, introduced into U.S. (New Jersey) in 1916; now in most eastern states; one generation per year; larvae feed on grass roots; adults feed on over 300 species of plants (e.g. roses, fruit trees, grapes, etc.)

RISK RATING SUMMARY
Relative Risk rating: **VERY HIGH**
Numerical Score: **9 (on a 1-9 scale)**
Uncertainty: **LOW**

RISK RATING DETAILS

- **Establishment Potential: HIGH**
  Oregon's climate and host plant distribution are ideal for Japanese beetle establishment.
- **Spread Potential: HIGH**
  Since its introduction in 1916 in New Jersey, Japanese beetle has become established in half of the 48 contiguous states. Nursery stock, commercial cargo airplanes, and long-haul trucks are major pathways of introduction.
- **Environmental Impact Potential: LOW**
  Many Japanese beetle hosts occur in Oregon's natural environment. Himalayan blackberry, a known favorite host plant, is abundant. Potential impacts to native species such as bigleaf maple, salmonberry, and native grasses are difficult to predict.
- **Economic Impact Potential: HIGH**
  Japanese beetle larvae feed on roots of grasses and are serious lawn and golf course pests. Adults feed on over 300 species of plants. Oregon has a number of susceptible hosts that are of economic significance (see Table):

Oregon Crop/Commodity	Acres Planted	Production Value in US $	Estimated Crop Damage Costs**	Estimated Quarantine Costs***	Total Economic Impact in US $
Nurseries	51,800	966,000,000	15,456,000	1,236,480	16,692,480
Pears (all varieties)	17,230	89,600,000	1,433,600	114,688	1,548,288
Grapes	15,600	60,200,000	963,200	77,056	1,040,256
Caneberries	10,960 *	54,100,000	865,600	69,248	934,848
Blueberries	3,640	53,000,000	848,000	67,840	915,840
Sweet cherries	14,100	47,900,000	766,400	61,312	827,712
Apples	4,990	29,700,000	475,200	38,016	513,216
Plums and prunes	1,500	2,900,000	46,400	3,712	50,112
Sweet corn/process	26,100	20,400,000	326,400	26,112	352,512
Snap beans/process	18,900	16,200,000	259,200	20,736	279,936
Grasses (turf)	544,155 *	466,900,000	7,470,400	597,632	8,068,032
Golf courses	35,000 ****	200,000,000 ****	3,200,000	Not Applicable	3,200,000
Total	**$ 743,975**	**$ 2,006,900,000**	**$ 32,110,400**	**$ 2,312,832**	**$ 34,423,232**

* acres harvested
** product of production value multiplied by .016 (damage estimate from Fowler et al. 2007)
*** product of estimated crop damage costs multiplied by .08 (estimated proportion for quarantine costs (Fowler et al. 2007))
**** estimate based on 4 million rounds @ $50/green fee (from Oregon Golf Association); estimated total for all OGA courses

TAKE HOME MESSAGE

If the Japanese beetle becomes established in Oregon and generally disperses throughout the state, the economic impact to all crops, commodities, and other related businesses could be over $34 million.

References

Fowler, G., L. Garrett, A. Neeley, D. Borchert, and B. Spears. 2007. Economic Analysis: Risk to U.S. Apple, Grape, Orange and Pear Production from the Light Brown Apple Moth, Epiphyas postvittana (Walker). USDA-APHIS-PPQ-CPHSt-PERAL Raleigh, NC.
Oregon Agripedia. 2007. Oregon Department of Agriculture, Salem, OR.