Challenges for Rainfed Alfalfa Production in the Loess Plateau Area in the Southern Ningxia Hui Autonomous Region, People's Republic of China (PRC)

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The Loess Plateau in northwest China is a very fragile ecosystem where transhumant grazing and dryland farming have been practiced for many centuries. During recent population growth, annual cropping and overgrazing have resulted in serious erosion problems in the Yellow River basin. Since 1990, large reclamation projects have been initiated to develop terraces with mass plantings of trees and perennial vegetation to reduce erosion. The southern area of the Ningxia Hui Autonomous Region consists of about 2.4 million people, 75% of which are farmers, and is one of the poorest regions in China. The precipitation ranges from 300 to 500 mm, and the traditional crops grown are wheat, buckwheat, millet, corn, potato and other vegetable crops. In the early 2000's, open grazing was severely restricted on China's grasslands, and widespread plantings of alfalfa were installed to feed confined livestock. While alfalfa has been grown in this region for over 2000 years, most farmers are unfamiliar with proper alfalfa crop management, and there have been many other challenges.

From 2007-2009, the authors participated in a project to build and sustain alfalfa production in Ningxia sponsored by the UN Food and Agriculture Organization. Detailed surveys were conducted of 96 farmers to assess their demographics and needs. In early summer of 2008 and 2009, training of trainers (TOT) was delivered in an intensive course to 51 technicians and Extension staff. Subsequently, 258 farmers participated in half-day farmer field schools (FFS) that were held weekly throughout the growing season. A participatory learning process was used in all classroom and field exercises, and pre- and post-training evaluations were obtained for both TOT and FFS participants. The major outputs were a training manual, a website and staff training in alfalfa agronomy and pest management. In addition, several on-farm tests to demonstrate alfalfa varieties, fertilizer treatment, and use of nurse crops were installed.

During the three-year project, we observed: 1) high alfalfa prices in China during the period (>$350 per MT) increased demand for the training, 2) alfalfa stands planted in 2001- 2003 are simultaneously dying, 3) there is a significant need to adapt small machinery to improve harvest efficiency, 4) integrated pest management (IPM) strategies are required, 5) more training is needed for integrating alfalfa with other crops in planned rotations, 6) the participatory learning procedure was deemed very effective in both TOT and FFS, and 7) research expertise is available in areas such as variety testing, disease and pest monitoring and pest control in Ningxia, however more support is needed for Extension delivery to village farmers.