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

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)

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 beetles have 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, but could be significant.
- **Economic Impact Potential: HIGH**
  Oregon has a number of susceptible hosts that are of economic significance (see Table):

Oregon Crop/Commodity	Bearing or Harvested Acreage	Production Value	Estimated Crop Damage Costs[a]	Estimated Quarantine Costs	Total Economic Impact
Nurseries (B & B, Container, Greenhouse)	61,099[b]	805,000,000[b]	12,880,000	3,477,600[f]	16,357,600
Grapes	19,000	118,320,000	1,893,120	151,450[g]	2,044,570
Hops	5,410	35,679,000	570,864	45,669[g]	616,533
Cannabis	?	361,000,000[d]	5,776,000	Not Applicable	5,776,000
Caneberries	9,000	70,789,000	1,132,624	90,610[g]	1,223,234
Blueberries	9,000	102,325,000	1,637,200	130,976[g]	1,768,176
Pears (all varieties)	14,400	127,392,000	2,038,272	163,062[g]	2,201,334
Sweet cherries	12,500	82,709,000	1,323,344	105,867[g]	1,429,211
Apples	5,100	43,269,000	692,304	55,384[g]	747,688
Snap beans/process	8,500	13,940,000	223,040	17,843[g]	240,883
Grasses (turf)	418,550	449,018,000	7,184,288	574,743[g]	7,759,031
Golf Courses	8,550[c]	336,400,000[e]	5,382,400	Not Applicable	5,382,400
Total	**571,109**	**2,545,841,000**	**34,957,456**	**4,813,204**	**45,546,660**

[a] product of production value multiplied by .016 (damage estimate from Fowler et al. 2007)
[b] OAN 2016
[c] based on 190 golf courses in OR and average of 45 acres of grass planted per 18-hole golf course
[d] 2014 reported 150,628 pounds Oregon internal market, sold at average of $150/ounce
[e] The Oregon Golf Economy Full Report 2013
[f] product of estimated crop damage costs multiplied by .27 (estimated proportion of products that would be quarantined based on destination–western states and Canada)
[g] product of estimated crop damage costs multiplied by .08 (estimated proportion for quarantine costs (Fowler et al. 2007))

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 approximately $45.5 million.

References

Crownover, M. How many acres are needed for an 18 hole golf course? Golfsmith. Demand Media.
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.
Mortenson, E. 2015. OSU expert says skilled farmers would swamp pot market. Capitol Press.
Oregon Agripedia. 2015 edition. Oregon Department of Agriculture, Salem, OR.
Oregon Association of Nurseries. 2016. 2014 Oregon Nursery & Greenhouse Statistics.
The Oregon Golf Economy Full Report. 2013. Golf Alliance of Oregon Golf 20/20.