The Economics of Forage Crops in the Western U.S.

By Russell Tronstad¹ and Jay Parsons²

The theme for this Spring 2023 issue of the Western Economics Forum (WEF) is “The Economics of Forage Crops in the Western U.S.” Forage crops utilize more scarce land and irrigation water for most states in the West than any other crop. Yet information and research on everything from water utilized by forages to price analyses are scarcer than for other crops. Forage production systems vary greatly across the West and forage markets are inherently complex. The complexity is due to the many different intrinsic attributes desired by different demand sectors, ranging from milking dairy cows to the equine industry and beef cow sector. Furthermore, forage has a relatively high cost of shipping between regions, due to the bulky nature of the product relative to feed grains. Even though forage is bulky to ship, exports of alfalfa to other countries have grown quite remarkably since 1992, when they were essentially nothing. In 2021 and 2022, almost 20% of the alfalfa produced in the seven most Western states (Arizona, California, Idaho, Nevada, Oregon, Utah and Washington) was exported. These seven states account for virtually all U.S. alfalfa exports.

This special issue is comprised of six articles. In general, state-level alfalfa export data are not readily available. Furthermore, one of the criticisms of alfalfa exports is they are sourced from water-scarce states. In the first article, titled Alfalfa Export and Water Use Estimates for Individual States, Sall, Tronstad, and Chin quantify state-level alfalfa exports using port data (1994-2001) and Forage Products from U.S. trade online (2002-2022). Then, they calculate an estimate that only around 3-5% of the irrigation water applied in agriculture in the seven most western states is utilized for alfalfa exports.

Price reporting is another area of inconsistent or incomplete data for hay compared to other crops. Some of this is because there is no futures market for alfalfa hay. In the second article, Feuz and Larsen analyze 30 years (1992-2021) of annual real alfalfa prices across the seven most Western states and show that alfalfa prices in each state are highly correlated (range from 0.85 to 0.96) with the other six states, even though mean prices are significantly different. An explanatory model is also provided to derive alfalfa price forecasts for Extension clientele using traded futures contracts for corn, feeder cattle, and milk.

¹ University Distinguished Outreach Professor, Department of Agricultural & Resource Economics, University of Arizona
² Professor, Department of Agricultural Economics, University of Nebraska-Lincoln
The third article, by Hatzenbuehler et al., focuses on the state of Idaho, while presenting a method for quantifying state-level feed crop supply and demand on an annual basis. They follow procedures like those used to obtain World Agricultural Supply and Demand Estimates. Results for Idaho show that demand has exceeded supply for corn grain for the entire study period (2003-2021), while supply and demand are largely at parity for alfalfa hay, corn silage, and barley.

The fourth article takes an interesting look at the effect timing of the hay harvest has on hay quality. Using field trial data from Southern Utah, Sip et al. find that alfalfa harvested at 12pm compared to 8am increases Relative Feed Value by 7.3 points. Considering this higher feed value and price, simulation results indicate that gross revenues are $16.95/acre and $14.77/acre more for the first and second cuttings, respectively, from cutting alfalfa at 12pm compared to 8am.

Sall and Tronstad then provide a comprehensive overview of the alfalfa and other hay export markets, which have grown in both volume and value over the last thirty years. They show how the spread between monthly export and domestic prices has trended larger for other hay and alfalfa over the 1994-2022 period while the spread for corn and soybeans has been flat. This result is not surprising given that alfalfa exports have grown 13-fold over this period and hay is relatively bulky to move and transport compared to feed grains. China imported virtually no alfalfa from the U.S. in 2007, but they quickly grew to be our largest importer by 2014 and they have continued this growth such that they have accounted for over half of all U.S. alfalfa exports since 2021.

Finally, we close this issue with an article by Taylor, Ranaka, and Maczko analyzing federal grazing, an important forage resource in the Western U.S. Critiques of the federal grazing program have recently called for the complete elimination of livestock grazing on public lands. Taylor, Ranaka, and Maczko estimate the direct economic impact of removing all federal grazing of cattle in Idaho, Oregon and Wyoming, including changes in hay sales, would be an annual net loss of $186.2 million. Furthermore, they estimate a reduction of $560.5 million in total economic impact. These impacts equate to a loss of more than 4,000 jobs and decreased labor income of $205.4 million annually.

These represent a strong variety of articles while serving an important need for more information on the economics of forage crops in the Western U.S. We hope you enjoy the issue.