



NEW MEXICO CLIMATE CENTER

New Mexico Onions

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New Mexico onion acreage in the last five years has ranged from 7 to 9 thousand acres, valued between \$30 and \$50 million. Onion production in New Mexico is concentrated in the Mesilla and Hatch valleys and in southwestern counties. Smaller acreages are located in the Pecos Valley, the Plains area near Clovis, and on the Navajo Irrigation Project in northwestern New Mexico. All regions except the northwestern area market only fresh market (non-storage) onions.

The long harvesting and marketing season is a major advantage for the New Mexico industry. It increases efficiency by increasing the number of days each year that specialized equipment and facilities are used, and it helps to stabilize labor supply by providing work over an extended period. The long season improves marketing position by providing a continuous supply, and it helps producers spread risks by averaging market price. With these advantages the industry has grown steadily since its inception in the 1930s.

The onion industry in southern New Mexico is based on varieties that are planted in September and October for harvest in June, and varieties planted in January and February for harvest in July and August. The NMSU Agricultural Experiment Station has long supported onion industry development through research. In 1931 Fabian Garcia named and released the New Mexico Early Grano (NMEG) variety, which was the basis for early industry growth throughout the southwestern U.S. NMEG has been replaced by other varieties; however, most fall-planted varieties now grown in the southwestern U.S. trace their origin at least in part to NMEG. For example, varieties marketed as 'Vidalia' or 'Maui Sweet' onions are hybrids between a bermuda type and selections originating from NMEG. J.V. Enzie, a researcher, selected a white onion out of NMEG, called New Mexico White Grano (NMWG), and it is still an important variety.

The present NMSU Experiment Station program seeks to improve varieties for resistance to bolting (seedstalk production), resistance to pink root disease, improved handling characteristics, and cold hardiness. We are also concentrating efforts to develop improved varieties with low pungency, so the New Mexico industry can promote and market a sweet onion from June through August. In addition, we are developing high-solids varieties suitable for dehydration. As

adapted high-solids varieties become available, we expect an onion dehydration industry will develop in southern New Mexico. The present chile dehydrating facilities could be used for onions during June and July, before red chile is harvested.

The New Mexico Dry Onion Commission was organized in 1983, and has since contributed more than \$200,000 to support the NMSU Experiment Station onion research program. In addition, the Commission acts as an industry advisory committee to the research program. This is an excellent example of an industry helping itself through research. Funds generated by the José Fernández Chair in crop production also currently support onion research. These funds added to Experiment Station funds give us the resources to maintain a strong research program.

Variety releases since 1980 have stimulated industry growth (Table 1). All have been improved for pink root resistance and the fall-planted ones have resistance to bolting, leading to significantly improved yields for the fall-planted crop. Bolting resistance permits earlier fall planting, which results in larger plant size, larger bulbs, and greater yields. We have improved varieties for pink root resistance so that pink root is no longer a serious production constraint.

Table 1. Onion varieties released by the New Mexico Agriculture Experiment Station since 1980.

Variety	Year Released	Color	Planting Season
NuMex BR 1	1981	Yellow	Fall
NuMex Sunlite	1986	Yellow	Fall
NuMex Sundial	1986	Yellow	Fall
NuMex Suntop	1986	Yellow	Fall
NuMex Starlite	1990	Yellow	Fall
NuMex Casper	1993	White	Spring

While breeding efforts for production characteristics continue, several challenges remain for genetic improvement of onion quality and flavor components. A group of New Mexico growers working with an onion shipper began a promotion for 'Carzalia Sweet' onions several years ago. The onions are grown in the Carzalia valley, west of Columbus, NM, and the variety used is one developed by the Experiment Station program. The variety was judged the best overall sweet onion in a California contest in 1993.

The New Mexico Dry Onion Commission also began a promotional program to market 'Nu-Mex Sweet' onion varieties, which initiated using the varieties 'NuMex BR 1' and 'NuMex Starlite', which mature in early June. The NMAES breeding program is developing additional sweet varieties maturing through July and early August. As these are released the 'Nu-Mex Sweet' and 'Carzalia Sweet' promotions will be strengthened.

The June-maturing varieties encounter strong competition from the Georgia Vidalia, the Texas Sweet, and the Imperial Sweet promotions. In the later seasons (July and August), there is less

competition from sweet onion promotions. A 'Nu-Mex Sweet' entry into the late summer sweet onion markets should be considerably easier than in the June markets. The ability of the New Mexico industry to market late-summer sweet onions depends on suitable varieties from the NMSU AES program. Because of its potential benefit to the New Mexico industry, the Experiment Station program to develop July- and August-maturing "sweet" varieties is a high priority.

A "sweet" onion is actually a low pungency one. Pungency develops when onion tissue is cut, bruised, or macerated and volatile sulfur compounds characteristic of onion flavor and aroma are formed, as well as ammonia and pyruvic acid. A highly pungent onion has more reaction products than a mild onion, but direct measurement of the volatile sulfur components is difficult and time consuming. A reaction product, pyruvic acid, can be measured rapidly and used to screen many samples. The pungency of breeding material is determined in the laboratory by measuring pyruvic acid formation in individual bulbs. Bulbs with the lowest pungency are selected and advanced to another generation.

Although the main market for New Mexico onions is fresh market dry bulb onions, some are sold to processors for ring processing or other frozen products. While ring processors demand onions that have single centers, many of the varieties grown in New Mexico do not qualify because they tend to have double or triple centers. One of the selection criteria in the NMSU Experiment Station breeding program is for single-centered bulbs. By releasing productive, adapted varieties that qualify for ring processing, we can provide additional marketing options to New Mexico onion producers and help strengthen the industry.

New Mexico's onion industry has grown from only a few hundred acres in the 1930s to more than 8,000 acres in 1993, and onions are one of the most important crops in the state. During peak harvest seasons in June and early July, New Mexico supplies as much as half of the U.S. consumption of dry bulb onions. As marketing of dry bulb onions is highly competitive, the ability of the New Mexico onion industry to continue its expansion depends on highly efficient production and marketing. Promotional activities like the sweet onion program and the exploitation of new markets for dehydrated or frozen onion products will contribute to the future industry strength. The NMSU AES onion genetic improvement program is designed to support New Mexico's onion industry as it seeks to improve its position in the world arena.