Kolomikta Kiwi

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The 1990 Membership Dividend from the Arnold Arboretum.

Exceptional hardiness, vigorous growth, delicious fruit, and brightly variegated leaves are the attributes that make the kolomikta kiwi (*Actinidia kolomikta*) the choice for the 1990 plant distribution to the Friends of the Arnold Arboretum. Native to Manchuria, Korea, Japan, and northeastern China, the plant was first described by Carl Maximowicz in 1856 from specimens he collected in the northern Amur river valley of Manchuria, where the plant was called “Kolomikta or Kotomikta” by the local inhabitants.

First introduced into Europe shortly after its discovery, *Actinidia kolomikta* was growing in France prior to 1872 and reached England by 1877. The Arnold Arboretum introduced the plant into North America when it obtained plants from Lavalle Nursery in Segrez, France, in 1880 and from Veitch and Sons Nursery in Chelsea, England, in 1881. The plant has been growing at the Arboretum ever since. In Western gardens, kolomikta kiwi is cultivated primarily for its pink-and-white variegated leaves.

The variegation pattern in *Actinidia kolomikta* is both distinctive and unpredictable. The new leaves emerge green and remain so until near the time of flowering in mid-May when the youngest leaves begin to change colors. The half of the leaf adjacent to the petiole holds its green color while its distal tip first turns a light metallic green. This light green tip eventually turns white, which then becomes tinged with pink or raspberry-rose, producing a dramatic tricolored effect. Interestingly, these color changes are limited to the upper surface of the leaf, the underside remaining a uniform dull green throughout the whole process.

The upper-surface variegation generally lasts several weeks until chlorophyll production returns to normal, masking the showy colors. While both male and female plants produce colorful leaves, growers report that the male plants produce the best foliage display. This has led to the selective propagation of male plants by nurseries, and may partially explain why very few plants in cultivation produce fruit.

It is not known what function these leaf-color changes serve in nature. Peter Del Tredici, of the Arboretum staff, has speculated that they may function to attract pollinators to the flowers, which are largely hidden beneath the leaves. It may be that the bright colors function like the red bracts of the poinsettia plant (*Euphorbia pulcherrima*), which attract pollinators to the tiny flowers in their midst. From a distance, the colored leaves of *Actinidia kolomikta* make the plant look as if it is covered with showy flowers. If the plant appears this way to insects, then it may well be that the brightly colored leaves function to attract pollinators from a greater distance than the flowers by themselves could. All this is speculation, however, and field work planned for this spring at the Arboretum will determine just how closely flower production and leaf coloration are linked.

Although this plant has been cultivated in North America for over a century, gardeners have only recently considered the genus *Actinidia* as a fruit-producing crop suitable for northern landscapes. Just two or three years
ago it was virtually impossible to locate kolomikta kiwi in nurseries, but now many offer it as a newly introduced plant. Unlike many other worthy species, the kolomikta kiwi was able to escape the confines of botanical gardens to reach a wider audience.

**Russian Research**

After a century of testing, considerable information has been gathered about this plant. It possesses exceptional cold hardiness, for it is said to be able to survive winters as low as -40 degrees Centigrade (-40 F) in parts of the Soviet Union. Such hardiness, coupled with its ability to produce a large crop of tasty fruits 18 millimeters long by 10 millimeters wide (0.7 inches by 0.4 inches), has made it a home-gardening success in the Soviet Union. Over the years, Russian horticulturists have introduced a number of cultivars whose fruits were selected for their earliness, size, flavor, sugar, and vitamin C content, as well as for their greater ability to stay on the vine once ripe.

In 1986, a number of these Russian cultivars were imported from the Vavilov Institute Agricultural Experiment Station in Leningrad by Northwoods Nursery in Molalla, Oregon. During the spring of 1989, Northwoods shared the following cultivars with the Arnold Arboretum for evaluation: ‘Aromatnaya,’ ‘Krupnopladnaya,’ ‘Matovaya,’ ‘Nahodka,’ ‘Paukste,’ ‘Pavlovskaya,’ ‘Sentyabraskaya,’ and ‘Urozainaya.’ According to Northwoods Nursery the cultivar ‘Krupnopladnaya’ means “large” in Russian, and this is the cultivar with the largest fruit presently cultivated in North America. Michael McConkey of Edible Landscapes in Afton, Virginia, reports that ‘Krupnopladnaya’ has proved the strongest, most
vigorous grower of the new Russian introductions in their area, and that it has attractive purplish winter stems.

The cultivar 'Ananasnaya Michurina,' developed by the famous Russian fruit breeder I. V. Michurin, has been represented in botanical gardens in this country for many years. The name translates as "Michurin's Pineapple" and refers to the flavor of the fruit. Michurin has written that 'Ananasnaya' was a selection from a group of third-generation Actinidia kolomikta seedlings raised in 1925. European growers who have seen and grown this plant believe it is probably a hybrid of Actinidia arguta and A. kolomikta. Several American growers have shortened this cultivar name to 'Anna,' a practice that is bound to lead to confusion since many will think they represent two different cultivars. These new Russian cultivars will require a few years of trial to determine how they differ from one another, and which will perform best in our climate.

Cultivating the Kolomikta Kiwi

Both vigorous and adaptable in its growth, kolomikta kiwi can climb to heights of fifteen meters (50 feet) in its native woodland habitat. Vines twine into the canopy of large shrubs and small trees, and then sprawl out across their crowns. The plant explorer Radde reported that the kolomikta kiwi thickets on the middle Amur were so thick that the forest was almost impenetrable. Barry Yinger, a contemporary plant explorer, reports finding this plant at high altitudes in northern Japan, in open woods of birch, spruce, and fir. It is an amazing experience, Yinger says, to encounter brightly colored leaves hugging the tree trunks in the shade of the forest. This provides us with a clue for using the plant in urban conditions. Imagine the columns used to support a porch or shed transformed into pillars of tricolored leaves.

In its native haunts, this forest plant remains in varying degrees of shade for most of the day. In dense shade, growth lacks vigor and the foliage of kolomikta kiwi stays green throughout the summer. At the edges of the forest, and near the top of the canopy where light levels are high, the distal tips of many leaves become suffused with the characteristic white and rose-pink. Yinger reports that variation in leaf color in natural populations offers future growers the opportunity to select individuals with leaf colors and patterns more distinctive than those now in cultivation. At present, the introduction of new cultivars from Japan is restricted because of Pucciniastrum actinidiae, a rust that infects plants in that country.

The vines thrive in full sun in northern areas, but as one moves south to areas with
longer, hotter summers, plants benefit from some shade. Best growth of kolomikta kiwi occurs on well-drained, fertile loam. Once planted, young vines usually require two to three years to get established before they produce either their tasty fruits or their colorful foliage. Several growers in the South have reported that the spring growth often breaks dormancy early, only to be cut back by frost. However, the plants resprout readily and are only seldom killed outright.

Where soils are heavy or drainage is poor, this plant becomes susceptible to phytophthora root rot. Mark Houston of the California Kiwifruit Commission reports that Actinidias are also susceptible to nematodes. Because Actinidias are shallow-rooted, they require mulching and supplemental irrigation during periods of drought. Actinidias grow best in acid soils with the pH between 7.0 and 5.0. The literature reports that roots are sensitive to fertilizers, and care must be taken with these chemicals.

Actinidia kolomikta is the slowest-growing species in the genus. In Massachusetts, annual growth is generally about one to two meters (three to six feet) with a maximum spread of three to six meters (ten to twenty feet) during a single growing season. Kolomikta kiwi also tends to produce a lighter structural framework than other Actinidia species, making it a good choice where growing space is limited or labor required for pruning is in short supply. This characteristic is useful to the gardener, for it allows one to construct a support structure that is more delicate and open in its detailing than those needed for most other Actinidias.

When the vine is grown primarily for fruit, it is better to set the plant on an arbor that one can walk beneath to facilitate the harvest. When grown primarily for foliage, kolomikta kiwi can be beautifully displayed on a lattice set directly against a wall or woven through a free-standing wire fence. It is also delightful when grown on a structure that can be seen from an upper-story window, allowing a clear view of the most brightly colored leaves.

Because of its exceptional hardiness and shallow root system, kolomikta kiwi deserves to be tested for use in containers on terraces and rooftops.

**Planting for Fruit**

For a fruit crop, gardeners need to keep in mind that this species produces both staminate (male) and pistillate (female) plants, and that both sexes are required for fruit set. To complicate the matter, some plants may occasionally bear flowers of the opposite sex while others are reportedly bisexual. Nurseries and fruit breeders have selected plants that are reliably male or female for more dependable crop production. A ratio of at least one
male plant to five to eight female plants is recommended to maximize fruit production. Bear in mind, however, that even in Manchuria, when both sexes are planted together in gardens, fruit set can be problematic.

While other Actinidia species have been known to pollinate Actinidia kolomikta, it is best to use a male of the same species so that both plants will flower at approximately the same time and there will be no sexual incompatibilities. Where multiple species of Actinidia have been grown together, both natural and artificial hybrids have been reported to occur. It is these plants that offer the promise of increased fruit size, yield, vigor, and more colorful foliage for the gardens of tomorrow.

In Massachusetts the flowers are produced in mid-May and stay in good condition for a week to ten days. The blossoms are white with dark-purple stamens, 1 to 1.5 centimeters across (1/2 inch), and are borne in clusters of one to five flowers. They produce a mild fragrance, similar to that of lily-of-the-valley (Convallaria majalis), and are largely hidden beneath the foliage. Flowering occurs only on wood produced the previous growing season, so pruning is required to reduce the buildup of older non-flowering growth.

In Massachusetts, kolomikta kiwi fruit matures in late August or early September, about one month earlier than Actinidia arguta. Depending on the cultivar, fruits range from the size of small grapes (1 to 1.5 cm) to that of a small plum (1.5 to 2.5 cm). They are smooth-skinned, bear a dark-green flesh, and have a taste more intense and flavorful than the commercial kiwis (Actinidia deliciosa) found in supermarkets. Because the fruits are smooth-skinned, they can be eaten without peeling—much as one would eat a grape. In Asia, fruits of Actinidia kolomikta are used for jams and jellies, are dried or salted; and are used for winemaking and as desserts and garnishes. According to Tanaka's Encyclopedia of Edible Plants, the Japanese also use the leaves in a variety of ways: they parboil them for soup, preserve them in salt, or use them as an ingredient in cooking.

People who are interested in learning or sharing the latest information about the genus Actinidia should consult the Actinidia Enthusiasts Newsletter, P.O. Box 1466, Chalan, Washington 98816. This publication is on file in the library of the Arnold Arboretum.

Bibliography


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