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STUDIES OF THE GENUS RUBUS FROM
AN ECONOMIC STANDPOINT

Thesis for the Degree of M. S.

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A THESIS
FOR THE DEGREE " MASTER OF SCIENCE "
COMPRISING STUDIES OF
THE GENUS RUBUS
FROM AN ECONOMIC STANDPOINT
BY
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THE GENUS RUBUS.

Generic
Character-
istics.

The species of this genus are herbs with a perennial stock or weak, scrambling, prickly bi-ennial shrubs; bearing edible fruit; pinnately or palmately divided leaves,

The plants have a free calyx of five lobes, five petals and numerous stamens. The fruit consists of a granulated berry formed by the union of numerous one-seeded succulent carpels around the conical or shortly oblong spongy receptacle. Inflorescence is either racemose or corymbose, on short lateral or terminal spurs of the newly formed growth.

The blossoms appear in May and June, while the fruit ripens from the last of June to the first of September.

The species of this genus are propagated either by root cuttings, tip layerings or by suckers.

st Species
R. Idaeus.

The first species to command attention is *Rubus Idaeus*. From this all our European varieties of raspberry have sprung. *R. Idaeus* has stiff erect canes of a

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Specific
Character-
istics.

light brown color, and covered with straight slender
bristles, the leaves are three or five foliolate leaflets
rhombovate acuminate, hairy beneath, and deeply serrate;
the lower surface is much lighter colored than the upper.
Inflorescence sub-corymbose, pedicels short and aggregated
at the upper end of the cane; petals white and shorter
than the sepals; fruit large and broad, of a red or
yellowish white color, and appearing more or less con-
tinuously throughout the summer. The specific name
Idaeus was derived from Mount Ida- this name being given
it by the Greeks. It is cultivated very sparingly
throughout the Northern states because it is not suffi-
ciently hardy to withstand cold winters. The varieties
cultivated here are largely for home use, and consist of
the Red Antwerp, White Antwerp, Belle de Fonteny, Franc-
onia and Herstine.

Varieties.

Antwerp.

The Red Antwerp is an old variety seldom cultivated
at present in northern gardens. It ripens in July, is

used only for the family supply; it is of a large nearly globular form, dark red color with bloom; granules large, juicy, sprightly flavored. Canes strong, four to five feet tall, bristles light red and numerous; it is too tender for our winters; where winter protection is given it yields well.

White
Antwerp.

The White Antwerp is cultivated to a limited extent here; it ripens its fruits during the latter half of July. It is used for dessert purposes only. The fruit is large and flattened somewhat; it is of a yellowish white color, granules large and loosely compacted, juicy and fairly good.

Canes are upright, growing only two or three feet high, covered with light colored straight bristles. This also is too tender for general cultivation, but will yield well if given winter protection.

Belle de
Fontenay.

Belle de Fontenay ripens its fruit from July 10th to the end of the month. It is cultivated in gardens for

family purposes; is a spherical, medium sized, dark red berry with rather large, closely set granules and excellent flavor. The canes are upright growth about two or three feet high and bear numerous short, straight bristles of a brownish color. It is a tender variety although hardier than the Antwerp, and is very productive, sometimes giving a second crop in autumn.

The Fran-
conia.

The Franconia ripens its fruit late in July. It is raised for both family and market purposes, is an obtuse conical berry of a dark purplish red color, closely set granules firm and has a sprightly flavor.

The canes are strong, upright and branching, bristles scattering, stout and of a purple color; to produce a good yield the vines require winter protection.

Herstine.

The Herstine is the last variety of this species worthy of mention for northern growers. It matures its fruit from July eighth to the end of the month; it is therefore a few days earlier than the average, and is

used for family purposes mainly. The berries are crimson red with bloom; the granules are small and compact, flavor excellent, and it is a good yielder.

Canes are upright, about two or three feet high and of a light color, ususily covered with bloom. Bristles green, short and scattering. The plant is moderately hardy and worthy of a place in every garden.

2nd Species,
R. strigosus

The second species, *Rubus strigosus*, is very widely disseminated throughout the American continent. It is the wild Red Raspberry so common in our fence rows and swamps.

Compared
with
R. Idaeus.

It closely resembles the European species in many respects, but it is, however, a much hardier plant and is found growing wild under greatly varying climatic conditions. The fruit is tender and somewhat watery, but the flavor is fine.

Specific
Character-
istics.

The canes are slender and erect clothed with straight, weak and numerous light brown bristles, disappearing gradually in the cultivated varieties; the leaves are

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three or five foliolate oblong or oval leaflets, obtuse at base, hairy and light colored beneath. Inflorescence racemose ~~racemose~~ upon newly grown lateral and terminal spurs, peduncles slender and drooping, either simple or two or three flowered, not aggregated at the top of the cane.

Petals white, as long as the sepals, fruit light red variable in size but usually small and rich flavored. Granules closely compacted, watery, and each provided with a wavy bristle.

The specific name *Strigosus* signifies covered with strigae, i.e. hairs.

The number of varieties derived from this species is increasing annually, as gardeners are coming to see the immense advantage in hardiness which they possess over foreign varieties. There can scarcely be a doubt that if the same persistent efforts were put forth to improve our native Red Raspberry that have been lavished on foreign

ones, we would now have a great number of varieties far superior to those from abroad.

Cuthbert. Of the varieties now in cultivation only a few are suitable for market berries because they are so soft and watery. Chief among the exceptions to this rule is the Cuthbert. It was originated by Thomas Cuthbert of N. J. and had recently been widely disseminated. It ripens from July 15th to the end of the month and is a general favorite for both home and market use. The fruit is large, conical and of a bright red color. The granules are large, closely set and hairy; berries of a sprightly, agreeable flavor, very juicy and very solid; canes stout, upright, of a reddish brown color and about four feet high; the bark often presents a cracked surface and is scantily covered with weak, straight bristles. The canes often branch and by heading in are made to send out numerous lateral shoots which greatly increase the number of bearing spurs; they are very hardy and produce a

large crop of fruit.

Turner.

Next to the Cuthbert in desirable qualities we would place the Turner. This berry ripens from July 10th to the 25th and is suitable for both home and market purposes.

Fruit conical, of a bright red color, granules small and closely set, juicy and well flavored. The canes are upright, of a brownish color, about four feet high and are scantily clothed with straight brownish bristles. They are quite hardy and yield well but the fruit is soft and watery when fully ripe.

GOLDEN
Queen.

The Golden Queen variety, although of a yellowish color, is classed as a descendant of *R. strigosus*, having upright stalks and straight yellowish-brown bristles. It ripens from July 11th to the end of the month; it is used chiefly for dessert purposes; is long and conical in form, cream colored with bloom, granules closely set and has a rich spicy flavor. It is a hardy vine and very

productive.

Marlboro.

The Marlboro ripens from July 10th to the 24th, is a good family and market variety; large, oval in form and of a bright red color. The granules are large, but closely set and very solid and the berry is of excellent flavor.

Canes scanty in size and reclining so that they stand only two and one half feet high. Bristles scanty, of a reddish brown color and straight. The vines are not very hardy and yield only an average crop.

Kirtland.

The Kirtland is a desirable variety because of its earliness. It ripens as soon as July 10th and lasts until about the 20th. It is cultivated for family use only, as it is too watery for shipping. Fruit cone shaped, of a bright red color, granules closely set, sweet, closely resembling in flavor the wild species.

The canes are upright, about three feet high, having a brownish rough bark clothed with a scanty covering of straight bristles. Vines hardy and productive.

Common chara-

teristics of

. *Idaeus* &

. *strigosus*.

The two species *R. Idaeus* and *R. strigosus* form a group of plants which differ from the other species in the fact that they propagate wholly by root cuttings or suckers, while the other forms of Raspberry propagate most readily by tip layers.

rd Species

. *neglectus*.

The third species, *Rubus neglectus* P, has often been grouped with *Rubus occidentalis*, which follows it, but

good authorities now affirm that it constitutes a species by itself with characteristics sufficiently well defined

to warrant its separation. The varieties constituting it

are not supposed to have a common origin either on this

or the other side of the Atlantic. Its habit is exceed-

ingly various, consisting of garden varieties that do not

properly fall under either of the other species. Its va-

rieties are generally hardy and vigorous growers. The

characteris-

es.

fruit consists of large grained watery berries varying

in color from purple black to bright purple or even yellow-

ish. The stems, in typical forms, are long, recurved,

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and rooting from the tips; they are usually glaucous and provided with more or less bristles of a hooked nature.

Inflorescence racemose-cymos, the peduncles short and prickly, mostly stiff, upper ones erect or ascending, symmetrical above but unequally branched below; some of them aggregated above. The varieties of *R. neglectus* in general cultivation are quite limited and only Shaffre's Colossal, Gladstone and Caroline are worthy of much attention.

Varieties.

Shaffre's

Colossal.

The Shaffer's Colossal ripens from July 10th on to Aug. 5th and is used both as a family and market berry. It is oval in form, somewhat flattened, of a dark purple color with bloom, the granules large and inclined to be loosely compacted, of a peculiar foxy taste. Canes are drooping, from three to four feet high, bristles slightly recurved, few and stout, of a purplish color with bloom on the canes. This is a hardy variety yielding large crops.

Gladstone.

The Gladstone ripens its fruit from July 1st to the 25th. It is raised chiefly in gardens for family use, and is of a flattened spherical form, purple color with bloom, the granules large and loosely compacted, the flavor foxy and objectionable to many until they learn to like it. The canes are upright, slightly recurved and about two feet high. The bristles are few and short, and the bark presents a peculiar cracked appearance. The Gladstone is a tender variety and yields well only when protected during winter.

Caroline.

The Caroline ripens its fruit from July 10th to the 25th and is used chiefly for dessert. It is oval in form of a yellowish-brown color, granules loosely compacted, and it has an agreeable flavor and sweet taste. The cane are vigorous, upright, recurved, and about three and one half feet high, covered with light brown, recurved bristles. It is very hardy and yields well.

R. neglectus with *R. occidentalis* and *R. Canadensis*

are propagated by tip layers only.

th Species.

R. occiden-

alis.

The fourth species, *Rubus occidentalis*, L. or Black-cap, is confined wholly to America. It is most common from Virginia north and westward, and its several varieties bear a pleasant tasting fruit in great abundance, with little or no care. Its stems are long at maturity, and recurved tending to root at the tips, as this is the only means of propagation except by seeds; the stem is glaucous, armed with stiff recurved bristles. Leaves pinnately

Specific Cha-

acteristics.

three foliate, leaflets ovate acuminate, light colored beneath.

Inflorescence densely cymose, the peduncles all aggregated near the topmost part of the cane and bearing stiff prickles. Petals shorter than the sepals, white; fruit depressed, firm, dense and black, separating from the dry conical receptacle as do also the preceding species.

Varieties.

The varieties most worthy of cultivation are Gregg,

Ohio, Souhegan and Hilborn.

The Gregg ripens quite late and on this account should be cultivated along with the Souhegan one of the earliest sorts.

Gregg.

The berry is large, flattened and black with bloom; it ripens about the 15th of July and lasts into August. It is valuable both for home and market use. The granules are very closely set and the berry of an excellent flavor.

Canes upright recurved, about three and one half feet high, having a purplish bloom and stout hooked bristles. It is a hardy variety and its productiveness is increased by the young canes frequently bearing large clusters of excellent fruit at their upper extremities.

Ohio.

The Ohio is next to the Gregg in desirable qualities. The fruit ripens from July 10th on to the end of the month. It is used for family and market purposes, is of a flattened spherical form, black with bloom, good sized

granules closely set, with excellent flavor. The canes are upright, recurved and about three feet high. Bristles are few, stout, recurved; bark is covered with a purple bloom. Plants are vigorous and hardy and good yielders.

Souhegan

The Souhegan is especially desirable to cultivate as an early blackcap variety. It ripens from July 5th to July 20th and is excellent both for family and market use. It is of a flattened spherical form, black, granules closely set, very solid and juicy and of excellent flavor.

The canes are upright, recurved, about two feet high, bark covered with purple bloom and clothed with a few recurved stout bristles. It is hardy and a good yielder.

Hilborn.

The Hilborn ripens soon after the Souhegan and lasts until July 20th. It is a good variety for family or market use, of an oval form, granules compact, black with whitish bloom, juicy and sweet. The canes are upright, straight and spreading, about two and one half

feet in height. Bristles are numerous, purple bloom, and a hardy vine. It yields a fine crop with good care and well drained soil.

th Species
t. villosus.

The fifth species, *Rubus villosus*, Ait., is the High Blackberry found almost everywhere, in fence rows and forest openings. The stem is shrubby, from two to eight feet high, grooved, upright and beset with formidable recurved spines. Its roots spread rapidly and propagate by suckers or root cuttings very freely. Leaflets three to five, ovate, acuminate, serrate, petioles prickly. The plant varies greatly in size. Inflorescence racemose, raceme leaflets a sort of spur, both lateral and terminal, many flowered, bearing elongated oval berries. Petals longer than sepals and conspicuously large and white.

Specific
character-
istics.

Fruit granular, the grains usually closely set and clinging to the small pithy receptacle; when picked this breaks off with the berry.

Varieties.

The varieties of Blackberry are not numerous, as it has only been admitted to garden cultivation for a few years and is still undergoing rapid improvement.

The most attractive varieties are Taylor's Prolific, Early Wilson, Snyder, Ancient Britton and Minnewaski.

Taylor's
Prolific.

Taylor's Prolific ripens from July 25th to the end of August. It is an attractive berry both for family and market use; in form it is elongated, oval, shiny black color, medium size, granules thickly set, solid, juicy and sweet. The canes are of stout upright growth, somewhat grooved, beset with sharp, stout recurved bristles. It grows three or four feet high, has a greenish brown bark, is hardy and a good yielder.

Early
Wilson.

The Early Wilson ripens its fruit at nearly the same time as the Taylor and is grown both for family and market use. Berry is elongated conical, shiny black, granules closely set, flavor excellent.

The canes are stout, large and thorny, but are best

managed when trimmed to three or four feet high; the bark is brownish and the canes very hardy and productive. Fruit on numerous short spurs in a loose panicle.

Snyder.

The Snyder is a little later than the foregoing, and ripens from August first to the end of the month.

It is a family and market berry, elongated conical, shiny black, with thickly set granules, the fruit of medium size and excellent flavor.

The canes are medium sized, from three to four feet high, having greenish recurved bristles. The fruit in this variety is abundant, and in loose panicles near the upper end of the canes.

Ancient

Britton.

The Ancient Britton ripens its fruit from July 28th on through August. It is cultivated mainly for family use, as it is not quite so productive as those already described.

Fruit elongated, shiny black, granules large and compact, of a rich flavor and very sweet and juicy.

Canes stout, three feet high, grooved, brownish spines straight and numerous. It is a hardy variety and fair yielder.

Minne-
waski.

The Minnewaski is cultivated as a late variety, ripening its fruit from August 10th on through the month. It is for family or market use; elongated conical, of a shiny black color and rich flavor. Canes smaller than many others but vigorous and straight, grooved, of a greenish brown color, having numerous recurved bristles; hardy and a good yielder when not affected by drouth.

6th Species
R. Canaden-
sis

The sixth species, *Rubus Canadensis* is the Northern Dewberry, or trailing blackberry.

Specific
Character-
istics.

Canes slightly prickly, of a greenish color and not sufficiently rigid to support itself. Leaves three foli-
ate, leaflets elliptical or rhomb-oval, acuminate, thin;
pedicels long, in loose panicle. Fruit large and sweet,
about two weeks earlier than the blackberry. The only
varieties worthy of cultivation are the Everett and

Varieties.

Lucretia.

Everett.

The Everett ripens its fruit about July 20th and may be classed as a family berry. Granules large and loosely set, making an irregular shaped berry, shiny, black, sweetish, juicy and seedy. Vines trailing, greenish brown beset with small recurved bristles. Fruit on single pedicels in a loose panicle. A hardy vine yielding moderately well.

Lucretia.

The Lucretia ripens its fruit about the middle of July and is valuable as coming between raspberries and blackberries and also for southern growers, where the High Blackberry will not succeed. Fruit long, conical, shiny black, granules large but somewhat loosely set; berry juicy but somewhat foxy, especially if grown in the shade. Canes trailing three or four feet long, having green bark beset with many slightly recurved bristles; It is hardy and productive.

7th Species.
R. cuneifo-
lius.

The seventh species, *Rubus cuneifolius*, Pursh. or Sand Blackberry, is one of the more common species growing from two to three feet high and ripening an abundance of

Specific
Character-
istics.

well flavored fruit in August. This species is found along the eastern seaboard and has pubescent three foliate leaves, leaflets wedge ob-ovate, entire at base, dentate at tip. Flowers in loose few flowered racemes, with white showy petals. The varieties of this berry are not common in northern latitudes.

8th Species.
R. Chamae-
morus.

The eighth species, *Rubus Chamaemorus*, L., or Cloud-berry, is found growing on the White Mountains and also in Lapland. It has a decumbent stem, only one foot high, smooth one flowered pedicles and leaves in pairs having five rounded lobes, serrate, inflorescence white, showy, fruit large orange-red; plants propagated by root cutting.

General re-
marks on
cultivation.
Deep culture.

These eight species constitute the most useful part of the genus *Rubus* and furnish a large share of our garden fruit in great profusion and variety. The soil best adapted to their cultivation is a dark sandy loam deep and rich. In the preparation of the soil for growing berries very thorough and deep plowing and pulverization is desirable. It is a well established truth in

) horticulture that we can materially lessen the effect of a long drouth in drying up immature berries by deep culture at the time of planting.

Fertilizers. The soil should not be lacking in fertility and this is best supplied by applying stable manure or bone dust in the bottom of the pits before the plants are set.

However, much may be done to enrich the soil by applying the fertilizer to the surface along the rows and then Clean Culture working it in by cultivation. Clean culture at all times is very helpful in tiding over a drouth, as well as in the increased yield.

Rows. Berries should always be kept in straight rows far enough distant for horse culture. Red Raspberries may be grown readily with rows four feet apart and plants two or three feet apart in the row. Blackcaps should be six feet between the rows so as to give room for the strong vigorous, recurved canes.

Blackberries should be eight feet between the rows, with plants four feet apart.

) Pruning.

As the canes are all bi-ennials, the bearing canes should be removed every season after the crop is harvested, or at least as soon as the following spring. While this is being done, indeed while the fruit is being gathered, the growth of the new canes for the next year's fruitage should be carefully inspected.

Red Raspberries being propagated generally by suckers, only a sufficient number need be left to supply the place of the dying ones. These can be materially strengthened by heading in; side shoots are also thus encouraged. Stakes and other supports can generally be rendered useless by attending to the pruning of the growing canes at the proper time.

Mulching.

Another matter that is beginning to command the attention of fruit growers is mulching the vines just before the drouth begins to take effect on the ripening fruit. A thorough cultivation of the soil the last of June followed by a good mulch of straw would doubtless do much to

) prolong the fruiting season, especially of blackcaps and blackberries.

Propagating. As to propagating the different species of Rubus, the matter has already been incidentally touched upon. Red Raspberries are commonly propagated by transplanting the suckers that spring up freely about the old stool. This transplanting may be done either in the fall while they are yet green, or the following spring. In either case they should not be allowed to bear the first year after planting, but the new canes should be cut back so as to give much of the sap to the growing shoots which are to bear the fruit the second year.

Propagating Blackberries Blackberries are treated the same as Red Raspberries and should have the young canes cut back to, at most three feet in height. All unnecessary suckers should be treated as weeds and kept from developing; especially is this true with Blackberries, which, if left to themselves will very soon form a dense hedge of worthless

briers.

Propsgating

Blackcaps.

Blackcaps, and all those berries which are propagated by tip layers, need less care during the growing season. They will be made self supporting by heading in and will also be made to throw out lateral branches to increase the bearing area for the next year. If new plants are desired, it is only necessary to allow the old canes to recline and bury their tips in loose soil. The number of new plants can be readily increased if the lateral branches are bent over and their tips buried in loose soil also. The new vines, like those of Red Raspberries, should not be allowed to bear until the second season after transplanting.

Tender

Varieties.

Some of the species of *Rubus Idaeus* can be grown with large crops of superior quality of fruit in this country, by laying down the canes late in autumn and covering them lightly with soil. The covering should be removed and the canes straightened up before the buds start

in the spring.

Duration of
Plants.

The duration of plantations devoted to raspberries or blackberries will depend much upon the fertility and culture of the soil and upon the care exercised in pruning and keeping the suckers evenly distributed along the rows

Different varieties will doubtless endure for varying terms of years, but there is nothing to prevent our gathering profitable crops for from ten to twenty years on the same plantation if the foregoing precautions are observed.

Adaption to
locality.

The amateur in berry culture needs to study the nature of the soil and climate he intends to use as this has much to do with success. No variety should be extensively planted until tested and found to be both hardy and productive.

The experiment station and its various sub-stations are now being found very reliable sources of information upon adaptability, and each fruit grower should, as far

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as practicable, rely upon his own carefully tried experiments.

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