Agriculture in Graham and Greenlee Counties: An Economic Contribution Study

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Graham and Greenlee counties, in eastern Arizona, are largely rural counties with agricultural industries that include crop production along the Gila River and livestock grazing throughout the region’s remote and rugged public lands. The significance of agriculture in these counties’ economies is not limited to on-farm production. By purchasing inputs such as seed, fertilizer, feed crops, banking services, and hiring labor, a “ripple” of economic activity is created in other industries providing those goods and services. Additionally, households that derive income from agriculture contribute to the local economy by purchasing household goods and services. Economists call these indirect and induced multiplier effects.

This study provides a summary of current agricultural production in Graham and Greenlee counties in 2017, and conducts economic contribution analyses for each county to characterize and quantify economic activity attributable to agriculture. These economic contributions include the direct contributions of agriculture, such as sales of crops and livestock products and employment in agricultural industries, as well as the contributions supported through indirect and induced multiplier effects.

Finally, considering that availability of irrigation water is critical for crop production in this region, the study estimates reductions in crop acreage, on-farm sales, and economics impacts due to hypothetical reductions in irrigation water supplies for the Graham and Greenlee county economies.

What is the Issue?

What Did the Study Find?

Agriculture in Graham & Greenlee Counties

Graham County...

- Is a crop-dominant county by value of sales, with 88% of county agricultural cash receipts in 2017 from crop sales and 12% from livestock
- Had 448 farms in 2017, covering 43,056 acres of harvested cropland (98% irrigated) and 1,183,759 acres of pastureland (<1% irrigated)
- Generated $62.1 million in agricultural sales in 2017
- Top commodities by sales: cotton & cottonseed ($28.5 million); grains, oilseeds, dry beans, & dry peas ($14.2 million); cattle & calves ($6.8 million); nursery, greenhouse, floriculture, & sod (sales not disclosed), fruits, tree nuts, & berries (sales not disclosed)
- Encompasses part of the San Carlos Apache Reservation, with 198 total farms, most of which are beef cattle producers

Greenlee County...

- Is a livestock-dominant county by value of sales, with 75% of county agricultural cash receipts from livestock and 25% from crops in 2017
- Had 123 farms in 2017, covering 3,279 acres of cropland (100% irrigated) and 59,714 acres of pastureland (3% irrigated)
- Generated $8.7 million in agricultural sales in 2017
- Top commodities by sales: cattle & calves (sales not disclosed); other crops & hay ($1.9 million)

Source: 2017 Census of Agriculture
Economic Contributions were estimated using the IMPLAN 3.1 input-output data and software. The models were modified using data from the 2017 Census of Agriculture to more accurately reflect production practices and economic conditions in Graham and Greenlee counties in 2017. Contributions are reported by value of sales, value added, labor income, and the number of full- and part-time jobs supported. To examine potential regional economic effects of reduced crop production in Graham and Greenlee counties due to hypothetical reductions in irrigation water supplies, the study considers a 20% reduction in current irrigation water use in each county, assuming producers would respond by fallowing fields, resulting in reduced crop production. While potential economic impacts of less crop production would primarily be concentrated in agricultural industries, other industries could be affected through multiplier effects. For example, if inputs and workers are typically sourced locally, a reduction in crop acreage results in decreased economic activity in other sectors of the economy.

Fallowing scenarios, estimated sales reductions, and total economic impacts, including multiplier effects, are presented in the table to the right.

### Economic Impacts of Hypothetical 20% County Agricultural Water Supply Reduction

<table>
<thead>
<tr>
<th></th>
<th>Graham County</th>
<th>Greenlee County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual water supply reduction (AF)</td>
<td>27,436</td>
<td>2,550</td>
</tr>
<tr>
<td>Crop fallowed</td>
<td>Cotton</td>
<td>Alfalfa</td>
</tr>
<tr>
<td>AZ avg. water application rate (2018)</td>
<td>4.6 AF/acre</td>
<td>5.8 AF/acre</td>
</tr>
<tr>
<td>Estimated acreage fallowed</td>
<td>5,964</td>
<td>440</td>
</tr>
<tr>
<td>2017 acreage</td>
<td>26,179</td>
<td>2,396</td>
</tr>
<tr>
<td>Percentage of 2017 acreage fallowed</td>
<td>23%</td>
<td>18%</td>
</tr>
<tr>
<td>County yield (2017)</td>
<td>1,213 lb./acre</td>
<td>4.3 tons/acre</td>
</tr>
<tr>
<td>AZ avg. price (2017)</td>
<td>$0.73/lb.</td>
<td>$172/ton</td>
</tr>
<tr>
<td>Estimated sales reduction</td>
<td>$5.3 million</td>
<td>$323,000</td>
</tr>
</tbody>
</table>

#### How was the study conducted?

Economic contributions were estimated using the IMPLAN 3.1 input-output data and software. The models were modified using data from the 2017 Census of Agriculture to more accurately reflect production practices and economic conditions in Graham and Greenlee counties in 2017. Contributions are reported by value of sales, value added, labor income, and the number of full- and part-time jobs supported. To examine potential regional economic effects of reduced crop production in Graham and Greenlee counties due to hypothetical reductions in irrigation water supplies, the study considers a 20% reduction in current irrigation water supplies for each county: 27,436 AF in Graham County and 2,550 AF in Greenlee County. Crop budgets, water application rates, yields, and price data were used to identify crops for fallowing and estimate reductions in acreage and sales. Reductions in crop sales were modeled in IMPLAN to estimate resulting decreases in regional economic activity.