30 million bushels. This can be compared to 25 million bushel in 1987 and 26.2 million bushel in 1985.

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Mid-Atlantic Apple Cultivars

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Abstract

The mid-Atlantic region has 6.8 million apple trees, but all states except Virginia have experienced tree losses during the last seven years. The five cultivars accounting for 85% of the production, in descending order of importance, include 'Delicious,' 'Golden Delicious,' 'Rome,' 'York,' and 'Stayman.' 'Stayman' is declining in importance due to fruit cracking problems, but the other four cultivars will remain prominant for the next 15 years. 'Gala' is the only new cultivar likely to be planted in volume in the next five years.

Introduction

The mid-Atlantic region has been an important apple producing area for more than 200 years. For many years apple cultivars of local origin were grown, but since World War II the number of these important cultivars has declined.

There are two distinct apple industries in the mid-Atlantic region. About 70% of the 4.7 million apple trees grown in Pennsylvania, Virginia, and West Virginia are concentrated within 60 miles of Frederick, Maryland. The orchards in this area tend to be large (mostly > 100 acres) and about 70% of the fruit is processed. Orchards in other parts of the region tend to be smaller (mostly < 100 acres) and produce primarily for the wholesale and retail fresh fruit markets. Differences in fruit utilization influence cultivar selection in each area.

Discussion

The region has lost about 632,500 trees since 1982 and only Virginia has increased tree numbers (Table 1). Primary reasons for the decline in tree numbers include increasing land values due to urbanization, unavailability of labor (especially orchard managers), and poor prices for processing fruit. Tree density has increased more slowly than in some parts of the country, but has increased from 72 to 76 trees per acre from 1982 to 1987.

'Delicious' is the most important cultivar in the region and varies in importance from 47% of the trees in North Carolina to 28% in Pennsylvania and West Virginia (Table 2). 'Golden Delicious,' 'Rome,' 'York,' and 'Stayman' are the other major cultivars of the

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Table 1. Estimated apple trees and acreage for six mid-Atlantic states, with changes in tree numbers from 1982 to 1987 and changes since 1987 and for the near future.[1]

State	Acres	Trees (millions)	Tree changes 1982 to 1987	Tree changes Near future
Maryland	3,000	0.45	-150,000	S[2]
Pennsylvania	32,858	2.44	-280,000	D
North Carolina	11,542	1.01	-140,000	S
New Jersey	5,460	0.35	- 62,510	D
Virginia	23,352	1.55	+100,000	I
West Virginia	15,330	0.99	-100,000	D
Total	91,542	6.79	-632,510	

[1]Estimates made from 1987 tree surveys and by extension specialists within each state.
[2]Increase (I), Steady (S), Decrease (D).

region. 'York' is a premium processing cultivar and is grown only in South Central Pennsylvania, Northern Virginia and the panhandle of West Virginia. 'Rome,' 'Golden Delicious,' and 'Stayman' are considered dual purpose cultivars which command a premium from processors, but which can also be sold for the fresh market.

The relative importance of the five major cultivars has remained fairly constant for the past 20 years (Table 3). Since 33% and 18% of the trees planted from 1982 to 1987 were 'Delicious' and 'Golden Delicious,' respectively, these will remain the predominant cultivars for the next 20 years.

Table 2. Important apple cultivars and their estimated percentage of total trees in 1987.[1]

Cultivar	Percent of total trees by state PA	NC	NJ	VA	WV	Mean
Delicious	28	47	38	39	28	36
Golden Delicious	16	25	8	19	22	18
Rome	12	19	17	7	11	13
York	17	0	0	15	23	11
Stayman	7	4	10	8	5	7
Other	20	5	27	12	11	15

[1]Data obtained from 1987 state tree fruit surveys. Recent estimates not available for Maryland.

Table 3. Important apple cultivars of the mid-Atlantic region expressed as the percent of total trees in each of three age groups.[1]

Cultivar	Percent of total trees in age group Tree age (yrs) <6	7-21	>21
Delicious	33	31	31
Golden Delicious	18	18	19
Rome	9	8	9
York	8	8	16
Stayman	8	6	8
Other	24	29	17

[1]Percentages estimated from data in 1987 state fruit tree surveys.

'York' may decline in importance since 53% of the trees are more than 20 years old and only 15% of the 'York' trees were planted since 1982 (Table 4). Most of the young 'York' trees are red strains and are being grown as a dual purpose cultivar. 'Stayman' trees are rapidly being replaced with other cultivars. Now that daminozide is no longer available to suppress fruit cracking, the decline in 'Stayman' production will likely accelerate.

Because of important retail industries, states such as Pennsylvania, Maryland, and New Jersey, grown 20-30% other cultivars such as 'Jerseymac,' 'Paulared,' 'Gala,' 'McIntosh,' 'Jonathan,' 'Empire,' 'Cortland,' 'Idared,' and 'Winesap.'

Table 4. Important apple cultivars of the mid-Atlantic region expressed as the percent of trees in each age group per cultivar.[1]

Cultivar	Percent of trees within cultivars Tree age (yrs) <6	7-21	>21
Delicious	20	49	31
Golden Delicious	20	42	38
Rome	25	39	36
York	15	32	53
Stayman	25	34	42

[1]Percentages estimated from data in 1987 state fruit tree surveys.

Table 5. Future apple cultivar selections for the mid-Atlantic States.[1]

Cultivar	MD	NC	NJ	PA	VA	WV
Braeburn	L	T	L	T	T	T
Delicious	D	S	S	S	S	S
Empire	I	T	I	I	T	I
Fuji	L	T	L	L	T	T
Gala	I	T	I	I	I	I
Golden Delicious	D	I	S	S	D	S
Idared	L	L	L	T	L	I
Jonagold	I	L	I	I	L	T
Jonathan	S	L	L	D	D	D
Mutsu	L	I	L	L	L	T
Paulared	D	L	S	L	L	L
Rome	S	I	S	S	S	S
Stayman	D	L	D	D	D	D
York	L	L	L	I	I	I

[1]Based on conversations with extension specialists in each state.
[2]Increase (I), Steady (S), Decrease (D), Trial plantings (T), Little interest (L).

Although there is interest in new cultivars, during the next 20 years new cultivars will probably make up less than 5% of the total trees in the region. A few sizable plantings have been set for wholesale markets, but most plantings are small (< 20 acres) and are intended for retail sales. All of these newer cultivars have undesirable characteristics that will limit large-scale plantings. 'Jonagold' lacks color in shaded portions of the tree and in warmer areas of the region. 'Empire' lacks size and colors poorly in warmer areas. 'Gala' has tremendous consumer acceptance, but since it matures with late-season peaches, many producers will be unable to harvest and pack 'Gala.' 'Gala' also requires 3 to 5 pickings and since it matures several weeks before 'Delicious,' harvest labor may be unavailable. 'Granny Smith' has not been planted heavily because mature fruit usually develop an unattractive dull orange-red blush and an uneven surface. Acreage of the dual purpose cultivars 'Idared' and 'Mutsu' has increased slightly and may increase during the next decade. There is limited interest in 'Fuji' and 'Braeburn,' and trees are being planted on a trial basis.

With the recent concern about pesticides, there is limited interest in disease-resistant cultivars such as 'Freedom,' 'Jonafree,' and 'Liberty.' If such cultivars prove suitable for processing, they may be planted as dual purpose cultivars. Although fewer fungicide sprays are required, these cultivars cannot be grown organically because insects, sooty blotch, fly speck, and fruit rots must still be controlled.

The major reason that apple cultivar selection is changing slowly in the mid-Atlantic region is probably because the industry is already fairly diverse: five cultivars are heavily planted and fruit is grown for both fresh and processing markets. For whatever reason, 'Delicious,' 'Golden Delicious,' 'York,' and 'Rome' will remain the predominant cultivars for the next 15 to 20 years because these were the cultivars most heavily planted in the late 1980's (Table 5).

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Stability of 'MacSpur McIntosh' Trees

In a recent report on a study of 9 year old 'MacSpur' trees in a commercial orchard in New Brunswick trees were grouped according to 3 degrees of spuriness. Reduced terminal growth, fewer limbs per tree, more flowering spurs on 2 and 3 year wood were associated with the highest degrees of spuriness and coupled with less yield and less yield efficiency. The trees in this orchard ranged from a growth habit similar to standard 'McIntosh' all the way to a group with the true spur habit. The variability suggests the 'MacSpur' may be an unstable periclinal chimera.

From: Embree et al. 1991. Variation in Growth, Spur Density and Yield of 'MacSpur McIntosh.' HortScience 26 (2):188-190.