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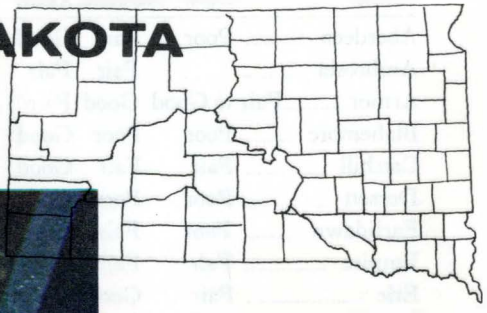

HORTICULTURE-FORESTRY
DEPARTMENT

AGRICULTURAL
EXPERIMENT STATION

SOUTH DAKOTA
STATE COLLEGE, BROOKINGS

CHARACTERISTICS OF JUNEBEARING VARIETIES

Variety	Plant Characteristics			Fruit Characteristics			
	Adaptation	Winter Hardiness	Plant Making Ability	Season	Size	Quality	General Rating
Aberdeen	Poor	Fair	Good	Mid-season	Medium	Fair	Poor
Ambrosia		Fair	Fair	Late	Large	Fair	Fair
Armor	Fair to Good	Good	Fair	Late	Large	Good	Good
Blahemore	Poor	Poor	Good	Mid-season	Medium	Fair	Poor
Catshill	Fair	Fair	Good	Mid-season	Medium	Good	Fair
Dorsett	Poor	Poor	Good	Mid-season	Medium	Good	Poor
Earlidawn	Poor	Fair	Poor	Early	Medium	Poor	Poor
Empire	Fair	Fair	Fair	Early	Large	Good	Fair
Erie	Fair	Good	Good	Late	Large	Fair	Poor
Fairland	Fair	Poor	Fair	Mid-season	Medium	Good	Poor
Fairpeake	Poor	Poor	Fair	Mid-season	Medium	Good	Poor
Fairfax	Poor	Poor	Fair	Mid-season	Large	Good	Poor
Jerseybelle	Fair	Fair	Poor	Late	Large	Good	Fair
Pathfinder	Fair	Fair	Good	Mid-season	Medium	Fair	Poor
Pocahontas	Good	Fair	Good	Mid-season	Large	Fair	Good
Premier	Good	Good	Good	Early	Medium to small	Fair	Good
Redstar	Poor	Poor	Poor	Late	Large	Good	Poor
Robinson	Good	Good	Good	Late	Large	Fair	Good
Senator Dunlap	Good	Good	Good	Mid-season	Medium	Fair	Good
Sparkle	Good	Fair	Good	Mid-season	Medium	Good	Good
Tennessee Beauty	Fair	Good	Good	Mid-season	Medium	Poor	Fair
Vermilion	Fair	Good	Fair	Mid-season	Medium	Good	Fair
Oglala	Good	Good	Good	Mid-season	Small	Good	Fair

Strawberry Production in South Dakota

By S. A. McCrory[1]

Commercial strawberry production offers much promise in South Dakota. Most of the strawberries sold in local food stores are shipped from other areas, including California, Minnesota, and Wisconsin.

Dealers have expressed a preference for the locally-grown berry. It has two big advantages—it is usually fresher and it is produced when the peak of strawberry production in other areas has passed.

In 1950, a USDA report showed only 50 acres of strawberries in the state. The same report showed great fluctuation in acreage over a 30-year period. No doubt weather and economic conditions had something to do with the fluctuation. However, no information indicates that a surplus has ever been produced or that there has ever been a marketing problem. The present acreage could be greatly increased without danger of creating a surplus in the state.

Cost, Yield, and Profit

The strawberry is a high income crop and therefore high production cost per acre can be justified. It is a "family type" enterprise; all members of the family can contribute to production.

The cost of growing an acre of strawberries will vary among growers. Based on information collected from experimental plantings, 240 hours of labor are necessary to produce and harvest an acre of strawberries. The method of harvesting and marketing will influence the labor needs. Also the labor cost will be greater on a small planting than on a larger unit. The cost of 5,000 virus free plants will be about $75. This quantity and cost will vary some with varieties but is about

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average. Land, cultivating equipment, fertilizer, crates, and boxes and irrigation equipment may serve more than one purpose and are difficult to assess at a fixed cost.

The greatest yield may be expected 1 year after planting. If a planting is retained 2 years the cost of production is less. Yield data for any 1 year may be misleading but first year yields from experimental plots have been as high as 7,200 quarts per acre, with 4,000 about average. Yields from a 2 year old planting have generally been about one-third less than the first year.

Profit from a strawberry planting has usually been in proporation to the care given. Assuming that average to good practices are followed, an acre of strawberries will net a profit of $1,000 per acre-year period. To have a profitable crop, a grower must be timely in all his operations. Soil preparation, ordering plants, planting, weeding, de-blooming, watering, mulching, picking, and many other operations must be done at the *right time.* Neglecting any one essential may drastically reduce profit.

Most prospective growers are concerned with the available labor supply and market outlet. Some growers have solved both problems by selling the crop on a "pick yourself" basis. Established growers have made sales by this method over a large area and reduced the labor problem at harvest time. Grower experience suggests that 1 acre per 1,000 people will be consumed locally.

Selecting a Variety

New varieties are being introduced continuously. The fact that a

Matted rows show varietal differences in plant making ability.

new variety is well adapted to a given area does not prove it will produce equally well in other areas. Soil, moisture, and climatic conditions will determine the performance of any variety. To test a new variety it may be planted beside standard varieties of known performance for comparison. Generally a 2 to 3 year test will enable a grower to select varieties that fulfill his requirements. It is more important to select a variety on a basis of climatic adaptation than some characteristics that may be pleasing to the grower.

Climatic Influence

Environmental factors affect plant behavior. There is an interrelation of temperature and day length that determines runner and fruit bud formation. Conditions subject plants to a short growing season and at times extreme temperatures. Earlier studies suggest that some varieties such as Premier harden themselves for winter early and can therefore be covered with a mulch early. Other varieties, such as Senator Dunlap, continue to develop winter hardiness until late in the fall and benefit from a delayed mulching.

The rest period of strawberry plants is associated with temperature and day length. Only varieties able to enter the rest period and to remain dormant during the winter months are likely to be dependable bearers. Cheyenne, Sioux, and Radiance were developed to withstand low temperatures. These varieties may be successful in parts of the Great Plains area where other varieties fail. Their small size fruit makes them less desirable than Premier, Senator Dunlap, Vermillion, Sparkle, and Robinson which grow in Eastern South Dakota.

Soil and Moisture

Strawberry varieties differ in their adaptation to soil, fertility, and moisture. The Wayzatta variety will make few or no runners when grown on dry soil. When grown on very fertile soil, Robinson will make so many runners that little fruit is produced. Premier, Senator Dunlap, and Gem are adapted to a wide range of soil conditions and are capable of producing runners when the moisture supply is well below the optimum.

Ripening Period

The ripening season for most strawberry varieties is short in South Dakota. The back cover shows distribution of the picking season for leading varieties in one season. The harvest may last but a few days with a large percentage of the fruit being harvested by a few pickings, or it may be extended over a longer period.

Everbearing varieties may show a variation in the percentage of the total yield that is produced in the fall crop. Table 1 compares two everbearing varieties in this respect.

Plant Making Ability

The ability of varieties to make runners and produce fruit the following year is shown in tables 2 and 3. The plants were set the last week in April and counts were made on August 8. Soil fertility was aver-

Table 1. Comparative Summer and Fall Yield of Two Everbearing Strawberry Varieties

Variety	Yield, pints*		
	Fall, 1st year	Summer, 2nd year	Fall, 2nd year
Mastodon	15.8	47.5	16.2
Gem	25.8	64.4	47.8

*Gem produced 43% of its crop the second year in the fall while Mastodon produced 25% of its crop at that season.

age, temperature was near normal, and 16.73 inches of rain fell from April 1 to August 1. A 6-10-4 fertilizer was applied as a side dressing at the rate of 1 pound in 25 feet of row. Another treatment consisted of applying irrigation water when the soil showed evidence of drying. A third treatment supplied both fertilizer and water. The following summer the berries were counted and the number produced per plant determined.

Varieties show a different response to treatment. Redstar and Vermillion increased in yield where additional water was applied. Premier and Senator Dunlap yields were not increased, which may have been associated with runner formation the previous year.

Varieties

Many varieties are regional in their adaptation and may largely determine the success or failure of the strawberry grower. A research project designed to evaluate varieties was started in 1944, and since that time the more important varieties have been grown for observation. Those showing promise have been observed over a longer period and in greater detail.

Like all crops, strawberry varieties have great differences in characteristics. The ability to make runners, survive winter conditions, and produce a good yield of quality fruit were considered. Descriptions given here are designed to aid growers in selecting varieties that will do well under South Dakota climatic conditions and serve the purpose for which the crop is intended.

For local sales the fruit should be

Table 2. Average Strawberry Runners per Plant From Four Treatments

Variety	Check	Irrigated	Irrigated+ 6-10-4	6-10-4
Fairland	9.9	11.1	12.3	15.2
Senator Dunlap	8.7	13	13	13.1
Erie	8.2	11	14	13
Superfection	8.1	9.5	7.7	12.3
Vermilion	8	7	8.5	9.1
Empire	7.4	8.1	13.1	13.4
Premier	6	7.2	9.4	11.5
Sparkle	4.5	4.5	10.1	9.2
Redrich	4.5	6	7.5	7.5
Redstar	2	2	3.4	4.5
Fairpeak	2	2.5	3.4	4.2

Table 3. Strawberries per Plant by Varieties and Treatment

	Check	Irrigated	Irrigated+ 6-10-4	6-10-4	Average
Premier	32.52	14.15	12.48	10.61	17.44
Redstar	9.76	18.86	19.61	9.11	14.33
Fairpeak	19.38	18.95	15.94	6.6	13.73
Redrich	13.98	16.18	11.27	12.63	13.51
Sparkle	11.49	14.52	13.73	6.94	11.67
Vermilion	9.8	11.2	14.5	9.87	11.4
Superfection	14.86	10.46	9.78	8.27	10.84
Erie	9.85	12.86	10.52	8.25	10.37
Fairland	9.64	8.85	9.98	9.24	9.43
Senator Dunlap	9.27	8.37	7.09	6.26	7.75
Empire	5.46	8.42	5.86	3.77	5.88
Total	**146.01**	**142.82**	**130.76**	**91.55**	
Average	**13.27**	**12.98**	**11.88**	**8.32**	

attractive, large, and of good quality. It need not be so firm or have other characteristics required for shipping. A variety should have the ability to set runners with existing climatic conditions. It must also be able to tolerate winter conditions without serious loss.

Some varieties that have been tested were so poorly adapted that they are not described here. Some of those described are not recommended for planting. They appear in alphabetical order with Senator Dunlap and Premier used as standards for comparison.

June Bearing Varieties

Aberdeen is an old variety and is not offered for sale by many plant growers. It ripened with the mid-season varieties. The first fruit to ripen was of medium size, but the last of the crop was very small. The fruit was a very light red and too soft for commercial purposes. The plants made runners in fairly good numbers and were vigorous. The variety did not show winter hardiness or other characteristics desired of a variety to be grown here. There are many varieties better than Aberdeen.

Ambrosia was one of the latest maturing varieties, which may be a reason for growing it. The blossoms were also late in opening, which may enable this variety to escape late frost injury. The fruit was large and attractive but lacked the quality desired. Plants of this variety showed some winter injury for the 2 years they were observed.

Armor was a late variety but a few days earlier than Ambrosia. The fruit was large, irregular, and round to blunt in shape. The color was attractive but not a deep red. The quality was good and the berries were firm enough to be handled without damage. The plants survived the winters well under mulch protection. Armor produced vigorous runners well. This variety was a good producer but the harvest season was not as long as for some var-

ieties. On a limited testing program, Armor appeared to have promise as a variety to ripen just after Senator Dunlap.

Blakemore has been one of the most popular varieties in the southern and central states. Because of its high producing ability in that area it was included in the local test plots. One good crop was produced in the 4 years it was under observation. Climatic conditions caused severe plant loss. For that reason it is not considered a dependable variety to plant in South Dakota.

Catskill has long been a leading variety for many of the commercial strawberry growing areas. The bright red fruit matured in mid-season and was of good quality. Yields were not equal to Senator Dunlap but were better than Premier. The "caps" remained green and were easily removed from the berry. The plant was a strong grower and made ample runners when sufficient moisture was available. It suffered from winter injury unless well protected by a mulch. However, for the grower who will attend to the details essential to good strawberry culture, Catskill is a mid-season variety worth considering. The fruit stems were tolerant to abuse by pickers.

Dorsett was an early variety, ripening 3 to 4 days later than Premier. The fruit was of good quality, firm, and attractive. Unfortunately many of the berries were poorly developed and many were culls. Dorsett was a good plant maker and under favorable growing conditions set too many plants. Yields have never been as high with Dorsett as with many other varieties.

Earlidawn ripened fruit earlier than any variety tested which appeared to be its outstanding characteristic. The fruit was very attractive and firm. Its firmness will permit much handling without damage. An objectional feature was the tart fruit. When grown at Brookings it was a sparse plant maker even when given supplemental water. Because of this weakness the plants should be given close spacing and provided with ample moisture if a good row is to be obtained. Other than for earliness there seems to be no reason for planting this variety.

Empire was an early maturing berry ripening about 2 days later than Premier. The fruit was large, very attractive, had good quality, and was firm and easy to pick. The plants were large and vigorous, requiring much space per plant. This variety appeared to be injured from high temperatures and drought. It was observed only where irrigation was practiced and under such conditions has produced an abundance of runners. From this limited test, Empire appears to have promise where a high quality, attractive fruit is desired.

Erie was grown in an observation planting for 2 seasons and then placed in a replicated planting for 2 years. Only one good crop was produced in the 4 years is was observed. The plants grew well and made excessive runners late in the growing season. Erie can not be highly recommended for planting in South Dakota.

Fairland was a high quality variety, but was not a good producer because of winter injury. It never grew

well at Brookings and information to accurately describe it could not be collected.

Fairpeake was similar to Fairland. This variety did not appear well adapted to local growing conditions.

Jerseybelle is a new, late maturing variety that was observed for two seasons in the test plots. The fruit was very large, attractive, and of good quality. The yields have been only fair but the size, quality and attractiveness may be more important than total yield. To set enough runners the plants required good care and supplemental moisture. This variety may have a place in a home planting or for a commercial grower who grows for a select trade.

Pathfinder is an older variety now largely replaced by better varieties.

Pocahontas is fairly new and looked promising in the test plots. It was a mid-season variety, ripening about the same time as Senator Dunlap. The fruit was round, attractive, firm, and of fair quality. The fruit ripened over a long period with fair size to the end of the picking season. The fruit spurs were rigid and stood erect, keeping the fruit off the ground. Pocahontas was a fairly good plant maker each year but less inclined to set an excessive number of plants. Plants survived the winter without apparent injury when protected by a straw mulch. This variety is worth a trial as a mid-season variety.

Premier is also known as Howard 17. The fruit of Premier ripened early and was the earliest good quality variety observed in this test. The first fruit to ripen was of average size but the last of the crop was frequently too small to be of value. The long, pointed fruit was an attractive color, of good quality, and firm. Virus free Premier plants were strong, vigorous growers and set runners freely. The variety was well adapted to local conditions and survived winter temperatures well. This variety has been able to "harden" the plants early for winter and could therefore be mulched earlier than any variety observed. Premier has long been considered more tolerant to frost than other varieties. This may be due, at least in part, to the long blooming period. Premier was a good variety for the early season and was suitable for both home and commercial purposes.

Redstar was one of the very late maturing varieties. The fruit was large and attractive. The firm fruit was of good quality making it well adapted for both commercial and home use. The late blooming habit provided some frost protection. Redstar did not make many runners and few plants were set. This weakness was overcome in part by irrigation and fertilizer but under good growing conditions it was a poor plant maker. For the grower interested in a late maturing variety Redstar may have a place.

Robinson was a late season variety ripening most of its fruit during the first 2 weeks of July. The fruit was large and bright red. Because of the soft nature of the fruit it did not stand much handling. Quality was only fair and during wet weather many berries decayed. Near the end of the harvest the small

fruit was objectionable. Robinson plants were hardy and relatively free of foliage diseases. Robinson always set many plants and with favorable growing conditions produced too many. Robinson was not as dependable as were some varieties and failed to produce a good yield if climatic conditions were not favorable. However, its good points are great enough to recommend it for a late maturing variety.

Senator Dunlap has been the variety most likely to produce a good crop in South Dakota. The berries were medium in size, frequently soft, and of fair quality. The yield has consistently been greater than any other variety with which it has been compared. It was a good plant maker, even with limited rainfall. It was very winter hardy and will tolerate much cold weather before mulching in the fall. Senator Dunlap should make up at least a part of every strawberry planting as a mid-season variety.

Sparkle was well named as the fruit was so bright and attractive it did sparkle. This medium size fruit ripened late and the blossoms sometimes escaped frost damage. The fruit was firm and suffered little mechanical injury. Fully ripened fruit darkened and was less attractive. The plants were vigorous and set runners in sufficient quantity. Sparkle survived the winter without apparent injury when properly mulched. It is a promising late variety for both home and commercial planting.

Tennessee Beauty was observed two seasons in the test plots. The fruit was round, of medium size, and ripened a few days later than Senator Dunlap. The quality was only fair but the fruit was so firm that it withstood more handling without injury than any variety tested. In this limited test it appeared to have great enough winter hardiness to recommend it for planting in South Dakota.

Vermilion was a promising variety. The fruit ripened in mid-season but over a longer period than most varieties. The medium sized fruit was attractive and of good quality. The plants were vigorous, erect growers, and survived winter conditions well. The fruit was easy to harvest and retained its size to the end of harvest better than most varieties. When well grown, enough plants were produced to make an ideal row. Yields were high, second only to Senator Dunlap. Vermilion is a good mid-season variety for South Dakota.

Everbearing Varieties

Evermore was developed by the Minnesota Experiment Station and for a time was popular in the northern area. It appeared to be rather exacting in its requirements. At times the variety looked very promising but another year was less desirable. Few plants of Evermore are to be found now, which suggests it has not been well accepted by growers.

Gem, an old everbearing variety, is the most commonly planted everbearing in South Dakota. The fruit was round, light in color, and firm enough to stand considerable handling. The tart flavor was sometimes objectionable but the quality was

generally acceptable. The fruit was produced on short stems causing much of the fruit to be dirty or decayed. The plants did not produce many leaves with the fruit fully exposed to birds. While Gem is considered a winter hardy variety, it frequently showed much winter injury. Like many everbearing varieties, it did not make as many plants as are desired. It was subject to virus diseases with an accompanying loss of vigor. The variety appears best adapted for home use.

Superfection was identical to Gem.

Red Rich was a very high quality variety. The large, dark red fruit had eye appeal, was fairly firm, and produced a good yield. The seeds were large and prominent, making it a little objectionable. The plants were large and vigorous, producing plenty of runners. Red Rich has shown ample winter hardiness.

Streamliner was observed only two seasons but deserves consideration. The fruit was of medium size, good quality, and firm. The yields were good and the plants were vigorous and produced ample runners. No winter injury was apparent. This everbearing variety is worth planting for trial.

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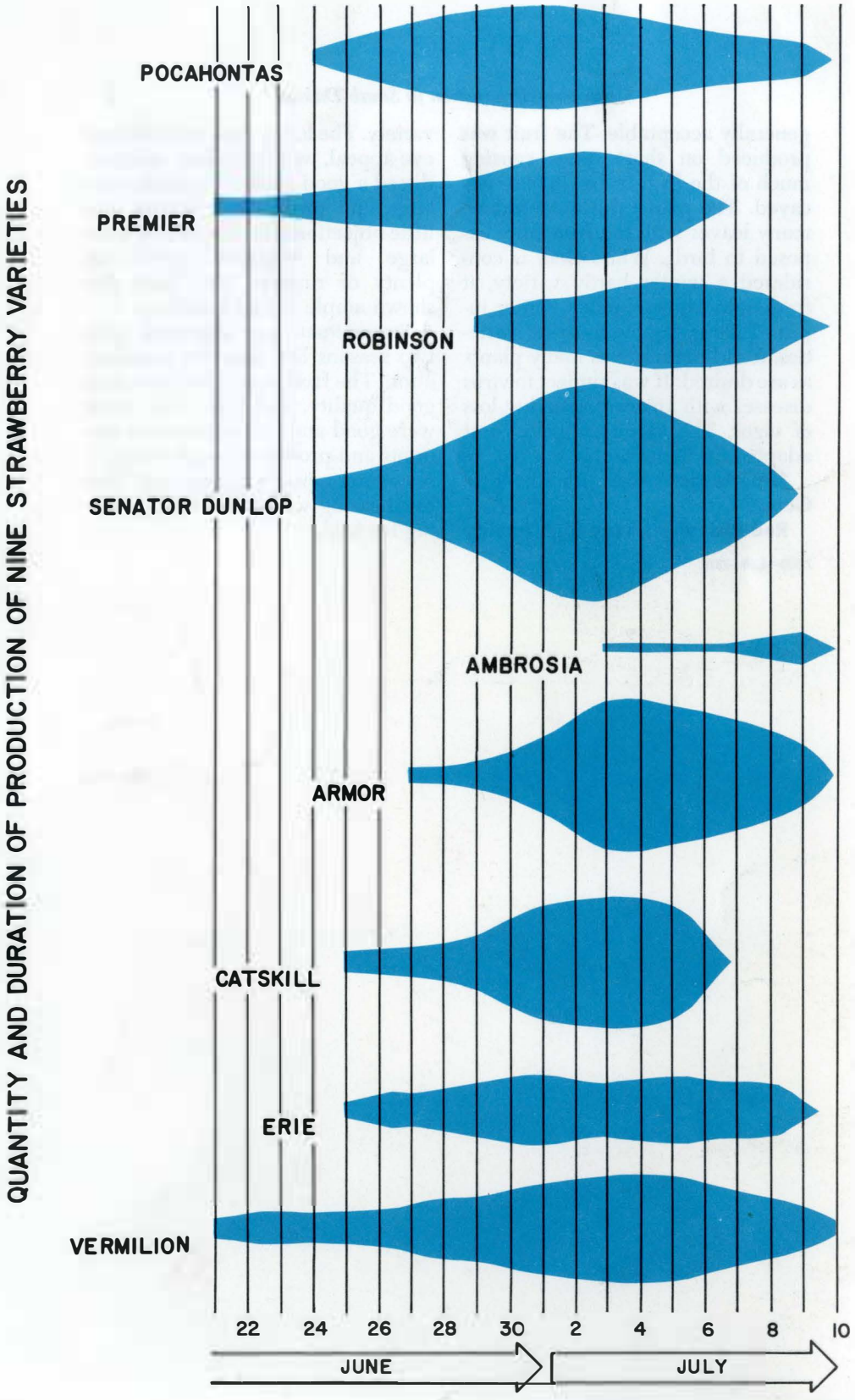
QUANTITY AND DURATION OF PRODUCTION OF NINE STRAWBERRY VARIETIES
POCAHONTAS
PREMIER
ROBINSON
SENATOR DUNLOP
AMBROSIA
ARMOR
CATSKILL
ERIE
VERMILION
22
24
26
28
30
2
4
6
8
10
JUNE
JULY