

GREEN Chickpeas

Bringing Florida a New Vegetable from the Semi-Arid Tropics

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C Chickpea, also known as garbanzo bean, is the second-most economically important food legume in the world. Chickpea seeds are important dietary components in places including South Asia, East Africa and the Middle East. In these locations and elsewhere where it is consumed, chickpea serves as a significant source of vitamins (B1, B2, B5, B6), minerals (zinc, calcium, magnesium, manganese) and carbohydrates. It is one of only two legume crops that provide all essential amino acids (the other is soybean).

In addition to being nutrient-rich, Chickpea is beneficial to farmers. Like other legumes, it forms symbiotic relationships with nitrogen-fixing bacteria, giving it access to a form of nitrogen not available to other plants. Some of this nitrogen ends up in the seeds or other harvested organs of our crop legumes. Some of the nitrogen remains in the legume, and is returned to the soil as biologically active nitrogen—which other plants can use—when roots and shoots of the legume senesce. Consequently, legumes that occur in natural ecosystems, or that are used in crop rotations with non-legumes, provide a natural source of nitrogen fertilizer, reducing the need for man-made fertilizer and providing residual nitrogen to subsequent crops. This carryover nitrogen can lower farmers' costs and reduce ecological impacts of fertilizer use, such as runoff polluting waterways. Additionally, chickpea can be further improved by pairing it with nitrogen-fixing bacteria that are better adapted to both their plant host and the soil. These



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cultured bio-inoculants can be sold to growers, and at a much lower price than fertilizers. These nutritional and ecological benefits, and potential economic gains, make chickpea particularly attractive as a major crop in agronomic systems worldwide.

In the West, we largely know chickpea as the primary ingredient in hummus, or as a whole seed used in salads or cooking. In South Asia, East Africa and Southern Europe, chickpea is widely used as flour, as well as a whole seed. In places including Turkey, Ethiopia and the Indian subcontinent, it is also consumed while still green, before it has fully matured. The chlorophyll in chickpea seeds and pods degrades as they transition to seed maturation. During seed maturation, seeds also lose many vitamins, minerals and metabolites needed for a functioning photosynthetic cell. Consequently, consuming chickpeas while they are still green improves the legume's already high nutritional value.

Freshly harvested green chickpea progressively turns yellow from natural aging. To slow this process and ensure the marketability of green chickpea, it may be brought to market soon after harvest, or it may be



stored in chilled or freezing conditions. The frozen green chickpeas now available at some natural-food-oriented retailers are harvested and processed this way. However, some rare varieties of “stay-green” chickpea retain their chlorophyll (and their green color) after maturation. This implies that such persistently green varieties of chickpea are likely to retain their color when harvested as fresh vegetables, which would prolong the period during which they retain appeal to consumers. In other crops, some stay-green varieties, in addition to their higher nutrient levels, show improved drought tolerance, raising the possibility that similar tolerance may exist with green-seeded chickpea. These characteristics are likely beneficial in many places, from semi-arid regions of East Africa and South Asia to here in Florida, where seasonal conditions swing from heavy rains to periods of prolonged drought.

With their high nutritional benefits and long shelf life, green chickpea varieties have great potential as a vegetable crop. Yet, no national market has developed in the U.S. Recognizing the opportunity to introduce and improve upon a favored form of chickpea from the wider world, we have begun work to test green chickpea varieties for Florida's market. Furthermore, we are exploring possibilities of testing these green-seeded varieties as a fresh vegetable with partners in India (which accounts for much of the world's chickpea consumption). We have begun growth trials and assessment of agronomic potential at the Center for Tropical Plant Conservation at Fairchild. We hope this work stimulates interest in the production, marketing and consumption of green-seeded chickpeas in South Florida and beyond. 