BRAMBLES(blackberries & raspberries)

SYMPTOMS	POSSIBLE CAUSES	CONTROL AND COMMENTS
Plants wilt; leaves turn yellow at bottom of plant	-Dry soil	-Supply water
	-Water-logged soil	-Improve drainage
	-Root knot (nematode problem)	-Rotate; soil fumigation
Ripening berries covered with tufts of gray, green, white or black moldy growth	-Fungal fruit rot (any of several)	-Use registered fungicide pick berries regularly and immediately
White or tan spots with purple borders appear on canes; canes die	-Anthracnose (fungal disease)	-Use registered fungicide in early spring and fall; prune out old canes
Leaves curl downward leaves smaller than normal; internodes shorter than normal	-Leaf curl (virus disease)	
	-Aphids	-Look for clusters of small gray insects on undersides of leaves; control with registered insecticide
	-Herbicide injury	
Blister-like reddish orange pustules develop develop on lower leaf surfaces	-Rust disease (fungal disease)	-Resistant varieties; remove and destroy affected plants; remove nearby wild brambles

Insects feeding inside cane	-Cane borer	-Sanitation; destroy infested canes

A SMALL-SCALE AGRICULTURE ALTERNATIVE

BRAMBLES

Few crops are as well suited for small-scale agriculture as the brambles--raspberries and blackberries. Significant production can be achieved on just a few acres and berries are in great demand, not only for fresh eating but for desserts, jams and jellies, and wine.

Raspberries and blackberries are very high in fiber, vitamin C, phosphorus, potassium, and magnesium and have more calcium than any other temperate fruit.

Exquisite flavor, high nutritive value, and an exotic image push brambleberry prices to $1 per half pint in rural areas and $5 in urban centers. With yields of about 5,000 lbs. per acre, a gross return of more than $13,000 per acre can be realized even with the lower price.

A wide variety of brambles includes summer-bearing red raspberries (fruiting occurs on second year canes), first to market--usually in late June or early July. Next are black and then purple raspberries. Blackberries (including Loganberries and Boysenberries) and blackberry-raspberry hybrids (e.g., Tayberries) ripen from late July through August.

Finally, from late August through frost, red raspberries are again available from varieties that produce on the tops of first year canes. A few raspberry cultivars have yellow fruit.

In all but the most severe climates, a grower can select bramble types that continuously supply the market from late June through frost.

The challenges are many. Brambles need much labor. Canes must be annually pruned and trellised; this cannot be done well mechanically.

FRESH MARKET FRUIT MUST BE HAND-HARVESTED AND SOLD SOON AFTER PICKING. Raspberries and blackberries have the shortest shelf life of any temperate fruit; only special care can maintain quality.

Few commercial growers have more than 5 acres in production; and even this requires excellent management.

ASSESS RESOURCES FIRST

Potential growers should assess natural, capital, and human resources and likely markets before considering brambles. Climate largely determines which types can be grown. Cold winters limit northern ranges; lack of adequate chilling during dormancy limits southern ranges. In general, blackberries are more adapted to southern and raspberries to northern climates.

The coastal Pacific Northwest offers an ideal climate--with winters and summers that are usually mild. Brambles can be severely injured when temperatures drop rapidly between late fall and early spring.

In most areas, special sites and cultivars are required. But the many cultivars will allow growers to produce at least one variety of bramble fruit. Local county cooperative extension agents can recommend varieties for a particular area.

Important for brambles is a well-drained soil. Many varieties are extremely susceptible to diseases in cool, wet soils. Artificial drainage is usually a sound investment.

Although raspberries and blackberries do not tolerate wet soils, neither do their relatively shallow root systems bear drought. Drip irrigation, with a good water source, is generally needed. See "Trickle Irrigation in the Eastern United States" ($3.25), NRAES-4, Northeast Region Agricultural Engineering Service, 152 Riley-Robb Hall, Cornell University, Ithaca, NY, 14853, and "The Basis of Trickle Irrigation," VC-23-82, Univ. of Illinois Cooperative Extension Service, Urbana, IL 61801.

The site should allow cold air to drain; in northern areas, northeast slopes minimize temperature fluctuations until spring.

Prior cropping history is important; weeds and vegetable crops can harbor verticillium wilt disease to which many brambles are susceptible. Growers should identify land for rotation before replanting old fields.

If the crop is to be marketed on a pick-your-own basis, parking space must be available nearby.

Regarding capital needs, it usually takes more than $6,000 an acre to establish brambles. Total investment may be recovered within 6 years, according to Mark Castaldi's "The Cost of Establishing and Producing Small Fruits for Pick-Your-Own and Commercial Harvest" ($3), Department of Fruit and Vegetable Science, Cornell University, Ithaca, NY 14853.

University of New Hampshire economists have developed a bramble crop budgeting template for Lotus software and a manual (NCS-30, $30),

NRAES, 152 Riley-Robb Hall, Cornell University, Ithaca, NY 14853.

"Farming Alternatives: A Guide to Evaluating the Feasibility of New Farm-Based Enterprises" ($5.50), NRAES-32, Riley-Robb Hall, Cornell University, Ithaca, NY 14853, a workbook, can help small-scale growers decide whether to invest.

Labor needs, very inconstant, are a major factor. In full production, each acre may need 10 pickers. State and Federal labor laws must be adhered to. See "Agricultural Employers Notebook," ($14) from Cornell Cooperative Extension, P.O. Box 217, Alton, NY 14413.

MARKET ASSESSMENT

Fruit growers should explore potential markets before investing. Prices can vary considerably with supply, location, demographics, and time of year. Eastern prices are generally higher than those in the West; the large Washington-Oregon processing industry can depress prices. In the South, many consumers won't pay prices listed for exotic produce.

Dale Stokes, former president of the North American Bramble Growers Association, says MARKET IDENTIFICATION IS THE MOST IMPORTANT COMPONENT OF SUCCESS.

Pick-your-own (PYO) is popular for marketing because it reduces harvest labor costs. Successful PYO operators link entertainment with harvest; many customers view picking as recreation.

Westmoreland Berry Farm, outside Washington, DC, markets blackberries both PYO and retail. The typical customer buys $18 to $20 worth of fruit. The farm is within 2 hours' drive of three marketing outlets--Washington, Richmond, and Baltimore, ideal for PYO.

Owners Charles and Anne Geyer say their first 2 acres of blackberries grossed over $30,000 in their third year.

Supermarkets often buy fruit from a grower to bypass a warehouse. Such growers must pay much attention to quality and consistency, packing and cooling fruit soon after picking to extend shelf life.

Some restaurants pay top dollar for fresh raspberries and blackberries but each restaurant uses only a relatively small quantity and deliveries cost time and gasoline.

Roadside stands can be popular but a diverse selection of items may be needed to justify a stand. Many growers sell to others' stands.

Besides fresh fruit, a small-scale grower can produce value-added jelly, juice, wine, syrup, or candy. In St. Louis, Bissinger's, a small candy store, chocolate-coats raspberries in summer, hardly keeping up with demand at $32 a pound.

Sand Hill Berry Farm in Pennsylvania markets a gourmet raspberry vinegar--raspberries, apple cider vinegar, and sugar. The Tomasello Winery in New Jersey finds its raspberry wine popular.

Liquor Store magazine reports raspberry will be the next flavor rage. Raspberry-flavored products are leading sellers at many outlets. Whistling Wing Farms in Maine sells raspberry products, such as jelly and syrup, all over the world by mail order. Its bakery does well selling raspberry pies, muffins, and turnovers. Opportunities are limited only by imagination.

SITE PREPARATION

With adequate resources and an identified market, a grower needs a year to prepare a planting site. Certain changes are difficult if not impossible to make once a planting is established.

First comes an adequate drainage and irrigation system. USDA's Soil Conservation Service (SCS) may help.

Second, perennial weeds should be eliminated through repeated cultivation (as with an organic-enhancing cover crop), herbicides, or soil sterilization.

Third, potential nematode populations should be assessed and controlled. Nematodes not only can damage plants directly but carry viruses that can decimate plantings. They are more of a problem in warmer climates and in lighter soils.

Fourth, adjust the soil chemistry for adequate nutrients and a 6.5 pH--best for brambles. Soil testing varies among laboratories; each has its recommendations for phosphorus, potassium, magnesium, and calcium. Tests may point to peculiar soil conditions. Lime or sulfur can adjust the pH value; a year or more may be required for amendments to effectively change soil chemistry.

OBTAINING PLANTS

In the early 1900's, viruses destroyed a thriving U.S. bramble industry in the East. Uninfected plant materials were unavailable for propagation. But in the 1970's, nurseries, applying tissue-culture techniques, produced brambles without harmful viruses or exposure to diseases.

Nurseries offering tissue-cultured brambles include Ahren's Strawberry Nursery, RR 1, Huntingburg, IN 47542; Congdon & Weller, Mile Block Rd., North Collins, NY 14111; North Star Gardens, 19060 Manning Trail North, Marine, MN 55047; Nourse Farms, Inc., Box 485 RFD, S. Deerfield, MA 01373; and Champlain Isle Agro Associates, Isle La Motte, VT 05463.

Never propagate brambles from a neighbor's patch; infection with viruses from nearby wild brambles is likely.

The performance of cultivars varies considerably with location.

A high demand exists for yellow (golden) raspberries, but plants seem more susceptible to diseases than traditional red raspberries.

CULTURAL PRACTICES

The most complete reference is "Bramble Production Guide," $35, NRAES-35, Riley-Robb Hall, Cornell University, Ithaca, NY 14853. It notes how each type must be treated differently.

Federal and State researchers recently have learned that:

* Plants propagated from tissue-culture, although vigorous and virus-indexed, are sensitive to herbicides normally applied at planting. A straw mulch during the planting year or planting through black plastic may be better than conventional herbicide weed control.

* Spreading fruiting canes apart in the row in a V-configuration significantly improves fruit yield and hastens drying within the plant canopy and makes spraying and harvesting easier.

* New trellising systems for mechanical harvesting include use of monofilament nylon wire as strong as metal but not conductive of lightning. (Amberg's Nursery, 3164 Whitney Road, Stanley, NY 14561, is a distributor.)

* Although raspberries are not widely grown in the South, displaced northerners will demand fresh fruit. Some recently developed southern blackberries include several erect types--no trellises needed--such as Arkansas' recently released thornless Navaho.

* A combination of first year cane suppression, plus mowing half the planting every other year, can bring yields equal to conventional annual intensive pruning and fruiting. This also reduces labor and spray costs--half the cost of planting fruits in any one year.

* Using a floating row cover in early spring over fall-bearing raspberries, such as Heritage, accelerates cane growth and yields. Covers in the north can minimize damage from frosts.

* Inoculating brambles at planting with new strains of particular soil fungi and bacteria may prevent subsequent harmful infection.

* A combination of rapid cooling after harvest, storage of fruit near 30 oF, and maintaining high humidity and carbon dioxide in the storage room prolongs shelf life.

PEST PROBLEMS

Among pests, of most concern are viruses that can be transmitted by aphids, leafhoppers, nematodes, or even bees carrying pollen from wild brambles. See "Virus Diseases of Small Fruits," ($20), Ag Handbook #631, U.S. Government Printing Office, Washington, DC 20402.

Water or high humidity is essential for infection by most disease organisms, so proper pruning and trellising for good air drainage cuts disease pressure. Since most root diseases require standing water to complete their life cycle, good soil drainage minimizes these problems.

Several insects attack bramble canes, flowers, fruit, and leaves. Responsible growers scout plantings regularly, applying insecticides only when pests reach damaging levels. Avoiding locations near insect habitats helps.

The American Phytopathological Society has a "Compendium of Raspberry and Blackberry Diseases and Insects," describing with colored photographs many bramble problems--such as herbicide injury and nutritional deficiencies. ($25, APS, 3340 Pilot Knob Road, St. Paul, MN 55121)

ORGANIZATIONS AND NEWSLETTERS

The North American Bramble Growers Association provides helpful information. Membership is $45 plus $5 per acre up to a maximum of 7 acres. (Richard Fagan, Executive Secretary, Rt. 2 Box 539, Cumberland, MD 21502)

Other sources of newsletters on small fruit crops: Bernadine Strick, Department of Horticulture, Oregon State University, Corvallis, OR 97331; Paul Otten, 19060 Manning Trail North, Marine on St. Croix, MN 55047-9723; Fruit Extension Secretary, Department of Fruit and Vegetable Science, Cornell University, Ithaca, NY 14853.

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August 1991

'BERRY' GOOD NEWS

The information that follows is condensed from an article in the March, 1990 Organic Gardening. It concerns a new variety of strawberry called day-neutral.

As their name implies, day-neutrals are not as sensitive to the summer daylight that cuts off production of June-bearers and curbs everbearers. While it is true that June-bearers produce bigger berries during their short growing season, day-neutrals can eclipse their cousins with a steady

output of smaller but equally succulent berries over 3 seasons (with yields equal to & usually surpassing other varieties).

Interest in this new type of strawberry was slow to develop at first, since many growers didn't know how to handle them. "They demand more attention because they can produce fruit throughout the summer" says Jan Stokesbary of Nourse Farms in South Deerfield, Mass. "They also need more water & fertilizer."

"Because they flower all summer long" she states, "they are also more susceptible to insects (particularly the tarnished plant bug)." Although they are often listed as everbearers in many catalogs, they are a different type entirely. Ever-bearers basically produce 2 crops a year: a traditional one in spring and another smaller crop in the fall.

Phillip Ahrens, owner of Ahrens Strawberry Nursery in Huntingburg, Indiana says TRIBUTE & TRISTAR are the dominant day-neutrals favored for home gardeners virtually everywhere. Introduced in 1981, these sister plants - bred from the same wild parents - are prefixed with a 'Tri' because they yield fruit in 3 of the 4 seasons. Their hardy mountain ancestry predisposes them for all but the coldest areas of the East. They also predominate in Northern & Midwestern climates as well. "It's a function of ground level temperature" Ahrens explains. "Lowering the temperature of the plant's crown increases summer & fall productivity." In any climate, he says a 1/2 inch layer of straw mulch in summer will help cool the soil. "As long as you don't get into 95 + degrees temperature you'll get yields from TRISTAR & TRIBUTE equal to or greater than June-bearers."

Gene Galleta (a member of the USDA team that furthered the original research done in this area) notes that the main tradeoff between day-neutrals & June-bearers is size. "Regular June-bearers are 10 - 14 grams per berry or about the size of a half-dollar in diameter. Day-neutrals are 6 - 8 grams ... in a summer crop, which is about 30% smaller. But you could still make a good shortcake ... and there's no compromise in flavor." A distinct advantage he adds, is that TRIBUTE & TRISTAR are more disease- & stress-tolerant. The plants and their root systems are larger, which makes them more resistant to heat & moisture loss. Thus, they are a little more tolerant to leaf and stem pests. These varieties also show high tolerance to stele & red stele, root rot, verticillium wilt, and leaf & stem rot. TRISTAR is more adaptable to warmer weather, produces better-tasting fruit and higher yields, while TRIBUTE has slightly larger, healthy-looking berries (but these are not hard and fast rules Galleta notes).

Generally, day-neutral ripening in the spring lasts approximately 30 days from open flower to mature fruit. As temperatures rise, this drops to 21 - 23 days. Conversely, as things cool off in the fall, it goes back up to as long as 45 - 50 days. In the spring, TRIBUTE usually weighs 10 - 12 grams per berry, with TRISTAR at 8 - 10 grams each. In the fall, TRISTAR averages 12 and TRIBUTE 15. Ahrens estimates that a spring planting of about 50 plants will be enough to guarantee about 1 quart of berries every day or two during the most productive part of the summer. "There's about a 30 - 50% gain in size during cooler temperatures," Galleta says. "If you keep them watered and keep the bugs off, you'll get even better than that for size. It takes a little know-how."

The main reason the care & feeding of day-neutrals differ from June-bearers is that day-neutrals don't produce as many runners. They start to flower within a couple of days after planting and don't stop until they pack it in for the winter. Set them out as early as possible in the spring. Research shows that the later you plant, the poorer they perform. If you can't plant them by mid-May in the north, it may not be worth it. Set them as close as 4 - 5 inches apart. They do best if staggered in rows instead of next to each other, since they apparently compete with each other.

To prevent stunted growth, it's a good idea to pinch off flowers for 6 weeks after initial planting to allow them to reach sufficient size before bearing fruit. Thirty days after that, you should be picking berries! Pinch off runners all during the season as well, so plants will concentrate their energy on berry production, not daughter plants. Since day-neutrals don't produce as many runners as other varieties, this isn't as difficult as it may sound at first.

Soil temperature is a key to successful cultivation. Since day-neutrals have a shallow root system, immediate mulching (with straw, for example) helps. In warmer climates, the recommendation is a white plastic mulch over a dark plastic. The white plastic doesn't allow light penetration and keeps soil temperatures below 85 degrees, while the black plastic helps retain moisture. To protect berries from the hot days of August, take a tip from commercial growers and try evaporative cooling. Rig up a mist-type sprinkler and place it in the middle of your beds. It will release a small amount of moisture into the air, not flood them with water. The secret is not to use it after 4 P.M. (noon to 3 P.M. is best). This will keep them cool during the heat of the day, but not get them so wet that diseases caused by too much

dampness might occur.

Proper feeding is also important. Traditional strawberries are fertilized once a year, usually in June. Day-neutrals prefer a slow, steady feeding of nitrogen. Add compost, well-rotted cow manure or fish emulsion every 2 weeks or so throughout the growing season. Work a moderate amount in the top layer of soil.

Although many prefer to treat them as annuals, they can be overwintered. Begin mulching in late fall (after 1 or 2 good frosts), with 1 1/2 - 2 inches of loosely applied straw which should be removed when spring growth starts. If plants become too dense in their 2nd & succeeding years, the size of fruit will diminish accordingly. Thin runners enough to be able to spot your closed fist in the growth before it touches the crown of the plants. If you do overwinter, you should have fruit in June. In their 2nd year, expect a flush of berries in June, then rest in early July, coming back with more in early August. They don't do much more for the rest of the 2nd season.

As mentioned earlier, the tarnished plant bug is the most prevalent pest. It feeds on the flowers and causes the fruit to become nubby. They tend to increase during the summer, getting progressively worse. One defense is spunbonded-polyester row covers on the plants when the bugs are at their peak (at night & early morning). Another is to remove the covers after blooms open, about midday, to encourage pollination. An organic spray of sabadilla dust once or twice weekly is also helpful. If you do, be sure to rinse them well before eating. Ahrens says he has been able to harvest right up until Thanksgiving by using the row covers in spring & fall. "They are more efficient in fall than spring ... you

have a residue of warm temperature in the ground and ... get
8 - 12 degrees of protection during the cool fall evenings."
Agrinet has a new, lighter weight product than the frost
protection ones that provides an insect barrier as well. It
offers almost total light transmission and is 100% effective
at keeping the tarnished plant bug out come springtime.
Ahrens says "It's like a real fine hair net. Water trickles
right through it."

SOURCES:

Ahrens Strawberry Nursery
RR 1
Huntingburg, IND. 47542
(812) 683-3055

Brittingham's Plant Farms
P.O. Box 2538
Salisbury, MD. 21801
(301) 749-5153

Nourse Farms, Inc.
Box 485 RFD
South Deerfield, MA. 01373

Stark Bros. Nurseries
Louisiana, MO. 63353
(800) 325-4180 or
(314) 754-4525 (in MO.)

Rayner Bros., Inc.
P.O. Box 1617
Salisbury, MD.21802
(301) 742-1594

Allen Company
P.O. Box 310
Fruitland, MD. 21826
(301) 742-7122