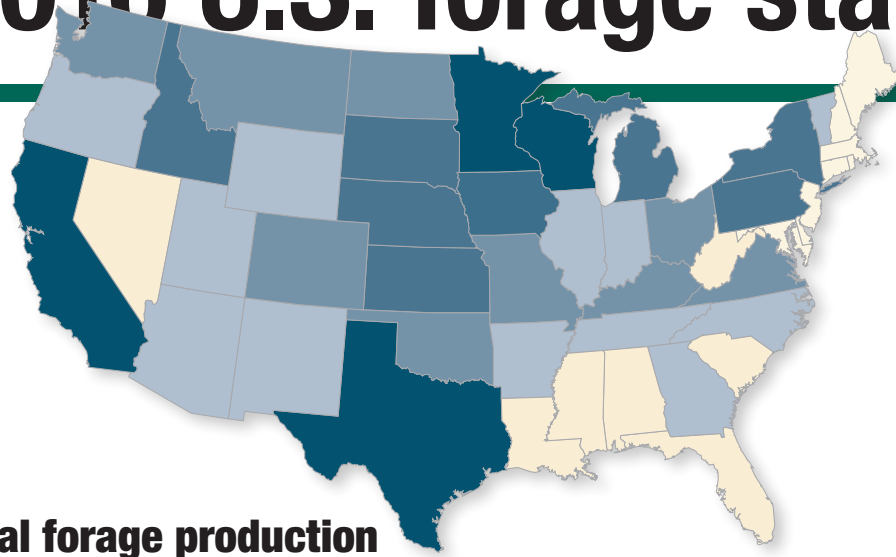
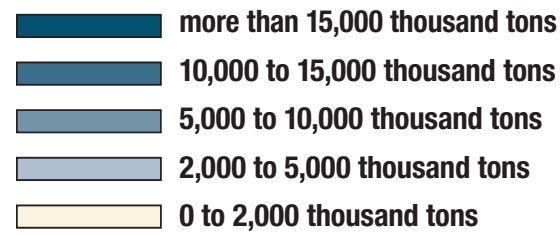


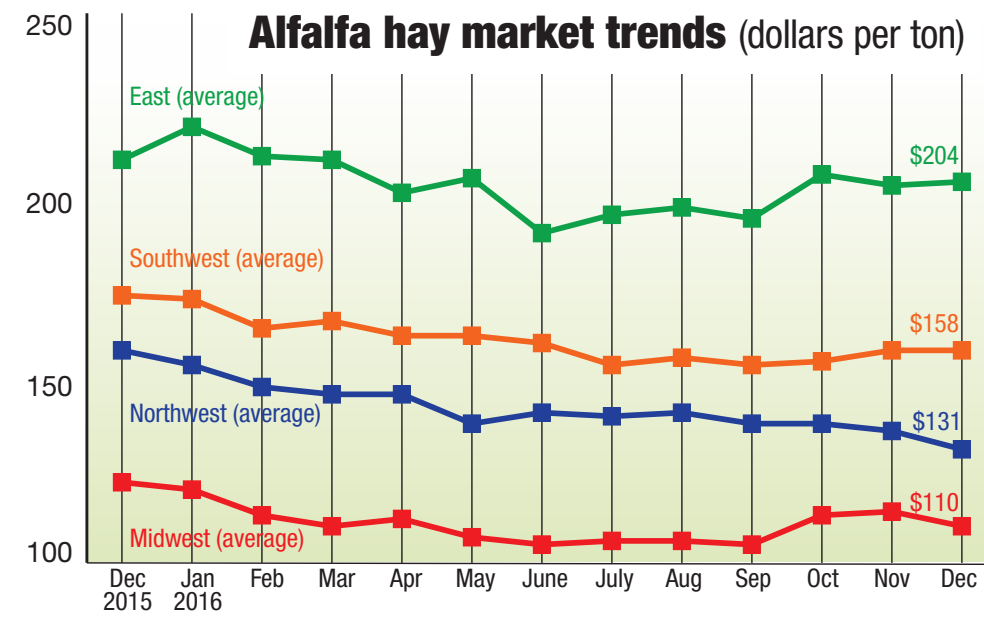
2016 U.S. forage statistics



Total forage production



Total forage production is represented by the total of alfalfa, other hay, silage and greenchop production.



States that provided data to NASS were divided into the following regions:

- Southwest: Arizona, California, Nevada, New Mexico, Oklahoma, Texas
- East: Kentucky, New York, Ohio, Pennsylvania
- Northwest: Colorado, Idaho, Montana, Oregon, Utah, Washington, Wyoming
- Midwest: Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin

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2016 national forage review



Weather and drought

U.S. hay-growing areas considered under drought fell to lows of 8 percent in March-June 2016, but then doubled in late summer and fall and doubled again to 32 percent by early December.

Thanks to widespread precipitation to end 2015, 2016 started out as one of the most promising years in half a decade. Although the West was still dry, the high-level Sierra Nevada snowpack depths even offered optimism in California.

While overall conditions improved, signs of problems began to surface in March. Pockets of abnormal dryness began to develop across Texas and Oklahoma, into Oregon and stretching from the Southwest into North Dakota. Northern California continued to experience incremental improvement, while Southern California entered a fifth year of drought.

By early July, drought emerged in the interior Southeast and from the lower Great Lakes region into the Northeast. Drought pockets developed across the Northern Plains and upper Midwest, and returned to the Northwest. Central and Southern California remained the epicenter of long-term drought.

As of early August, drought intensified across the Plains, South, lower Great Lakes and Northeast, but had mostly shrunk in the Midwest. Conditions worsened in the Southeast and New England.

While many drought-affected areas in the central and eastern U.S. experienced some improvement by early September, conditions intensified in the Northeast, which collectively experienced its worst drought since 2002.

By November, exceptional drought covered a large area of the Southeast. In contrast, precipitation provided parts of the Northeast with drought relief. Wet weather covered the Northwest, and some improvement even reached Northern California, where statewide drought coverage hit its lowest level since April 30, 2013.

As 2016 came to a close, December precipitation – very heavy in some areas – again offered optimism the new year would be better from a moisture standpoint.

Exports overcome headwinds

Despite a strong U.S. dollar and other headwinds, U.S. alfalfa hay exports set a new volume record in 2016.

After a slow start, 2016 U.S. alfalfa hay exports picked up the pace, topping 200,000 metric tons (MT) for seven consecutive months (May-November; December totals were not yet available). Through November, alfalfa hay exports had already set a

new annual record high at more than 2.4 million MT, surpassing previous highs set in 2013 and 2015. Monthly exports of other hay lagged year-ago levels in most months, but were still on target to hit the largest volume since 2013.

While volumes were up for several hay-related products, lower prices resulted in lower export values per unit.

Top five foreign markets for U.S. alfalfa hay were China, Japan, United Arab Emirates (UAE), Saudi Arabia and South Korea. Increases to the UAE and Saudi Arabia came with an asterisk: Having previously purchased farm ground, mostly in the southwest U.S., in some cases they were exporting hay to themselves.

The global market was thrown into a state of confusion in late August, impacted by China's import restrictions over concerns the Zika virus could be spread through hay and the bankruptcy of South Korea's Hanlin Shipping Co., the world's seventh-largest shipping company. Later in the year, large inventories of hay acquired by China began to back up, adding to export demand concerns.

Production and inventories

Despite improved yields over 2015, alfalfa and alfalfa mixture dry hay production was down slightly due to a reduction in acres harvested.

• **Alfalfa and alfalfa mixtures:** Harvested area, at 16.9 million acres, was down 5 percent from a year earlier; average yield was estimated at 3.45 tons per acre, up 0.13 ton. At 58.3 million tons, total production was down 1 percent. Arizona, Arkansas, Idaho, Indiana, Iowa and Nebraska saw record-high yields; New Hampshire and Rhode Island saw record lows.

• **Other hay:** Harvested area, at 36.6 million acres, was down 4 percent from the previous year; average yield was estimated at a record 2.09 tons per acre. At 76.5 million tons, total harvest was up 1 percent. Indiana, Montana and Oregon saw record-high yields.

• **Total forages:** USDA estimated total forage production (all dry hay, haylage and green chop) in 17 major states at 90.7 million tons, down less than 1 percent from a year earlier. U.S. corn silage production was estimated at 125.7 million tons on 6.19 million acres, both down 1 percent from 2015. Average yields topped 20 tons per acre for a third consecutive year. With the smallest harvested area since 2011, sorghum

silage production was estimated at 4.17 million tons, down 7 percent.

• **Hay stocks:** U.S. farms entered the winter of 2016-2017 with the largest hay inventories since 2010. All hay stored on U.S. farms as of Dec. 1, 2016, totaled 95.8 million tons, up 1 percent from a year earlier. Production impacted by drought influenced regional hay inventories.

• **New alfalfa/mixture seedings:** Low hay prices may be the reason for reduced new seeding of alfalfa and alfalfa mixtures in 2016. At 2.268 million acres, the total is down about 11 percent from 2015 and the lowest acreage devoted to new seeding dating back to at least 1997. Largest declines in new seeding area were in Wisconsin, Michigan, Ohio, Nebraska and Minnesota; North Dakota, South Dakota and Montana posted the largest increases.

Markets and prices

After a slight uptick in spring, U.S. prices declined for eight consecutive months to end the year, pushing nationwide average prices to six-year lows.

For most of the country, 2016 was a good year to make hay. Selling it profitably might be another matter.

Calendar year 2016 U.S. alfalfa hay prices averaged \$140 per ton, with a peak of \$153 per ton in April and a low of \$129 per ton in December.

Calendar year 2016 U.S. other-hay prices averaged \$121 per ton, with a peak of \$130 per ton in April and a low of \$113 per ton in July.

Other factors

Land values were pressured lower, but interest rates are headed higher.

Low commodity prices and farm income pressured agricultural land values and cash rents lower in most parts of the U.S. in 2016. The Pacific Northwest was mostly buffered from the decline, with limited offerings met with strong demand.

Along with the hope hay prices will increase in 2017, producers will likely encounter something else they haven't seen in a while – rising interest rates. The Federal Reserve raised the benchmark interest rate 0.25 percent in December 2016 and hinted three similar increases may be coming in 2017.

2016 Top 10 states

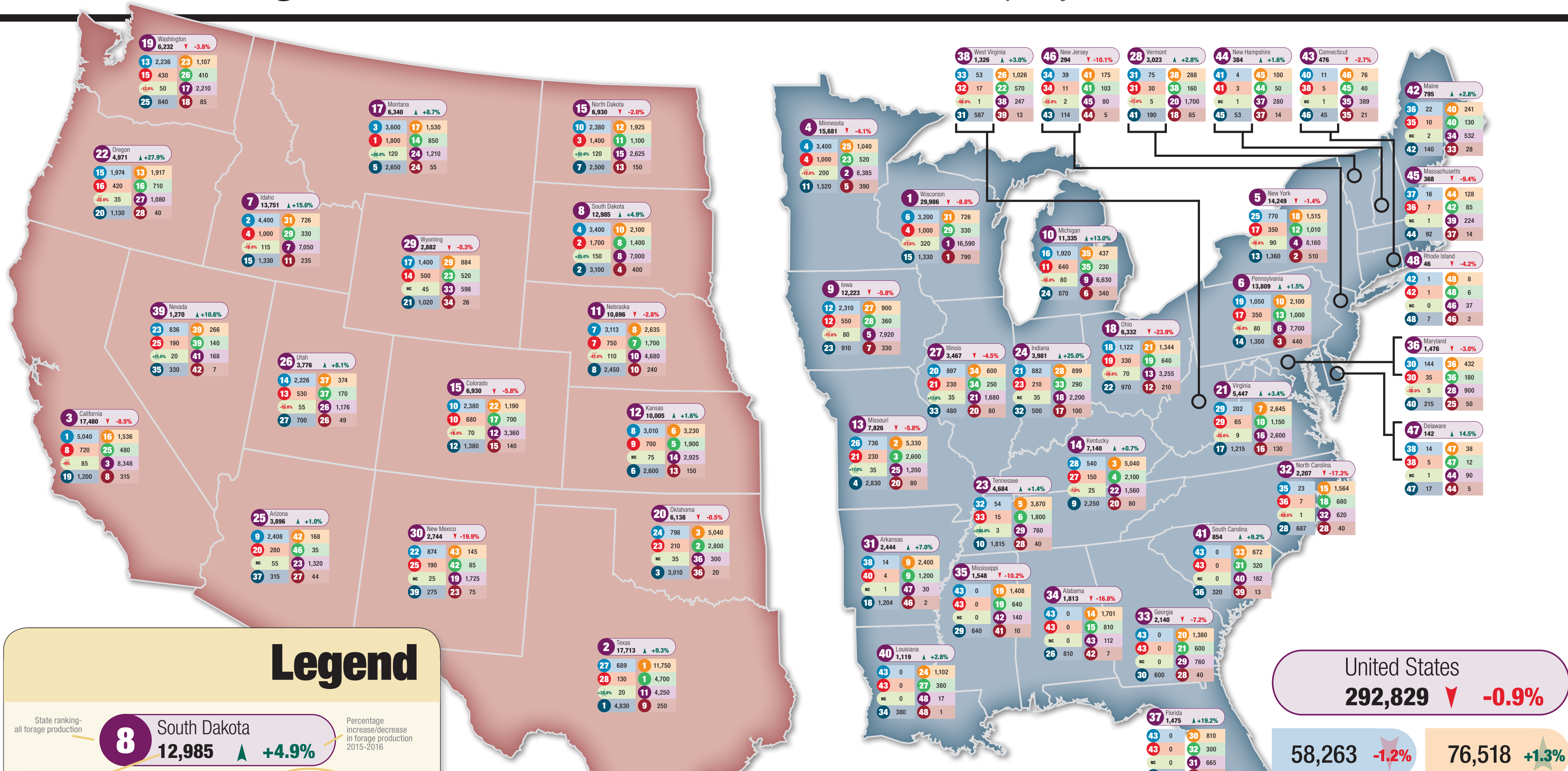
Alfalfa hay						
State ranking	State	Acreage (in thousand acres)	State	Yield (tons/acre)	State	Production (in thousand tons)
1	Montana	1,800	Arizona	8.6	California	5,040
2	South Dakota	1,700	California	7.0	Idaho	4,400
3	North Dakota	1,400	Texas	5.3	Montana	3,600
4			Washington	5.2	Minnesota, South Dakota	3,400
5	Idaho, Minnesota, Wisconsin	1,000	Oregon	4.7	Wisconsin	3,200
6			New Mexico	4.6	Nebraska	3,113
7	Nebraska	750	Idaho, Nevada	4.4	Kansas	3,010
8	California	720	Kansas	4.3	Arizona	2,408
9	Kansas	700	Indiana, Iowa, Utah	4.2	Colorado, N. Dakota	2,380
10	Colorado	680				

Corn silage						
State ranking	State	Acreage (in thousand acres)	State	Yield (tons/acre)	State	Production (in thousand tons)
1	Wisconsin	790	Wisconsin	16.590		
2	New York	510	Minnesota	8.385		
3	Pennsylvania	440	California	8.348		
4	South Dakota	400	New York	8.160		
5	Minnesota	390	Iowa	7.920		
6	Michigan	340	Pennsylvania	7.700		
7	Iowa	330	Idaho	7.050		
8	California	315	South Dakota	7.000		
9	Texas	250	Michigan	6.630		
10	Nebraska	240	Nebraska	4.680		

Sorghum silage						
State ranking	State	Acreage (in thousand acres)	State	Yield (tons/acre)	State	Production (in thousand tons)
1	Kansas	95	Kansas	1.473		
2	Texas	85	Texas	1.233		
3	South Dakota	40	South Dakota	520		
4	New Mexico	18	New Mexico	234		
5	Oklahoma	15	Oklahoma	153		
6	Colorado, Nebraska	10	Nebraska	150		
7			Nebraska	140		
8	Missouri	9	Missouri	90		
9	Georgia	8	Georgia	80		
10	North Carolina	4	North Carolina	40		

Source: USDA National Ag Statistics Service 2016 annual Crop Production report, Jan. 2017

2016 U.S. forage statistics



Legend

8 South Dakota
12,985 ▲ +4.9%

State ranking - all forage production

All forage production (in thousands of tons)

State ranking - alfalfa yield

Alfalfa yield (in thousands of tons)

State ranking - alfalfa acres

Alfalfa acres (in thousands of acres)

Percentage increase/decrease of alfalfa new plantings

Alfalfa new plantings (in thousands of acres)

State ranking - total hay acres

2016 Total hay acres (in thousands of acres)

Percentage increase/decrease in forage production 2015-2016

State ranking - other hay yield

Other hay yield (in thousands of tons)

State ranking - other hay acres

Other hay acres (in thousands of acres)

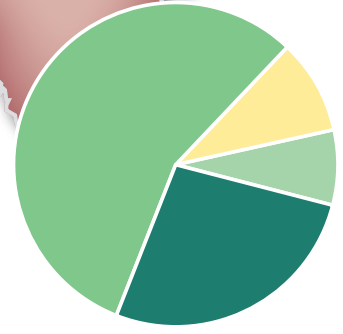
State ranking - corn silage yield

Corn silage yield (in thousands of tons)

State ranking - corn silage acres

Corn silage acres (in thousands of acres)

Source: Crop Production 2016 Summary Report, USDA, NASS. Statistical ties are represented by the same numerical ranking.

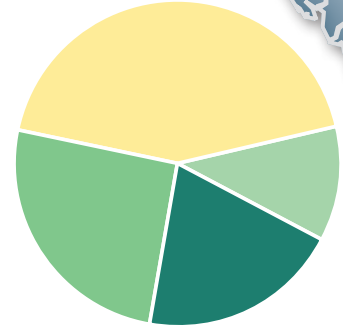


Total U.S. forage acres in thousands of acres

Other hay	36,211
Alfalfa	16,885
Silage	6,186
Greenchop	4,564
Combined total	64,211

Total U.S. tons harvested in thousands of tons

Other hay	20.3	125,670
Alfalfa	2.1	76,518
Silage	3.5	58,263
Greenchop	7.1	32,378
Combined total	292,829	



United States
292,829 ▼ -0.9%

58,263	-1.2%	76,518	+1.3%
16,885	-5.0%	36,576	-0.3%
2,268	-10.5%	125,670	-1.3%
53,461	-1.8%	6,186	-0.8%