

2024-08-02

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CABI

<https://doi.org/10.1079/planthealthcases.2024.0009>

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Experimental *Prosopis juliflora* Management Practices and Grassland Restoration in Three Eastern African Countries

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Abstract

Prosopis juliflora, a native tree species of Central and northern South America, was introduced in degraded habitats in Eastern Africa as a wind break, and as a source of fodder, fuel, and timber. *P. juliflora* has a high drought tolerance and has become a highly invasive tree or shrub, spreading rapidly, and transforming socio-economic systems. It negatively impacts livelihoods in many ways, including reduced income in pastoralist-dominated regions once coverage is above a certain invasion level. Management of *P. juliflora* is needed to restore ecosystem services, such as biodiverse grassland that provides fodder and sequesters carbon. In order to investigate which are the most effective and economically efficient management practices, a 3-year study was conducted in Ethiopia, Kenya, and Tanzania, three countries with savanna and grassland that have been invaded by *P. juliflora*. The management treatments being tested were: manual uprooting; cutting the stumps and applying herbicide; and basal bark herbicide treatment. Alongside these treatments, restoration interventions aimed at restoring natural vegetation were also tested, and these were: creating divots; creating divots + mulching with hay; and creating divots + mulching with hay + grass seed sowing. The control methods were all highly effective in killing *P. juliflora*, with methods to remove all above-ground biomass (manual and cut stump) resulting in a more productive and diverse surrounding vegetation than the basal bark herbicide treatment. The effect of the restoration interventions on vegetation composition was small, suggesting that species were re-established mostly from the soil seed bank. This case presents some of the methods and results of the study.