

ZERO WASTE ALLIANCE IRELAND

Towards Sustainable Resource Management



Feedback to the European Commission on the Revision of the Plant and Forest Reproductive Material Legislation

INTRODUCTION

Zero Waste Alliance Ireland supports the intention of the EU Commission to revise the Plant and Forest Reproductive Material Legislation. Changes must be made to the existing legislation to bring them in line with the EU Green Deal, Farm to Fork Strategy, the Biodiversity Strategy, EU Adaptation Strategy, and the new EU Forest Strategy.

A single, integrated, cohesive legislation on plant and forest reproductive material should streamline the certification process for new hybrids, heirloom and landrace varieties of crops and trees. This should help prevent the wasteful loss of valuable genetic resources.

We support changes to the certification process for conservation and amateur varieties. Often the priorities for these types of crops and trees are not simply high productivity and uniformity. Conservation varieties in particular may prove useful in organic agriculture. They may also provide valuable genetic diversity to help combat future challenges such as land degradation, decreased fertiliser use, changing climates and pest and disease outbreaks

More efficient registration processes should encourage innovation in agriculture and forestry, which may prove vital as we move forward into a changing global climate. Easier access to a wider range of crop and tree varieties should help mitigate some detrimental effects of climate change induced land degradation in the future. We agree that the harmonisation of the legislation should help the implementation of a sustainable agroecological system across the EU and establish a level playing field for marketing and innovation of crop and forest reproductive material.

Food security is a key target of the UN Sustainable Development Goals (SDGs). Current projections for “business-as-usual” farming under climate change suggest increasing food security challenges by 2050. The worst hit will be underdeveloped economic regions of the world where food security is already an issue and populations are vulnerable¹. Climate change mitigation strategies such as afforestation and bioenergy production risks reducing total land area available for food production. This in turn may impact food security, especially in low-income countries². Therefore, finding and developing crop and tree varieties that can cope with climate-induced stress while maintaining high yields is vital.

Additionally, the employment of heirloom and hybrid crops in organic systems may prove useful due to the lower fertiliser applications and increased crop vulnerability to pests and disease.

Agriculture

Since the 70s, heirloom varieties of crops have been lost, partly due to stringent EEC and EU laws designed to standardise seed quality, (Preston *et al.* 2011, pg 157)³. **ZWAI** is fundamentally opposed to the **waste of these genetic resources**. The legislation aimed to ensure distinctness, uniformity, and stability. However, by their nature, heirloom varieties tend to not display uniformity. Indeed, this can be seen as one of their advantages. The high genetic diversity of some heirloom varieties translates into a range of phenotypes in the field. This diversity is a valuable resource that should be preserved for the future. Useful traits may yet lie undiscovered in heirloom varieties that could be bred into conventional crops to prevent or nullify threats such as drought, heat stress, salinity stress, pests, disease, low soil nutrients and climate change. An experiment by Wilker *et al.*, (2019)⁴ found that heirloom bean varieties were better at fixing nitrogen than conventional varieties in low-nitrogen field conditions. The paper concluded that heirloom genotypes represent a useful source of genetics to improve nitrogen fixation in modern bean breeding. In a different experiment, several traditional and heirloom sweet

¹ Rosegrant, M.W., Koo, J., Cenacchi, N., Ringler, C., Robertson, R.D., Fisher, M., Cox, C.M., Garrett, K., Perez, N.D. and Sabbagh, P., 2014. Food security in a world of natural resource scarcity: The role of agricultural technologies. Intl Food Policy Res Inst.

² Fujimori, S., Hasegawa, T., Krey, V., Riahi, K., Bertram, C., Bodirsky, B.L., Bosetti, V., Callen, J., Després, J., Doelman, J. and Drouet, L., 2019. A multi-model assessment of food security implications of climate change mitigation. Nature Sustainability, 2(5), pp.386-396.

³ Preston, J.M., Maxted, N., Sherman, R., Munro, N. and Ford-Lloyd, B.V., 2011. 21 What's in a Name: A Closer Look at Heritage Variety Definition. Agrobiodiversity Conservation Securing the Diversity of Crop Wild Relatives and Landraces, p.152.

⁴ Wilker, J., Navabi, A., Rajcan, I., Marsolais, F., Hill, B., Torkamaneh, D. and Pauls, K.P., 2019. Agronomic performance and nitrogen fixation of heirloom and conventional dry bean varieties under low-nitrogen field conditions. Frontiers in plant science, p.952.

potato cultivars exhibited significant levels of resistance to soil insect pests, compared to conventional, insect-susceptible control cultivars.⁵

Drought and salinity can reduce potential barley yields by 20–50%.⁶ Drought and land degradation is likely to increase because of climate change⁷. Kumar *et al.*, (2020)⁸ recommend the use of landrace barley varieties as a source of abiotic stress resistance genes. They suggest landrace varieties be used in breeding programs to produce high-yielding hybrids with innate stress resistance. High costs are currently associated with registering crop and tree varieties in the EU. For some heirloom varieties, which may have a small potential market, the costs are prohibitively high.

Forestry

The proposed changes to the Plant and Forest Reproductive Material legislation should support the establishment of multi-species forestry plantations in the EU. This will help achieve the goals of the EU green deal, particularly the sustainable industry and biodiversity goals. Action on this front is demanded by European NGOs including Fern, Friends of the Irish Environment, Rewilding Europe and Forest Movement Europe. Monoculture plantations take up vast tracts of land in the EU. 33% of European forests are composed of monoculture stands⁹; roughly 52 million hectares. This type of land-use is **highly wasteful** since the opportunities for valuable ecosystem services are missed. Easier access to a wider range of tree species for plantations through the proposed legislation change should facilitate the establishment of more diverse plantations. These mixed plantations can provide enhanced ecosystem goods and services including biodiversity, soil health management, water and nutrient recycling, and recreational value. A study by Huuskonen *et al.*, (2021)¹⁰ concluded that mixed plantations have better resilience against drought. Additionally, mixed plantations may provide better resilience against pests and disease. Concern is being raised currently about the risk of pest damage to the extensive monoculture plantations in Europe. Spruce, especially, is susceptible

⁵ Jackson, D.M. and Harrison Jr, H.F., 2013. Insect resistance in traditional and heirloom sweetpotato varieties. *Journal of economic entomology*, 106(3), pp.1456-1462.

⁶ Shrivastava, P. and Kumar, R., 2015. Soil salinity: A serious environmental issue and plant growth promoting bacteria as one of the tools for its alleviation. *Saudi journal of biological sciences*, 22(2), pp.123-131.

⁷ Reed, M.S. and Stringer, L.C., 2016. *Land degradation, desertification and climate change: Anticipating, assessing and adapting to future change*. Routledge.

⁸ Kumar, A., Verma, R.P.S., Singh, A., Sharma, H.K. and Devi, G., 2020. Barley landraces: Ecological heritage for edaphic stress adaptations and sustainable production. *Environmental and Sustainability Indicators*, 6, p.100035.

⁹ State of Europe's Forests 2020, FOREST EUROPE, https://foresteurope.org/wp-content/uploads/2016/08/SoEF_2020.pdf (Accessed March 2022)

¹⁰ Huuskonen, S., Domisch, T., Finér, L., Hantula, J., Hynynen, J., Matala, J., Miina, J., Neuvonen, S., Nevalainen, S., Niemistö, P. and Nikula, A., 2021. What is the potential for replacing monocultures with mixed-species stands to enhance ecosystem services in boreal forests in Fennoscandia?. *Forest ecology and management*, 479, p.118558.

to serious pests including the European spruce bark beetle (*Heterobasidion* spp). These pests are likely to spread more in the future, partly due to climate change ¹¹. Additionally, mixed tree plantations may offer greater lumber production than monocultures, especially in South and Central Europe, ¹². Thus, the transition from monoculture to mixed-species plantations, coupled with increased total area under forestry will help mitigate climate change, provide enhanced ecosystem services, render forests more resilient to climate change-induced stresses and minimise wasteful monoculture land use. More efficient registration, certification, and marketing of forest reproductive material may help support the widespread adoption of Agroforestry in the EU. Agroforestry is a useful agro-ecological strategy, allowing agricultural systems to provide ecosystem services in addition to conventional products ¹³.

¹¹ Netherer, S. and Nopp-Mayr, U., 2005. Predisposition assessment systems (PAS) as supportive tools in forest management—rating of site and stand-related hazards of bark beetle infestation in the High Tatra Mountains as an example for system application and verification. *Forest Ecology and Management*, 207(1-2), pp.99-107.

¹² Gamfeldt, L., Snäll, T., Bagchi, R., Jonsson, M., Gustafsson, L., Kjellander, P., Ruiz-Jaen, M.C., Fröberg, M., Stendahl, J., Philipson, C.D. and Mikusiński, G., 2013. Higher levels of multiple ecosystem services are found in forests with more tree species. *Nature communications*, 4(1), pp.1-8.

¹³ Torralba, M., Fagerholm, N., Burgess, P.J., Moreno, G. and Plieninger, T., 2016. Do European agroforestry systems enhance biodiversity and ecosystem services? A meta-analysis. *Agriculture, ecosystems & environment*, 230, pp.150-161.