Year: 2015

We lack evidence to call Jatropha invasive

Negussie, Aklilu and Norgrove, Lindsey and Achten, Wouter and Muys, Bart

Originally published as:

Negussie, Aklilu and Norgrove, Lindsey and Achten, Wouter and Muys, Bart. (2015) *We lack evidence to call Jatropha invasive.* Biofuels, bioproducts & biorefining, Vol. 9, H. 2. S. 123-124.

Commentary: We lack evidence to call *Jatropha* invasive

Aklilu Negussie[1], Lindsey Norgrove[2], Wouter M. J. Achten[3] and Bart Muys[4]

[1]ICRAF, Addis Ababa, Ethiopia. aklilumekuria@gmail.com

[2]Department of Environmental Sciences (Biogeography), University of Basel, St Johanns Vorstadt 10, CH-4056, Basel, Switzerland. lindsey.norgrove@unibas.ch

[3]Institute for Environmental Management and Land-Use Planning (IGEAT), Université Libre de Bruxelles, (CP 130 / 02), Av. F. D. Roosevelt, 50, B-1050 Brussels, Belgium. wouter.achten@ulb.ac.be

[4]Division Forest, Nature & Landscape KU Leuven, Celestijnenlaan 200E, Box 2411, 3001 Leuven, Belgium, bart.muys@ees.kuleuven.be

Biofuel crops are being increasingly promoted as an economic way to satisfy energy needs, while concurrently reducing greenhouse gas emissions. However, some studies have highlighted the risk of invasiveness of the involved crop species and consequent environmental damage. *Jatropha curcas* L. has some potential to improve rural livelihoods in tropical developing countries, if such risks could be minimized. Yet *J. curcas* has been listed as "potential invader" or even "highly invasive" in several publications.[1,2] For this reason, some countries such as South Africa and Australia took legal measures not to further domesticate Jatropha. However, subsequent critical analysis of the literature, considering Jatropha's functional traits and the circumstantial factors which might contribute to invasive behavior [3], plus a series of *in situ* field observations and experiments in Zambia and Burkina Faso [4,5], failed to find convincing, empirical evidence that *J. curcas* is invasive. Yet, more recent papers [6,7] seem to have missed these latest advances and continue to consider the species as highly invasive relying on mere applications of Weed Risk Assessment (WRA) tools (e.g., [8-10]). Problematic is that none of these sources used field data. Scientists within the invasive species community are beginning to question the undifferentiated use of WRA tools, partly because of the low data quality they rely upon and also because of the lack of context they are able to integrate into the decision making process. Negussie et al. (2013a)[3] proposed feasible practical recommendations for the selection, introduction, cultivation and processing steps of Jatropha and other biofuel crops to minimize invasiveness risk. Yokomizo et al. (2012) [11] outlined the use of cost benefit analysis addressing uncertainty, in deciding whether, or not, to introduce a particular species so decisions would depend upon the anticipated economic benefit of that plant in combination with the likely cost of controlling a potential outbreak. In the current climate, with an urgent need for sustainable intensification of food and energy production at the forefront, this seems a more sensible approach.

Acknowledgements

L. Norgrove is supported by the SNSF (Swiss National Science Foundation) through a Marie Heim-Vögtlin research fellowship.

References

1. Crosti R, Cascone C, Cipollaro S, Use of a weed risk assessment for the Mediterranean region of Central Italy to prevent loss of functionality and biodiversity in agro-ecosystems. Biol Invasions 12:1607-1616 (2010).
2. Gordon DR, Tancig KJ, Onderdonk DA, Gantz CA, Assessing the invasive potential of biofuel species proposed for Florida and the United States using the Australian weed risk assessment. Biomass Bioenergy 35:74-79 (2011).
3. Negussie A, Achten WMJ, Norgrove L, Hermy M, Muys B, Invasiveness risk of biofuel crops using *Jatropha curcas* L. as a model species. Biofuel, Bioprod Biorefin 7:485-498 (2013a).
4. Negussie A, Achten WMJ, Aerts R, Norgrove L, Sinkala T, Hermy M, Muys B, Invasiveness risk of the tropical biofuel crop *Jatropha curcas* L. into adjacent land use systems: from the rumors to the experimental facts. Global Change Bioenergy 5:419-430 (2013b).
5. Negussie A, Nacro S, Achten WMJ, Norgrove L, Kenis M, Hadgu KM, Aynekulu E, Hermy M, Muys B, Insufficient evidence of *Jatropha curcas* L. invasiveness: experimental observations in Burkina Faso, West Africa. Bioenergy Res. doi 10.1007/s12155-014-9544-3
6. Quinn LD, Gordon DR, Glaser A, Lieurance D, Flory SL, Bioenergy feedstocks at low risk for invasion in the USA: a “White List” approach. Bioenergy Res. doi 10.1007/s12155-014-9503-z
7. Lewis KC, Porter RD, Global approaches to addressing biofuel-related invasive species risks and incorporation into US laws and policies. Ecol Monographs 84(2):171-201 (2014).
8. Buddenhagen CE, Chimera C, Clifford P, Assessing biofuel crop invasiveness: a case study. PLoS ONE 4:e5261 (2009).
9. Daehler CC, Denslow JS, Ansari S, Kuo HC, A risk-assessment system for screening out invasive pest plants from Hawaii and other pacific islands. Conserv Biol 18:360-368 (2004).
10. Randall R, Lonsdale WM, Cooke D, Australian dataset, Pacific Island ecosystems at risk. Available at: http://www.hear.org/Pier/wra.htm (2013).
11. Yokomizo H, Possingham H P, Hulme PE, Grice AC, Buckley YM, Cost-benefit analysis for intentional plant introductions under uncertainty. Biol Invasions 14(4):839-84 (2012).