The rainfed crop-production system in western Nebraska is dominated by the traditional wheat-fallow crop rotation. Replacing fallow in traditional crop rotations is imperative for sustainability. Proso millet is the best alternative crop and field pea is the emerging new alternative crop. This presentation will cover current progress of proso millet breeding and genomics, development of grain legume crops such as field pea and fenugreek, and oil seed crops like winter canola.