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Fertilizing Tomatoes for Delicious Fruits

by Manjula Nathan

We all prefer to have delicious tomatoes from our garden. In addition to taste, commercial growers try to produce quality tomatoes to market their crop. To attain these goals, it is important for you to focus on fertilizing your tomatoes to get delicious and quality fruits. An article on "Fertilizing for Delicious Tomatoes" written by Dr. Rob Mikkelsen in Plant Nutrition Today did a nice job of summarizing this topic. Below are some key points from his article that will be of use to our avid gardeners.

Managing soil fertility and application of plant nutrients, as per soil test recommendations, will influence the quality of the tomatoes and is essential to harvesting abundant, flavorful, and nutritious tomatoes. (Mikkelsen, 2017). Soil test provides an understanding of what nutrients are already present so that the lab can provide the fertilizer and lime recommendations. Applying fertilizers without testing your soil, can cause imbalance of nutrients and will end up having plants that grow but doesn't produce any or much fruits. So remember, soil testing is the first step for growing quality tomatoes.

Tomato flavor preferences may differ depending on individuals. The intensity of flavor properties of tomato fruits is determined by the amount of sugar, organic acid content (citric, malic and total acidity) and the volatile compound composition. Normally people find the best flavor to be associated with high soluble solids, high sugar, and high acid content. Light has the most profound effects on fruit sugar concentration. This results in winter grown greenhouse tomatoes, having less sugar than field grown tomatoes produced in summer.

Effects of nitrogen (N), phosphorus (P), and potassium (K) on tomato quality: Research studies examining the effect of plant nutrients in tomatoes revealed tomatoes receiving enhanced NPK nutrition (150%) had fruits with better quality, color and market acceptability than the ones receiving standard NPK nutrition (100%). Many studies have shown P and K nutrition has positive effects on fruit sugar and acid content. High P application was shown to produce higher sugar content in tomatoes when compared to low P conditions. Supply of K had been found to increase acid content of tomatoes. Many studies have reported moderate N supply will improve tomato flavor, but excess N can harm the fruit favor. Heavy N and K fertilization can also have detrimental effects on fruit favor.

Research has shown when adequate K is supplied, tomatoes respond by producing more of the health promoting carotenoids and red lycopene which results in red color in tomatoes. Tomato variety selection, degree of ripeness, growing conditions and providing adequate plant nutrition are all important in producing tasty tomatoes with better flavor and appearance.

Source: Mikkelsen, R. L., 2017. Fertilizing for Delicious Tomatoes? Plant Nutrition Today 2017. Issue 2, No 3.

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June: Pea Pickin' Time

by David Trinklein

Fans of the late entertainer Tennessee Ernie Ford remember well his catch-phrase: "Bless your pea-pickin' heart." History does not record how many peas Mr. Ford actually harvested himself, but chances are most of them would have been picked in June. The association of this vegetable with the sixth month of the year is so common that June pea often is used as a synonym for garden pea.

Few things can match the culinary delight of fresh peas from the family garden. As is the case with sweet corn, peas are tastiest immediately after being picked. However, peas represent an example of a food that requires a bit of work before it can be enjoyed but, for most, hulling peas is a labor of love because of the end results. In addition to being almost unbearably delectable, peas provide valuable vitamins and minerals to the human diet while possessing only modest caloric content.

The word "pea" was derived from the Latin word pisum which (later) was introduced into the English language as pease. The nursery rhyme "pease porridge hot" makes reference to what we today call garden pea. Since people often associated a word ending with "s" as being plural, pea gradually became the singular notation. The term pea is somewhat generic and can refer to different species in the Fabaceae, family depending on country or region. Black-eyed pea, pigeon pea and cow pea are examples of species that commonly are referred to as peas in the areas they are popular. For most, however, pea refers to Pisum sativum, or garden pea. Snap pea and snow (sugar) pea represent biotypes of the species whose entire pod can be consumed when harvested at an early stage of maturity.

The primary center of origin for pea is believed to be Middle Asia, from northwest India through Afghanistan. Cultivation of peas dates back 5000 years to the Bronze Age. It probably was first grown for its dried seed and used as pulse crops are used today. It is known the Greeks and Romans grew peas before the Christian era, but writings indicate they held no special favor for the crop. Ancient types of peas probably were much smaller, darker colored and differed otherwise from modern garden types.

The first mention in the literature of "green peas" (eaten immature) came after the Norman Conquest of England. By the 12th century, peas were listed among the food crops

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stored in a convent near London. In the 16th century, King Henry II of France married Catherine de Medici of Italy. She brought with her to France many of her favorite foods from Italy, including small peas the French called petit pois. They were quite different from the dried peas the French associated with peasant fare.

By the end of the 17th century peas were a rare delicacy among the elite of France and handsome prices were reportedly paid for them. The obsession people of that era had for peas is reflected in the writing of Madame de Maintenon (second wife of King Louis XIV) who noted, "Some ladies, even after having supped at the Royal Table, and well supped too, returning to their own homes, at the risk of suffering from indigestion, will again eat peas before going to bed. It is both a fashion and a madness".

During this time, new varieties of peas were developed in England giving rise to "English pea" as another synonym for garden pea. It is reported that Thomas Jefferson grew over 30 varieties of peas at Monticello and, soon thereafter, peas became a staple in the diet of many Americans.

Garden pea is a cool-season crop that tolerates light frosts and has the ability to germinate in relatively cool soil temperatures. Since warm summer temperatures (≥ 80 degrees F.) adversely affect both yield and quality, planting should be done early in the spring as soon as the soil can be worked. Peas prefer a well-drained garden loam with a pH of between 6.0 and 6.5. Sow seeds directly in the soil about one inch deep and two inches apart in rows spaced between 18 and 24 inches apart. Taller varieties will need three feet between rows as well as some method of trellising or support.

Fertilizer application should be based on soil tests and done before seeds are planted. Consistent with other legumes, peas (with the aid of symbiotic bacteria) have the ability to fix atmospheric nitrogen. However, if plants appear chlorotic after pods begin to set, a side dressing of nitrogen may be necessary. Peas prefer soil that is kept uniformly moist but not wet.

Although peas are relatively pest free, aphids, leafhoppers, and seed corn maggots can be problematic. Diseases that can be problematic include fusarium wilt, powdery mildew as well as root and seed rot. The latter can be especially troublesome in poorly drained soil or during wet springs. Rotating planting location in the garden from year-to-year is helpful in the management of diseases of peas.

Since peas do not compete well with weeds the latter must be controlled. Hand weeding and cultivation probably are the most logical way to control weeds in home garden plantings. For those who want to use herbicides, trifluralin (Treflan®) and pendimethalin (Prowl®) are labeled for weed control in peas.

Depending on cultivar, planting date and seasonal temperatures, peas usually are ready for harvest about the middle of June. Harvest normally lasts for about two weeks. Timing the harvest of peas is critical for top eating quality. Pick the pods as soon as they have swollen (appear round). Peas allowed to mature on the plant too long tend to convert sugars to starch, thus reducing their sweetness.

There are several cultivars of garden pea that do well in our area. Popular choices include Spring (57 days; 22 inches tall), Sparkle (60 days; 18 inches tall), Little Marvel (63 days; 18 inches tall), Lincoln (67 days; 30 inches tall), Green Arrow (68 days; 28 inches tall), Bolero (69 days; 28 inches tall), and Wando (70 days; 30 inches tall). Taller cultivars require trellising of some sort, while shorter one (18 inches tall) can be grown without.

As previously mentioned, peas are a good source of certain vitamins and minerals as well as insoluble dietary fiber. The latter has been shown to reduce cholesterol. One-half cup of cooked peas contains the following nutrients: 67 calories, 2.4 grams dietary fiber, 4.3 grams protein, 12.5 grams carbohydrates, 478 IU vitamin A, 11.4 mg. vitamin C, 50.7 micrograms folic acid, 1.2 mg iron, 217 mg potassium and 31 mg magnesium.

Peas from the garden freeze exceptionally well but must be blanched in order to keep enzymes and bacteria from destroying nutrients and changing color, flavor and texture. Blanching is accomplished by immersing peas in boiling water for about two minutes followed by cooling them in ice water.

Fresh or frozen, peas may be prepared in a number of different ways or combined with a variety of dishes. Simply put, (lightly) buttered peas fresh from the garden is one of life's unique pleasures.

JULY GARDENING CALENDAR

Category	Week				Activity
	1	2	3	4	
Ornamentals	x	x	x	x	Provide water in the garden for the birds, especially during dry weather.
	x	x	x	x	Remove infected leaves from roses. Pick up fallen leaves. Continue fungicidal sprays as needed.
	x	x	x	x	While spraying roses with fungicides, mix extra and spray hardy phlox to prevent powdery mildew.
	x	x	x	x	Newly planted trees and shrubs should continue to be watered thoroughly, once a week.
	x	x	x	x	Fertilize container plants every 2 weeks with a water soluble solution.
	x	x	x	x	Keep weeds from making seeds now. This will mean less weeding next year.
	x	x	x	x	Keep deadheading spent annual flowers for continued bloom.
	x	x	x	x	Perennials that have finished blooming should be deadheaded. Cut back the foliage some to encourage tidier appearance.
	x	x			Plant zinnia seed by July 4th for late bloom in annual border.
	x	x			Spray hollies for leaf miner control.
	x	x			Prune climbing roses and rambler roses after bloom.
	x	x			Apply final treatment for borers on hardwood trees.
	x				Apply no fertilizers to trees and shrubs after July 4th. Fertilizing late may cause lush growth that is apt to winter kill.
	x				Hot, dry weather is ideal for spider mite development. With spider mite damage, leaves may be speckled above and yellowed below. Evergreen needles appear dull gray-green to yellow or brown. Damage may be present even before webs are noticed.
		x	x		Fall webworms begin nest building near the ends of branches of infested trees. Prune off webs. Spray with Bt if defoliation becomes severe.
		x			Divide and reset oriental poppies after flowering as the foliage dies.
			x	x	Semi-hardwood cuttings of spring flowering shrubs can be made now.
			x	x	Summer pruning of shade trees can be done now.
			x		Powdery mildew is unsightly on lilacs, but rarely harmful. Shrubs grown in full sun are less prone to this disease.
				x	Divide bearded iris now.
		x			Don't pinch mums after mid-July or you may delay flowering.

Gardening Calendar supplied by the staff of the William T. Kemper Center for Home Gardening located at the Missouri Botanical Garden in St. Louis, Missouri. (***www.GardeningHelp.org***)

JULY GARDENING CALENDAR

Category	Week				Activity
	1	2	3	4	
Lawns	x	x	x	x	Water frequently enough to prevent wilting. Early morning irrigation allows turf to dry before nightfall and will reduce the chance of disease.
			x	x	Monitor lawns for newly hatched white grubs. If damage is occurring, apply appropriate controls, following product label directions.
Vegetables	x	x	x	x	Blossom-end rot of tomato and peppers occurs when soil moisture is uneven. Water when soils begin to dry; maintain a 2-3 inch layer of mulch.
	x				To minimize insect damage to squash and cucumber plants, try covering them with lightweight floating row covers. Remove covers once plants flower.
		x			Dig potatoes when the tops die. Plant fall potatoes by the 15th.
			x	x	For the fall garden, sow seeds of collards, kale, sweet corn and summer squash as earlier crops are harvested.
			x	x	Set out broccoli, cabbage, and cauliflower transplants for the fall garden.
			x		Sweet corn is ripe when the silks turn brown.
			x		Keep cukes well watered. Drought conditions will cause bitter fruit.
			x		Harvest onions and garlic when the tops turn brown.
				x	Sow seeds of carrots, beets, turnips, and winter radish for fall harvest.
	x	x	x	x	Cover grape clusters loosely with paper sacks to provide some protection from marauding birds.
	x				Prune out and destroy old fruiting canes of raspberries after harvest is complete.
	x				Blackberries are ripening now.
		x	x		Apply second spray to trunks of peach trees for peach borers.
			x	x	Early peach varieties ripen now.
				x	Thornless blackberries ripen now.