

Onion Production in California

Patricia Lazicki, Daniel Geisseler and William R. Horwath

Types of Onion

Onions are classified according to the day length needed to produce a bulb. Short-day varieties are mostly produced in the southern desert valleys, long-day varieties in the high desert, towards the Oregon border, and intermediate-day varieties in the Central Valley and central coast (Figure 1).

Onions are also classified by their market purpose (fresh market or dehydrator). Fresh market onions are mostly short- and intermediate day. They are harvested by hand and either sold fresh or lightly processed, for products like onion rings. They tend to be sweeter and have a relatively low dry matter content (5-12%) [4]. Short-day varieties are often harvested while immature, and aren't stored [4]. Dehydrator onions, which can be short-day or long-day, have a higher pungency and high dry matter content (15-25%) [8]. Their harvest is mechanized. Both fresh and dehydrator types are grown throughout California (Figure 1).

California also grows onions for seed. The Imperial and Sacramento valleys are important centers for seed production [9].

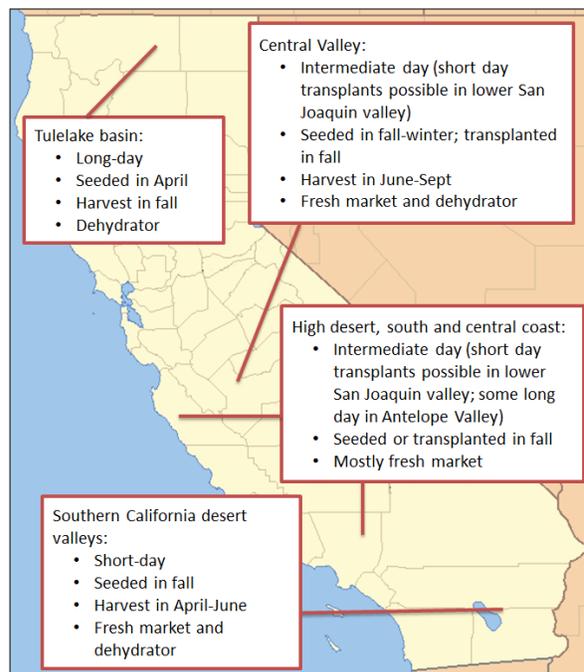


Figure 1: Major onion types grown in different regions of California [4,7,8].

Onion production in California

Onions were probably domesticated independently in several places. While historically different members of the onion family were used both in the Old and New World, the bulb types now commonly grown are Old World varieties brought by settlers from Europe [3]. It's not clear how onions first reached California, but they were an important crop in early California market gardens. The first official California agricultural report in 1852 lists the production of 5 million pounds of onions [1].

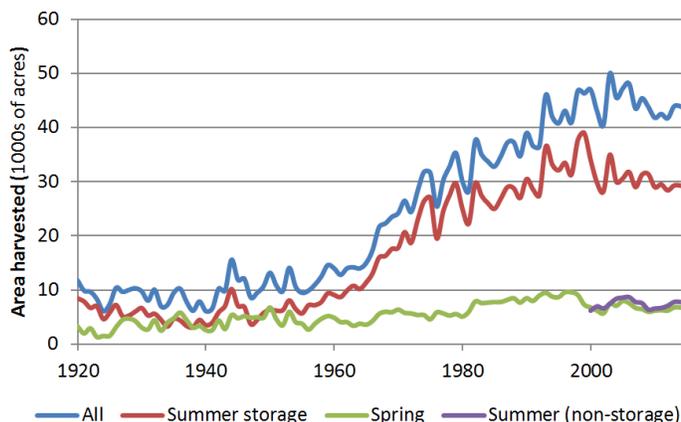


Figure 2: Acres of onions harvested in California since 1920 [6].

By 1917, California was an important source of onion seed for the rest of the nation; however, bulbs were not yet an important export ^[5,10]. Dehydrated onion products first started to become available in the 1930s, and during World War II the industry expanded due to increased demand for dehydrated products for the armed forces ^[2]. Since California produced most of the nation's processing onions, this

growth especially benefited the California onion industry.

California acreage of summer-harvested onions grew steadily in the second half of the 20th century (Figure 2) ^[6]. However, in recent decades it has stabilized ^[7]. Acreage of spring-harvested onions, by contrast, has remained comparatively stable since 1920 ^[6].

Today's Production

California is the largest onion producer in the US, and is the only state to produce both spring and summer-harvested onions. In 2015, it produced 31% of the nation's total onion crop. For summer-harvested onions other important producers are Washington and Oregon. About 16% of California onions are spring harvested. California produces 42% of the nation's spring-harvested onion crop, with other important producers being Georgia and Texas. Roughly half of California onions are grown for the fresh market, and about half for processing ^[7]. The proportion of spring, summer, fresh and processing onions tends to be stable ^[7].

Onions are grown throughout California (Figure 1). As of the 2012 census, the counties with the top onion acreage were Fresno,



Figure 3: Top onion-producing counties of California in 2012 ^[7].

Imperial, Kern, Siskiyou, and San Joaquin, with over a third of the state's acreage located in Fresno County (Figure 3). The high desert region of Antelope Valley in Los Angeles County and the Salinas Valley also include some fresh market onion acreage ^[7].

Yield

Current yields are more than double what they were in the 1920s (Figure 4). The steep rise in yields from the 1940s through 1960s are likely due to advances in the 1920s and 1930s in understanding the interactions between day length, temperature and bulbing. Breeding advances which led to the development of the first hybrid seeds in the 1940s also likely contributed to increasing yields ^[2].

California yields of spring-harvested (short-day) onions are considerably higher than average yields for Texas and Georgia,

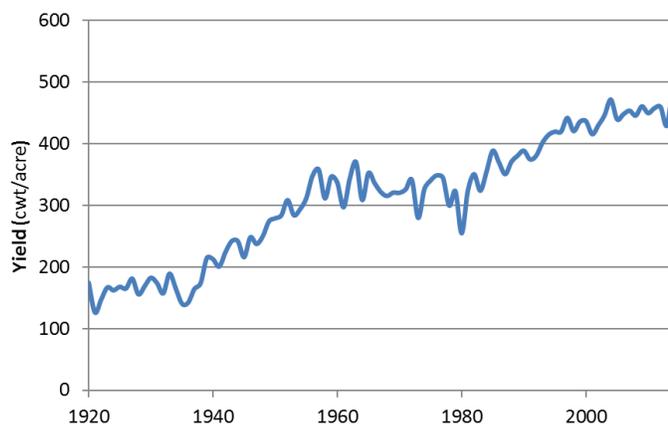


Figure 4: Average California onion yields since 1920 ^[6].

the other major producers^[7]. For summer harvested onions, yields in the Pacific Northwest

tend to be higher than those obtained in California^[7].

Fertilization

Based on surveys of onion growers conducted by the USDA from 1992 through 2014, annual N applications ranged between 200 and 300 lbs N/acre. In the same period, annual phosphate (P₂O₅) applications ranged between 117-222 lbs P₂O₅/acre. Annual potash

(K₂O) applications fluctuated around 100 lbs K₂O/acre. Nitrogen was applied by virtually all of the growers each year, while P was applied by 60-90% of growers. Between 20% and 60% of growers applied K^[7].

References

1. Bailey, L.H., 1910. Horticulture. In: Bailey, L.H., (Ed.). Cyclopedia of American Horticulture, Volume II, 7th Edition. The MacMillan Company, New York. pp. 755-772.
2. Jones, H.A., Mann, L.K., 1963. Onions and Their Allies. Interscience Publishers, Inc., New York.
3. National Onion Association, 2011. History of onions. Available online at: <https://www.onions-usa.org/all-about-onions/history-of-onions>
4. Smith, R., Biscaro, A., Cahn, M., Daugovish, O., Natwick, E., Nunez, J., Takele, E., Turini, T., 2011. Fresh-market bulb onion production in California. UC ANR Publication 7242. Available online at <http://anrcatalog.ucanr.edu/Details.aspx?itemNo=7242>
5. Thorburn, J.M., Morse, C.C., 1917. The seed trade of America. In: Bailey, L.H., (ed.). The Standard Cyclopedia of Horticulture, Vol. IV, 2nd Edition. The Macmillan Company, New York. pp. 3136-3137.
6. USDA NASS. Historical Data. Available online at http://www.nass.usda.gov/Statistics_by_State/California/Historical_Data/index.php#Vegetable_and_Melon_Crops (Accessed January, 2016)
7. USDA NASS. Quickstats. Available online at: <http://quickstats.nass.usda.gov/> (Accessed January 2016)
8. Voss, R.E., Mayberry, K.S., 1999. Dehydrator bulb onion production in California. UC ANR Publication 7239. Available online at: <http://anrcatalog.ucdavis.edu/pdf/7239.pdf>
9. Voss, R.E., Murray, M., Bradford, K., Mayberry, K.S., Miller, I., Long, R., Gillespie, S., 2013. Onion seed production in California. ANR Publication 8008. Available online at: <http://anrcatalog.ucanr.edu/pdf/8008.pdf>
10. Wickson, E.J., 1917. Vegetable-growing in California. In: Bailey, L.H., (Ed.). The Standard Cyclopedia of Horticulture, Vol. IV, 2nd Edition. The Macmillan Company, New York. pp. 3437-3438.

Patricia Lazicki is an Assistant Specialist in the Department of Land, Air and Water Resources at the University of California, Davis.

Daniel Geisseler is an Assistant Cooperative Extension Specialist in Nutrient Management in the Department of Land, Air and Water Resources at the University of California, Davis.

William R. Horwath is professor of Soils and Biogeochemistry in the Department of Land, Air and Water Resources and the James G. Boswell Endowed Chair in Soil Science at the University of California, Davis.

The document has been prepared within the project "Assessment of Plant Fertility and Fertilizer Requirements for Agricultural Crops in California", funded by the California Department of Food and Agriculture Fertilizer Research and Education Program (FREP).

This document is available online at https://apps1.cdfa.ca.gov/FertilizerResearch/docs/Onion_Production_CA.pdf

Last update: June, 2016