Circumstances are right for weed invasion to escalate, researchers say

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Few agribusinesses or governments regulate the types of plants that farmers use in their pastures to feed their livestock, according to an international team of researchers that includes one plant scientist from Virginia Tech.

The problem is most of these so-called pasture plants are invasive weeds.

In a *Proceedings of the National Academy of Sciences* study this month, the scientists recommended tighter regulations, including a fee for damage to surrounding areas, evaluation of weed risk to the environment, a list of prohibited species based on this risk, and closer monitoring and control of natural area damage.

The findings were also highlighted Nov. 12 in *Nature*.

The research team—led by scientists at the Australian National University—surveyed agribusinesses in eight countries on six different continents to see what species are planted in pastures, what traits are selected for, and what measures are taken to guard against invasion.

In response to human population boom and increased global food demand, some farmers resort to planting aggressive, fast-growing species in order to increase their herd size without breaking the bank.

This extensive growth allows for greater cattle forage, but has a long global history of escaping the paddocks and invading natural areas,

where they squelch out biodiversity, suck up available water resources, enhance fire cycles, disrupt the behavior patterns of pollinators, and alter nutrient and trophic levels.

In turn, about $34 billion per year is spent annually in the United States on invasive weed management, said Jacob Barney, an assistant professor of plant pathology, physiology, and weed science in the College of Agriculture and Life Sciences, Fralin Life Science Institute affiliate, and third author of the study.

"Meat consumption is increasing globally, which will increase animal production, and thus increase demand for forages improved for forage quality, productivity, and tolerance of poor growing conditions—all traits that may facilitate invasion into the natural ecosystem, making the invasion problem worse," said Barney, who is also a core faculty member in Virginia Tech's Interfaces of Global Change program.

"The weed problem faced by the USA and other countries is already enormous," said Don Driscoll, an associate professor at the Australian National University and lead author. "It makes sense to have new regulations that discourage agribusinesses from releasing more aggressive varieties of these existing weeds. A polluter-pays system applied across the livestock and feed industry would be an important disincentive that could help to solve this escalating weed problem."

Provided by Virginia Tech