

ROLE OF DISTURBANCE REGIMES IN PLANT INVASION AND COMMUNITY CHANGE. Robert A. Masters, Rangeland Scientist and Product Technology Specialist, Dow AgroSciences, LLC, Lincoln, NE 68516.

A critical step in the invasion process is plant propagule dispersal into locations or microsites that provide conditions conducive to plant establishment. These locations where immigrant plants establish and develop are often referred to as safe sites, regeneration niches, or invasion windows. These safe sites must meet the requirements of the alien species for germination, growth, and development and enable the plant to reach reproductive maturity. Disturbance is often a driving force that facilitates creation of safe sites for invasive plant establishment. Disturbance is defined as any discrete event in time that disrupts ecosystem, community, or population structure, and changes resources, substrate availability, or the physical environment. Events that affect resource availability and community demographic processes such as fire, storms, floods, grazing management, and fertilization are considered disturbances. Disturbances associated with global change (global warming, increasing atmospheric CO₂, increasing nitrogen deposition, etc.) influence distributions of invasive plants. Disturbance is an important factor affecting community structure and dynamics that promotes invasion by exotic plant species, especially where disturbance disrupts species interactions and reduces competition and/or interference. Invasion success is dependent on the extent and type of disturbance, propagule pressure (number of alien plant propagules in the community and duration of community exposure to propagules) and time interval between disturbance events. Community susceptibility to invasion is increased when disturbances deviate from historical patterns because the resident species are likely not adapted to the new disturbance regime and species composition will shift to favor those beneficially affected by the disturbance. Developing effective and sustainable programs to manage invasive plants requires an understanding of plant community response to disturbance and manipulating disturbance regimes to favor desired species and successional trajectory.

