From Forest Nursery Notes, Winter 2010

38. © Response of two perennial herbaceous Texas legumes to shade. Muir, J. P., Bow, J. R., and Boggs, L. L. Native Plants Journal 10(3):252-261. 2009.

Response of two perennial herbaceous Texas legumes to shade

James P Muir, John R Bow, and Lisa L Boggs

ABSTRACT

Very few perennial herbaceous legumes have been developed for native seed mixes in the southern Great Plains, and none are specifically sold for forest understory reseeding. This study looked at shade tolerance of tropical puff (*Neptunia pubescens* Benth. var. *microcarpa* (Rose) Windler [Fabaceae]) and dollar snout-bean (*Rhynchosia americana* (Houst. ex Mill.) M.C. Metz [Fabaceae]) over 3 growing seasons. Pod production declined ($P = 0.001$) only at 80% shade and dollar snout-bean branch length and herbage production increased ($P < 0.08$) at moderate shade levels compared with open sunlight and in contrast to tropical puff that showed no positive responses to shade. Neutral detergent fiber and acid detergent fiber increased ($P = 0.001$) at 80% shade while acid detergent lignin decreased ($P = 0.02$) under shade except for dollar snout-bean at high levels of shade. Nitrogen and carbon concentrations increased ($P = 0.10$) under shade for both species but carbon decreased ($P = 0.10$) at 80% shade in the snout-bean. Both species should be useful for inclusion in seed mixes under tree and brush canopies because they tolerate and even thrive under moderate shade. Tropical puff shows greater potential for nutritive value for ruminant nutrition due to lower fiber and greater nitrogen concentrations compared with the snout-bean.

Muir JP, Bow JR, Boggs LL. 2009. Response of two perennial herbaceous Texas legumes to shade. Native Plants Journal 10(3):252–261.

KEY WORDS

herbage yield, herbage nutritive value, *Neptunia pubescens* var. *microcarpa*, nutritive value, *Rhynchosia americana*, shade

NOMENCLATURE

USDA NRCS (2008)

Neptunia pubescens pods by James P Muir

Including a greater number of native forb species in woodland restoration or grassland rehabilitation seed mixes for the southern Great Plains may enhance diversity, productivity, and long-term stability of the resultant grasslands (Tillman and others 2006). The inclusion of herbaceous perennial legume species into these ecosystems could increase crude protein (CP), energy, and minerals in native and domesticated animal diets through greater herbage and seed availability (Muir and others 2005). In addition, introduction of legumes as a wildlife management tool may be an efficient and effective technique for improving wildlife habitat, increasing carrying capacity, and enhancing reproductive efficiency.

The essential role of native perennial herbaceous legumes in high-diversity woodland ecosystems has been well documented. These encompass forage for native and domestic ruminants, nutrient recycling and sequestration, reduction in soil nutrient leaching losses, stimulation of greater soil faunal activities, reduction in soil erosion, improved soil fertility, and sustained levels of crop production (Kang 1997; Turner and