Managing Forage-Livestock Systems in a Changing Climate

Growing demand for animal products worldwide combined with an increasingly variable climate will require more resilient and productive forage–livestock systems. A major challenge will be to achieve greater resilience using simple, affordable strategies that producers will adopt.

An article recently published in Crop Science synthesizes findings from the 2017 Forage and Grazinglands Division Symposium, which was titled “Resilience in Forage and Grazinglands.” The symposium brought together forage–livestock specialists from all across the United States.

The following strategies were suggested as ways to improve resilience: (1) identify moderately diverse, site-specific mixtures (grasses–legumes) for regional use; (2) use more complementary forage species such as C₃ and C₄ grasses; (3) adopt moderate defoliation intensities to help stabilize forage production, (4) give more attention to improving soil fertility, and (5) increase adoption of land assessment tools.

Managing for greater resiliency in forage–livestock systems will be challenging because some strategies could require sacrificing short-term profitability (e.g., reducing stocking rate). While higher forage–livestock production is a worthy goal, it may be worth exploring whether this paradigm should be shifted slightly to incorporate ways to build greater resilience into our forage–livestock systems.

Identifying High-Yielding and Stable Maize Hybrids for the Highlands of Mexico

For Mexico to achieve self-sufficiency in maize production grain yield (GY) should increase to ~4.5 Mg ha⁻¹ after 2017. Approximately 3.0 million ha, or 20% of the overall area under maize, are in the highlands (1,800–3,000 m above mean sea level) of central Mexico. Of this, approximately 750,000 ha are under drip irrigation and optimal conditions, producing high grain yields. However, the average regional yield is less than 4.0 Mg ha⁻¹.

The main factor that limits grain yield in this region is the poor stability of native maize varieties across years and locations. Therefore, widespread use of improved varieties and hybrids is important to increase maize productivity and stability in the short term.

In an article recently published in Crop Science, authors describe a study comprising 16 maize hybrids evaluated in 37 highland Mexican locations. The results revealed some highly promising early maturing, high-yielding white maize hybrids.

The development of improved maize varieties in different agro-ecologies of Mexico requires collaboration. The Mexican government, through the Sustainable Modernization of Traditional Agriculture Program (MasAgro), has been actively funding work spearheaded by CIMMYT (International Maize and Wheat Improvement Center) to do this. The effort has also included the creation and operation of an extensive network of smallholder farmers, as well as small- and medium-enterprise seed companies throughout Mexico.

Adapted from Torres Flores, J.L., B.M. García, B.M. Prasanna, G. Alvarado, F.M. San Vicente, and J. Crossa. 2017. Grain yield and stability of white early maize hybrids in the Highland Valleys of Mexico. Crop Sci. 57:3002-3015. View the full open access article online at http://dx.doi.org/doi:10.2135/cropsci2017.03.0145

Forage–livestock systems may be exposed increasingly to extreme weather like this flooding event from 2015 in Oklahoma. Management strategies that promote greater resiliency in our forage–livestock systems should be a priority to help producers better cope with these challenges.

Adapted from Tracy, B.F., J.L. Foster, T.J. Butler, M.A. Islam, D. Toledo, and J.M.B. Vendramini. 2017. Resilience in forage and grazinglands. Crop Sci. 58. View the full article online at http://dx.doi.org/doi:10.2135/cropsci2017.05.0317

For typical maize lot of a small farmer in the highlands of Mexico. Photo by J. Crossa.