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THE RASPBERRY.

By

CHARLES P. CLOSE, '90.

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The very early history of the raspberry is shrouded in obscurity. The name <u>Rubus</u> from the Latin word <u>Rubeo</u> meaning "be red", was given it because of the redness of the twigs or of the juice.

Cato who lived about 140 B.C. wrote of it as one of the fruits thought by the Romans to be worthy of cultivation. Pliny, the Elder, 45 A.D., and Diascorides, 45 A.D., wrote that the Greeks traced its origin to Mount Ida in Asia Minor near the ancient city of Troy. They gave it the name <u>Idaeus</u>, hence the name <u>Rubas</u> <u>Idaeus</u>.Palladius mentions <u>Rubus</u> <u>Idaeus</u> as one of the fruits cultivated by the Romans in the fourth century Pickering mentions its being cultivated in central Europe during the mediaeval period; that it grew wild from the mountains of northern Italy to Lapland, and was carried to northeast America by European colonists .

In looking up the history and description of such a popular and favorite fruit as the raspberry, one is struck with the peculiarity of the early writings. These early English works are not common and as few people ever see them, it was advisable to quote John Parkinson in his Paradisus written in 1629.

Rubus Idaeus, Raspis.

"Two kinds, white and red. They do not differ in form of bush, leaf or berry, only in color and taste of fruit. Raspis bush hath tender whiteish stemmes, with redish, small prickles like hairs set around them especially at the first when young; but when they grow old they become more woody and firme without any shew of thorns or prickles upon them.

The leaves are somewhat tough, rugged, and wrinkled, standing three or five upon a stalk somewhat like unto roses, but greater and of a gravish-green color. The flowers are small, made of fine whitish round leaves, with a dash, as it were, of blush east over them, many standing together, yet every one **94655** upon his own stalk at the top of the branches; after which come up small berries, bigger than strawberries, and longer, either red or white, made of man" grains more emment than the strawberry, with a kind of downiness cast over them, of a pleasant taste, yet somewhat soure, and nothing so pleasant as the strawberrie. The white Raspis is a little more pleasant than the red, wherein there is a small deed inclosed. The roots creepe under ground very farre and shoots up againe in many places, much increasing thereby."

There is another whose swemme and branches are wholly without prickles; the fruit is red, and somewhat larger, and a little more sharpe!

The use of the raspberry at that time was medicinal. They were used in gargles and other decoctions that are cooling and drying." "The syrup made of the berries is used to sool a hot stomach, helping to refresh and quicken those that are overcome with faintness."

Steven Switzer in 1724 mentions only three kinds of maspberries. George W. Johnson in his "History of English Gardening" published in 1829, places the number of **a**ultivated varieties at twenty-three.

Gerard Dewes in his translation of Dodoen's "Niewe Herball", or Historie of Plants, published in 1578, the "verlues" or medicinal uses of the whole plant.

Not much attention was paid to the raspberry until the clos of the sixteenth century. About that time people turned their attention to the cultivation of fruit and the familiar varieties of England were introduced. William R. Brince, in his feen Pomological Manual of 1832, mentions only four, varieties, six of which are worthy of cultivation. Ten of these are probably varieties of Rubus Idaeus. Of the other four, three appear to be forms of Rubus Strigosus, while the fourth, may belong to Rubus neglectus.

Miller in his "Gardener's Dictionary", published in 1807 gives a detailed account of the Rubas from all parts of the world as it was then known. The raspberry and blackberry are

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not separated, but are described under the generic name <u>Rubus</u> with their respective specific names attached. There are thirty-two wild species minutely described, giving botanical characteristics and habitat, propogation and sulture.

For the purpose of comparing the <u>Rubus Idaeus</u> and the <u>Rubus occidentalis</u> of that time with the same species of the present time, Mr. Miller's description is given in full, as follows: "<u>Rubus Idaeus</u>. Stems suffruticose, biennial, upright, round, cente-bispid, or thick set with small prickles, ... feet high: they produce fruit the second year, after which they die down. Leaflets rhomb-ovate, acute, market with lines, unequally serrate, white undernoath. Petioles pubescent, prickly produncles bispid, calyx tomentose, auminate. Petals small, white, blunt, flat; fruit red, grateful to the smell and taste, deciduous, bristly with the permanent styles placed upon a conical receptacle. There are three of these varieties, the red-fruited, the white-fruited and the twice-bearing. It flowers in May or June. It is native of many parts of surope, on rocky mountaine, moist situations, woods and hedges."

"Rubus occidentalis. The Virginia raspberry, -- rises with purplish stalks, a little higher than the common sort. The leaves are of a lucid green on their upper side, but hoary on the under side; their foot-stalks are tapering; the fruit is of a deep black when ripe, has little flavor, and ripens late in autumn. Stem round, even, with recurved prickles, and covered with a bloom like a plum. The petioles have also recurved prickles. Leaves ternate, with the middle leaflet pedicelled, ovate, gash-serrate, white-tomentose underneath. Raceme terminating. Fruit black. It varies also with a red fruit, more acid and pleasant than our European raspberry. It differs chiefly from that, which it, otherwise, very much resembles, in the leaves being commonly ternate, although the lateral leaflets often become two; the lateral leaflets often being usually angular; the prickles alternate, recurved, not scattered and in clusters; but it is known at first sight by the blue cloud or blush on the stem."

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"Native of North America. It was cultivated in the botanic garden at Chelsea in 1698; flowers in May or June."

Propagation.

There are five ways of propagating the raspberry, namely, suckering, division, root-cutting, tip-rooting, and by seed.

Suckering is the natural way of propagating all the red species. It consists in the sending up of suckers, or young canes, from the underground root-stalks of the old plants. This growth occurs in the spring and the young plants may be transplanted during the summer if the weather is favorable, or in the following spring. To increase suckering in those varieties which naturally produce but few suckers the roots are cut into lengths of 3/4 inches by some instrument. The latent buds in these divided roots are thus forced to grow and produce good, strong, plants.

<u>Root cutting</u> is practiced with red varieties only and consists in digging the roots in the fall and cutting them into lengths of 2 or 3 inches. These cuttings are placed with damp sand in boxes and either buried in a dry pace below frost, or placed in a frost-proof cellar. The cut surfaces callus during the winter and when planted in the spring soon send out rootlets and shoots. These cuttings should be plant d in a rich sandy loam three inches apart in drills and covered two inches deep. It is well to put on a light mulch of straw to shade the surface and check evaporation. These plants can be transplanted the next spring.

<u>Tip rooting</u>. This is the means of propagating the black-cap varieties. The canes are usually long, slender and drooping, with the tips resting on the ground. When the tips remain stationary a few days new rootlets are formed and a bud is emitted at the surface of the ground. When the **t**ip is securely rooted the old cane is severed eight to ten inches above the bud. 5

Layering consists in digging a small trench, putting the tip in, and then covering with earth to facilitate the growth of the bud.

The last method, "by seeds", is used to produce new varieties. The best fruits from the most excellent varieties are carefully crushed, and the seed and pulp separated by washing. The seeds may be planted in the fall or preserved in sand until spring $\frac{1}{14}$ a seed bed should be carefully prepared and the seed sowed in drills one foot apart. If sown in the fall the seed will not germinate until the following spring. After the season's growth the plants should be heeled in for the winter and the next spring set out in the plantation. They will bear this season and the peculiarities of the varieties may be studied. If there are any new and promising varieties they may be propagated for future use.

Pruning.

The canes of the raspberry are biennial, making a growth the first year on which fruit is grown the second year. After producing one crop, the canes will die; so it is well to cut them out soon after the crop is gathered. The tips of the youg canes should be pinched back in $J^{u}ly$ so as to make them short and stocky giving more branches for the development of the fruit. In the spring the young canes should have the tips and lateral branches cut back. The canes are left three or four feet high accordind to the variety, and from three to five in hill. The branches are cut back for the purpose of making the bush more compact and stocky.

Planting.

Black-caps and tip-rooting kinds should always be set in the spring as they are apt to winter-kill. The suckering kinds may be set either in the autumn or spring.

After the soil has been thoroughly prepared, the plants

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are set in rows as far apart as the fancy of the grower dictates. About five or six feet apart for the rows and about four or five feet apart in the row is an average distance, in the hill system. In the row system the rows may be six to eight feet apart and the plants three to four feet apart in the row.

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Cultivation.

The ground should be cultivated often enough to destroy all weeds and suckers and to keep the surface mellow, thus forming a mulch to return the moisture of the soil. The hill system has the advantage in that it can be cultivated both ways and the weeds and suckers kept down with little or no use of the hoe. With the row system, cultivation is impossible except in one direction, and weeds and suckers must be cut with the hoe. If suckers have been neglected until June or July, they had best be pulled out by hand at that time and few will start again until the following spring.

Description of a few Species, And

Early Development of a Few Varieties.

Rubus Idayus. Linn. (European Raspberry)

This was at an early date cultivated in Southern Europe by the Greeks and Romans. From there it was taken to France and England, and finally to the United States. It is distributed quite generally over Europe, but in this country it is adapted only to limited area s owing to a lack of hardiness and inability to stand the hot summer sun.

Plant medium stout, 2 1/2 to 3 1/2 feet high, erect, covered with many straight, slender prickles, giving a reddish, fuzzy appearance. Leaves three to five lobed, wrinkled, dark green above, glaucous below, prickles extend along under side of mid-rib. Inflorescence sub-corymbose, pedicles short and

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and aggregated at end. Fruit large and broad, appearing more or less continuously throughout the summer, purple or yellowish. The varieities of this species lack in hardiness and although the fruit is large and of high flavor, it is so lacking in production and soft in texture that it is little grown for market purposes. It is highly esteemed by amateurs for home for use in localities where it succeeds.

Among the early varieties of this species is Brinckle's Orange which was originated in 1843 by W.D.Brinchle of Philadelphia. The seed from which it grew was obtained from the Dyack. The area over which it thrives is limited as it is damaged by both heat and cold. At present it is said to do well in thirteen states.

Russel's Red is a seedling of the White Antwerp supposed to have been fertilized by the Red Cane. It was first exhibited by Dr. Russel, of Hartford, in 1859.

Rubus occidentalis. Linn. (Black-cap).

Plate I. This species is indigenous to nearly the whole of the United States and Canda, except perhaps on the Rocky Mountains and along the Pacific coast. About 1850 it bagan to be cultivated in the Eastern states and many good varieties have since been developed from it.

The stems are long and drooping, rooting at the tip, glaucous at base of shoots, prickles stout and hooked, leaves 3lobed, smooth, dark gree above, glaucous below. Infloresconce densely cymose. Pedicles aggregated, usually, stiff and erect bearing stiff prickles. Petals shorter than sepals, fruit black, depressed, firm, and dense.

The varieties from this are largely grown in the northern States. They are good shippers from the fact that they have large seeds and a small amount of juice. For this reason, it is largely used for evaporating.

The earliest variety of this species is the Ohio Everbearing developed about 1832, somewhere in northern Ohio. The peculiar feature of it was that it bord fruit in the autumn on

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the current year's growth of canes. It has been cultivated in the eastern states in the family garden, but not much for market purposes. The fruit is large, gray-black, and rather early. 9

The Doolittle was found growing wild by Leander Joslyn of Phelps, Ontario County, N.Y., and introduced by H.H.Doolittle of Oaks Corners about 1850. A peculiar reason claimed for its excellence is that it was propagated from tips of one-year old plants only.

Rubus strigosus. (Red raspberry). Plate II.

This species is found to be a native American species. It has a little wider range than the black-cap as it extends much farther northward. Its greatest natural development is attained in the vicinity of the boundary between the United States and Canada. It does not take kindly to cultivation and most of the varieties from it are chance or artificial seedlings upon cultivated ground.

The plants are tall, stout and much branched. Prickles nmmerous and stout except at the base where the vare numerous and slender. Leaves slightly wrinkled, generally 5-lobed on new canes and three lobed on the old ones, dark green above, light green below. Inflorescence raceme, pedicles scattered, either simple or three flowered, pedicles short with a few reddish, recurved prickles. Petals as long as sepals, fruit light red.

The varieties of this species are now almost entirely grown for market purposes taking the place of the <u>Rubus</u> <u>Idaeus</u> which are now only grown for family use. They are generally hardy and the better varieties productive and good shippers.

Among the early varieties, we have the Turner origijated about 1834 by Prof. J.B. Turner of Jacksonville, Illinois. It was grown from seed of the Red Antwerp. The Turner was the leading red variety from 1877 until the Cuthbert appeared in 1887. It is very hardy, being adapted to the cold of the north

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as well as to the heat of the south. The Stoever is a form of American Red found wild near Lake Dunmore in Vermont, by Jefferson F. Stover, and removed to his garden at Tacony, near Philadelphia, where it fruited in 1859.

A later variety and the leading red, is the Cuthbert originated in the garden of Thomas Cuthbert, of Riverdale, N.Y., about 1875. It is adapted to the most diverse situations, is of large size, firm texture, good color, and excellent flavor a and a splendid market berry. Itschief defect is that it settles in the shipping boxes if allowed to get over-ripe in hot weather.

Rubus noglectus. Peck. Purple cane family. Plate III.

This is supposed to be a hybrid of natural origin between the native red and black species and is quite generally distributed throughout the northeastern states. The plants are vigorous and often more productive than either the black or red species. It has been grown under the name of purple cane in the vicinity of New York, Philadelphia, and other cities, since about 1800 thus being the first American variety cultivat ted. For fifty years the blue cane was one of the favorites in a large portion of the country.

Plant, habit varies, part of canes grow upright, others curve over and root at the tip, glaucous, reddish-brown bark, becoming rough on old cames, stout, recurved prickles. Leaves 3-lobed, much wrinkled, dark-green above, glaucous below, prickles on under side of midrib. Inflorescence racemose-cymose, peduncles short with a few prickles. Pedicels short, erect and aggregated above. Fruit is large and broad, purple-black to bright purple, or even yellowish.

The fruit is covered with a brownish bloom, is very soft and inclined to crumble and has a peculiar acid flavor. It is largely grown for eastern markets, but is too soft to be a good shipper.

Perhaps the earliest cultivated variety from this species

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is the Purple Cane. Dr. Warder says its origin is unknown, but it has been cultivated for fifty years near the large eastern cities. For some time it furnished nearly the whole supply for the New York City market. It has now given way to better varieties. 11

A more recent variety is the Schaffer which was originated by, or rather was found growing in the Garden of George Schaffer of Scotsville, Munroe County, New York., about 1869. This is a very popular variety for both market and family use, being especially valuable for both canning and drying.

Description (Botanical) of Varieties.

Cuthbert. Rubus strigosus. Plate IV.

Plant tall, 4 to 5 feet, very stout, much branched, light green while young turning brown with age, slightly glaucous. Prickles guite numerous and stout except at base where they are more numerous and slender, 2--3 mm. long. Leaves alternate, very slightly wrinkled, ribs prominent on under side, generally 5-lobed on the new canes and 3-lobed on the old ones, but verying greatly, Sometimes 7-lobed, dark green above, light green below and slightly tomentose under the lens. 15--24 cm. long, 14--19 cm. wide on main stem. Much smaller on the branches. Stipules slender, flattened, slightly tomentose, larger on the lower branches, 5--15 mm. long largest 1 mm. wide. Petiole cylindrical, slightly glaucous, few prickles, 4.5---8.5 ch. long. Leaflets large, double servate-dentate, usually five, often three or seven, sessile, ovate base, acute apex, plicate in bud, Bracts on branches, usually only one, d veloped into small leaves with stipules. Inflorescence, cymose panicle. Peduncle cylindrically 5-sided, slightly glaucous, few prickles, several leaf-like bracts in the axils of which are flower clusters of from one to four buds. Bracts, several, nearly all developed into to 3-lobed compound leaves. Pedicel slender, cylindrical, few reddish redurved prickles, 10--15 mm. long, slightly tomentos -

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: . on the upper side, darker green and slightly pubescent with an occasional prickle below, vary in size on account of extra sepals, normal size, 3--4 mm. wide, 6--7 mm. long. Petals, 5--11, usually only five fully developed, white, blade elliptical, mea dium long claw, alternate with sepals in normal condition. 2.5 to 3 mm. wide, 5.5 to 7 mm. long. Stamens white tunning brown, perigynous, three lengths, with longest outermost, introrse, 2.5-4.5 mm. long. Filamant persistent, cylindrical, tapers toward top. Anther 2-celled, introrse, versatile, dehisce inward longitudihally. Ripen at different times. Pistil 3 to 3.5 mm. long. Ovary one-celled, green, covered with white pubescence on upper side. Style, cylindrical, persistent, white, turning brown with age. Stigma capitate. Fruit red, 10--16 mm. across at base. LO--16 mm. from base to apex.

Marlboro. (Idaeus & strigosus)

Stem, medium height, stout, light green when young, turning brown with age.

Prickles. Very few, short, stout, straight, 1--1.5 mm. long on upper half of stem. On lower half, many, weak, slender, reddish, recurved. 3--4 mm. long. Scarcely none on old canes.

Leaves. 5-lobed with some variation. Much wrinkled, well ridged dark green above, lighter green and slightly glaucous below, under a lens slightly tomentose. Axillary branches just appearing (June 17), 10--18 cm. long, 11--14 cm. wide.

Stipules. Very weak and stender, flattened, slightly tomentose 8 to 10 mm. long.

Petiole. Nearly cylindrical, slightly flattened on top, 3.5 to 7 mm. long. Few prickles.

Leaflets large. Irregularly servate, usually 5 sometimes 3,

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sessile, ovate base, acute apex, plicate in bud.

Bracts. None on stem.

Inflorescence irregularly cymose-panicle, 7--15 cm. long.

Peduncle cylindrically 5-sided, scarcely no spines, 5--10 cm. long, several bracts in axils of which are flower clusters of from one to five buds.

Bracts on peduncle. Sometimes 8--10, usually less, lower ones developed into compound leaves, upper ones simple lanceolate leaves.

Pedicel cylindrical. Larger at fruit end, few small reddish recurved prickles, very slightly tomentose, 5--15 mm. long

Bud ovate, base 6/5-sided. Pyramidal apex, slightly tomentose with occasional prickles.

calyx, monosepalous, 5-lobed, imbricated, persistant, slightly tomentose, occasional prickle.

Sepals, five in number. ovate, aute, light green and slightly tomentose with an occasional prickle, 3--4 mm. wide, 7+-8 mm. long.

Petals five in number, white, hypogynous, alternate with sepals, deciduous, blade ovate, with short thick claw. 4.5 to 5 mm. long, 2.5 mm. wide.

Stamens, numerous, perigynous, three lengths, longest outermost, 2.5 to 4.5 mm. long. introrse.

Filament. White, while young turning brown with age, cylindrical, tapering toward top, persistant.

Anther two-lobed, dehisce inwards longitudinally. Versatile ripen at different times, outer ones ripen first even before the bud opens.

Pistil, compound.

Ovary, green, one-celled, upper side covered with white pubescence.

Style white, turning brown, thread-like, cylindrical. Stigma capitate.

Fruit red. 11--15 Mm. across base, 11--17 mm. from base to apex.

Hansell. Rubus strigosus. Plate VI.

Plant. Medium neight, 2--4 feet, slightly glaucous on new growth.

Prickles. Numerous, especially on lower part of cane, quite stout, slightly recurved, green near the base, and red at tip. Becomes red with age. 2-4 mm. long.

Leaves. considerably wrinkled, dark green above, light, side Le somewhat tomentose. 11 to 18 cm. long, 6.5 t 14 mm. wide except small, undeveloped leaves, 5-lobed when fully developed but varying much.

Stipules very tender, terete, recurved, 5 to 10 mm. long on leaves of main stem, on branch leaves much smaller, slightly tomentose.

Petiole cylindrical, many prickles, 4--10 cm. long.

Leaflets large. Irregularly doubly servate-crenate, usually 5, sometimes 3, sessile, cordate at base, plicate in bud.

Bracts, vary much. Some simple, others developed into

leaves, simple ones 7--8 mm. long; others as much as 45 mm. long Inflorescence, irregular panicle, 8--12 cm. long.

Peduncle. Cylindrical, covered with spines 4--8 cm. long, several bracts. in axils of which are flower clusters with three or four buds.

Lower baacts developed into compound leaves with three leaflets, upper ones into single lanceolate leaves.

Pedicel, slender, cylindrical, covered with many recurved red spines. 10--35 mm. long.

Bud, ovate at base, 5-sided pyramidal apex, covered with small red spines. 4--5 mm. wide at base, 7--12 mm. long.

Corolla, polypetalous.

Petals. Five, white, hypogynous, alternate with sepals, oval, deciduous, blade large, claw short, 4--5 mm. long. 2 to 2.5 mm. wide. Stamens numerous, perigynous, 3 lengths with longest outermost, introrse. 2.5 to 5 mm. long.

Filaments white turning brown, persistant, tapering toward the top.

Anther 2-lobed, cohiscing invard longitudinally, versatile, ripen at different times, outer ones on longest filaments usually ripen before bud opens.

Pistil, compound.

Ovary, green, one-celled, covered with white pubescence. Style, while, turning brown, taread-like, 4 am. long. Stigma 2- lobed.

Fruit red 11-17 mm. across base, 10--15 mm. from base to base.

Lovett. Rubus occidentalis. Plate VII.

Plant tall, 4 or 5 feet, stout, slightly glaucous while young.

prickles few and quite stout on upper part of cane, many and weak on lower end near ground. Slightly recurved, 3.5 to 4.5 mm. long.

Leaves quite smooth, little wrinkled, dark green above, light green to glaucous green below, under a lens somewhat tomentose. 10 to 21 cm. long; 10 to 18 cm. wide. 3-lowed.

Stipules. Terete, erect, glaucous, 8--14 mm. long.

Leaflets, three, large, doubly serrate-dentate, sessile, cordate at base.

Inflorescence, densely cymose.

Pedicals, minute prickles, bractlets. 2 to 5 mm. long. 2 to 3.5 mm wide.

Petals, hypogynous, white, spatulate, kut varying considerably, deciduous, rather long claw, usually 5, sometimes 6,8 or even 10. 4--5 mm. long; 2mm. wide.

Stamens, numerous, perigynous, 3 lengths, introrse.

Filaments, white while young, tapering toward top, 1--3 mm. long.

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Anthor, 2-lobed, dehiscing inward longitudin 11y, ripens at different times. Outer whorl ripens before bud is opened. Pist 1, compound.

Style, whitish green turning brown, 2--3 mm. long.

Ovary, one-celled, covered with white pubescence which at upper end forms a tuft.

Fruit, black-cap. 10--15 across base. 9--12 mm. from base to upex.

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2. Herbarium Agricultural College, Mich. Plate II Rubus strigasus Variety Hausell. Grown in Cally garden. June 13, 1898 cpelose





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