

Table 1. Species frequently used in greenstrips.

Common name	Scientific name
crested wheatgrass	<i>Agropyron cristatum</i> J. Gaertner, and <i>A. desertorum</i> (Fischer ex Link) Schultes
Siberian wheatgrass	<i>A. fragile</i> (Roth) Candargy
forage kochia	<i>Kochia prostrata</i> (L.) Schrad.
western yarrow	<i>Achillea millefolium</i> L. ssp <i>lanulosa</i> (Nutt.) Piper
sandberg bluegrass	<i>Poa secunda</i> L. Presl
small burnet	<i>Sanguisorba minor</i> Scop.
Alfalfa	<i>Medicago sativa</i> L.
blue flax	<i>Linum perenne</i> L.
bottlebrush squirreltail	<i>Elymus elymoides</i> (Raf.) Swezey
bluebunch wheatgrass	<i>Pseudoroegneria spicata</i> (Purch) A. Love
Asian beardless wildrye	<i>Leymus multicaulis</i> (Kar. & Kir.) Tzvelev

Forage Kochia Suited For Greenstripping

Monsen (1994) described the following characteristics as important when selecting species for greenstripping on semiarid rangelands: 1) adaptability to the range sites, 2) competitiveness with annual weeds, 3) ease of establishment, 4) low flammability, 5) open canopy and spacing, 6) palatability by livestock and wildlife (for efficient removal and control of litter and fine fuel buildup), and 7) resilience and regrowth capabilities. Species most frequently used in greenstripping programs are shown in Table 1.

While many species have characteristics that meet some of the desired criteria, forage kochia demonstrates most if not all the desired greenstripping qualities.

Scientists and range managers consider 'Immigrant' forage kochia a prime candidate for use on western rangelands for fire prevention and range rehabilitation. However, there

is need to evaluate additional germplasm of forage kochia for its compatibility for greenstripping and other rangeland uses. Consequently, a forage kochia breeding program was initiated in 1998 at the USDA-ARS, Forage and Range Research Lab in Logan, Utah to meet the needs of Western rangelands and greenstripping programs.

Some are concerned that forage kochia will invade and suppress or eliminate native plant communities. Harrison et al. (2000) found that 'Immigrant' forage kochia may spread into disturbed and bare areas stabilizing the soil; however, there is little evidence that it is an aggressive spreader or that it will negatively impact established perennial plant communities.

In Idaho, it has been reported to encroach into alkali slick spot soils where some sensitive species may exist (Harrison et al. 2000). However, because greenstrips are frequently established in cheatgrass dominated areas to suppress large rangeland fires, the benefits of fuel reduction outweigh potential negative impacts caused by minimal spread of forage kochia. Clements et al. (1997) and Gray (personal communication, Wildlife Biologist) found that cheatgrass declined and native species numbers increased in 'Immigrant' forage kochia seedings in Nevada.

Thus, the concept has been developed that placing greenstrips at strategic locations breaks up the cheatgrass fire cycle and facilitates the return of native species to cheatgrass dominated sites.

Does Forage Kochia Stop Fires?

Pellant observed that two of the most important determinants of successful greenstrips are disrupting fuel continuity and increasing plant moisture content during the fire season. As a half shrub, forage kochia competes with and replaces cheatgrass, and maintains a high mois-



Ten-year old Immigrant forage kochia greenstrip bordering cheatgrass at Whiterock research plots near Skull Valley, Utah.



Border of twelve-year old Immigrant forage kochia and crested wheatgrass greenstrip planting near Mountain Home, Idaho.