

MAGNIFICO . . .

a promising new globe artichoke variety

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Representative terminal bud (center) and developing secondary (axillary) buds of new Globe artichoke variety, Magnifico.

Globe artichokes are a uniquely Californian vegetable in the U.S., and account for about 4% of world-wide production. The one variety, Green Globe, has been the mainstay of the California industry for many years, but consideration of present and future production needs of California growers (as well as the potential benefits of a broader base of varietal sources) has resulted in initiation of a varietal improvement program. Magnifico, discovered early in this program, has several favorable characteristics indicating potential value as a complementary variety with Green Globe.

GLOBE ARTICHOKE (*Cynara scolymus* L.) appeared as a commercial crop in California sometime near 1900. The introduction of artichokes was closely associated with the immigration of southern Europeans to California. Some of the immigrants who entered farming brought with them, or later acquired, artichoke plants from their native areas. Very

likely, these sources also introduced some plant type variations. At present, all of the production is from the same type of plant, which produces green, globe-shaped buds that are aptly named Green Globe.

Green Globe, because of its past performance characteristics, has apparently satisfied production and marketing objectives better than other types of artichokes. However, considerable varietal improvement would be beneficial at this time, and certainly will be required to meet future needs. With this in mind, a project was initiated to search for plant types with characteristics better suited for future requirements.

Some of the objectives of this search were to obtain improvement in (1) yield and quality characteristics, (2) disease and insect resistance, (3) cultural and harvesting efficiency, (4) frost tolerance, and (5) development of varieties having specific adaptability for fresh market and processing purposes. An objective of significant, but lesser priority, included the selection of plant types having unique foliage or floral characteristics for use

either as ornamental plants, or for dried floral arrangements.

While selection within Green Globe types offers the possibility for attaining some of the stated objectives, it was thought that the examination of different sources of plant material would offer a greater probability for achieving improved plant characteristics. This approach was made more feasible by the collaboration of Dr. Vito Bianco and Dr. Vittorio Marzi of the Istituto di Agronomia e Coltivazioni Erbracee, University of Bari, Italy. They provided seed from their extensive world collection of artichoke varieties. Seed was used because USDA Plant Quarantine phytopathological restrictions precluded entry of vegetative clones.

Such sources can and probably will be utilized, if certified to be pest and disease free and grown in isolation to verify this status. An arrangement for obtaining vegetative material rather than seed has been explored and appears feasible. The use of seed has some limitations because seedlings obtained often are off-types. However, a sufficient number of the seed-



lings produced are true to the named variety and therefore suitable for evaluation.

This progress report briefly describes some of the performance characteristics of the globe artichoke variety, which is named Magnifico, and which is a product of this search. The evaluation procedures used to obtain this variety are also discussed.

Magnifico is noticeably different from Green Globe in color, bud quality, plant vigor and yield, leaf characteristics and cold tolerance.

Rose-colored bracts

Bracts in large buds of Magnifico are red or rose colored at the base, edge, and tip. Young developing buds are more intensely colored than older buds. Internal development of the floral structure of Magnifico buds is similar to that of Green Globe, although Magnifico has a heavier and thicker heart area. In terms of quality, buds of Magnifico have bracts which have much thicker flesh than Green Globe. The eating quality of Magnifico, particularly with regard to flavor, was judged to be better than Green Globe. Comparing buds of equal size, those of Magnifico were noticeably heavier. Upon cooking, the reddish anthocyanin pigment disappears. Interior color is a creamy white and appears more attractive than that of Green Globe. It is believed the color and flavor differences will favor the acceptance and use of Magnifico. Arrangements have been made with a road-side market operator to test this premise.

The terminal bud of Magnifico is usually very large and remains fairly compact with relatively little bract spreading. Axillary buds which develop on Magnifico flower stalks are much more advanced than is typical for Green Globe. Four to five fairly large-sized buds per stalk are usually harvested, whereas with Green Globe plants the lower axillary buds develop rather slowly and often are too small for fresh market purposes. Thus, in addition to the larger average size of buds, an average of one extra bud per stalk could be obtained from Magnifico plants, as compared with those from Green Globe.

Magnifico shows extremely vigorous growth as well as early production and abundant foliage. Plants are prolific in flower stalk development. The bud-bearing stalks are very thick and heavy, although not as tall as those of Green Globe. They averaged slightly less than 3 ft in height. The foliage of Magnifico is a

much darker green than that of Green Globe plants, with thicker leaves that are much coarser in texture and surface, and noticeably less divided.

During the past three years of field evaluations, Magnifico has been observed to tolerate low temperatures slightly better than Green Globe. Buds of Magnifico showed less blistering of the bract epidermis and less injury to the bud stem when exposed to subfreezing temperature conditions. Very low temperatures, as in the unusually severe winter of 1972 were damaging to all plant parts, although subsequent recovery by Magnifico plants was somewhat more rapid. Plant resistance to insect attack was not evident, and plants and buds of both Magnifico and Green Globe were equally damaged by plume moth larvae.

Based upon observed performance, Magnifico may have excellent processing and fresh market possibilities. It is not thought that Magnifico would replace Green Globe, but that perhaps it might complement the overall production of California artichokes.

Varietal improvement

This project, seeking varietal improvement, was initiated in March of 1968. Seeds from fifteen distinctive varieties of varying plant types were obtained from Italy to produce seedlings for performance evaluation. Varieties used were: Bianco Nostrano, Catanese, Centrofoglie, Empolese, Locale di Ostuni, Maggaferrata, Moretto, Nostrano, Nostrano Tipo Nero, Precoce di Jesi, Romano, Violetto, Violetto di Maremma, Violetto di Toscano, Violetto Precoce.

It became apparent from the appearance and early development of the seedlings that considerable cross fertilization had occurred in the Italian seed field. Marked variations of foliage characteristics from each seed source was evident although a proportion of the plants appeared to be true to type. Off-type seedlings were immediately discarded and roguing continued in field plantings.

In March of 1969, remnant seeds of the 1968 source were used to produce additional seedlings for field evaluation. In March of 1970, another 17 seed lots were similarly handled. Of these, eight were known varieties while nine were numbered breeding lines. These were: Catanese, Centrofoglie, Empolese, Locale di Mola, Mazzaferrata Termoli, Moretto, Romana, Violetto di Maremma, 24, 36, 75, 79, 119, 127, 164, 203, 206.

In each case, seeds were germinated in the Vegetable Crops greenhouses at

Davis, transplanted to four-inch plastic pots and transferred to a lath house. The seedlings were grown in the lath house until three to six months old and then field planted at several coastal locations climatically suitable for artichoke production. These locations were in the Ferndale area of Humboldt County; at Pescadero, San Mateo County; and Guadalupe, Santa Barbara County. From 50 to several hundred seedlings were transplanted depending upon the area provided by farmer cooperators. A total of nearly 3000 individual seedlings were examined in the field. At least another 3000 were discarded while in the early seedling stage, before field planting. A field planting was made at the Vegetable Crops Department farm, but climatic conditions did not favor typical growth, and evaluations at Davis were discontinued.

Plantings examined

Plantings at these locations were periodically examined for favorable bud and plant characteristics consistent with the project objectives. The failure rate was extremely high since only one plant of all those examined was found to show promise. This originated from the 1968 seed source of the variety, Centrofoglie. The resultant seedling (Magnifico) was not typical of the Centrofoglie type. Therefore, the likelihood is high that the pollen parent was not from the Centrofoglie variety. Magnifico was found in the planting made on the Giannini ranch in Pescadero, and was vegetatively increased each year until 200 plants are now under further field evaluation. Further evaluation of Magnifico and other selection sources seems warranted.

The chances of artichoke improvement through simple selection procedures appear encouraging, especially if the range of selection material is increased. Plant introduction from the Mediterranean region, where the greatest concentration of artichoke production is centered, could supply such selection materials. Exploitation of this source will be continued. Justification for an artichoke plant breeding program has not been fully assessed. Such an effort would likely take a long time, and perhaps a selection program might be as rewarding.

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