Varieties of Tree Fruits for Iowa Planting

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Varieties of Tree Fruits for Iowa Planting

BY H. L. LANTZ

Apple orcharding in Polk County. Jonathan, Grimes and Delicious are leading apple varieties

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

C. F. CURTISS, Director

POMOLOGY SECTION

Ames, Iowa
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IOWA APPLE GROWING REGIONS

Area 1. Jonathan or winter apple belt.
Winter apples of standard commercial quality do well.

Areas 2 and 3. Wealthy belt.
(a) Summer and fall apples do best.
(b) Area 2, winter varieties grown in area 1 may be planted in home orchards, but not commercially.
(c) Only hardiest varieties should be planted in area 3.

Area 4. A few winter varieties of area 1 do well in area 4 on specially selected soils with favored exposures.

APPLE VARIETIES FOR COMMERCIAL PLANTING

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See variety discussions.

VARIETIES FOR HOME ORCHARD PLANTING

Thirty or forty trees are enough for home orchard. Four trees each of summer and fall varieties are plenty, balance should be of winter season. A greater number of varieties are permissible than in commercial plantings.
Fig. 1. Two notable apples have originated in Iowa. The original Delicious tree (left), now over 50 years old, still is productive. The original Patten (Greening) tree (right) has stood thru many ‘test winters’ at Charles City.
Varieties of Tree Fruits for Iowa Planting

PART I. APPLES

By H. L. Lantz

This circular is intended to assist Iowa orchardists in the selection of satisfactory tree fruit varieties either for home or for commercial production. By consulting the descriptions and discussions herein given and by informing himself as to the present status of varieties already grown in his locality, the prospective planter should be in a position to make a selection which will succeed and bring to him satisfactory returns. Doubtless future years will place different valuations upon many of the varieties discussed for Iowa planting.

Many hundreds of varieties of apples have been named and introduced into the trade. Comparatively few have stood the test of the years and the continued trial in any part of this country. Most of them fell short in some vital character, which relegated them to a list of "has-beens." Even old-time sorts, like Rambo, Ralls, Sweet Bough and many others, highly favored in the earlier horticulture of the country, have been discarded because they are not as good in a number of respects as some of the newer varieties.

Horticultural progress is linked closely with the origination and introduction of new and better varieties. The fruit grower, however, can well afford to investigate carefully all new varieties until he has seen them given a fair trial in his locality. As a general rule, no new variety should be planted extensively until it has proved its right thru trial to a place in the planter's list of commercial sorts. For those who wish to experiment, nothing adds more interest to the orchard collection than a number of new and odd varieties.

It is not enough to know that soil and climatic conditions are well adapted to growing apples, but it is equally important that such characteristics as disease susceptibility, hardiness, age of bearing, etc., of the various varieties be understood. Particularly is this true of the commercial orchard, where success is so largely dependent upon choosing varieties in demand in the general markets.

FACTORS TO BE CONSIDERED IN SELECTION OF VARIETIES

Climatic and soil relations cannot be overlooked in deciding upon a planting list in any section of Iowa. Distribution of
rainfall, summer heat and winter cold are limiting factors for certain varieties.

Varieties differ widely in soil and climatic requirements. Such excellent varieties as Esopus and Yellow Newtown are so exacting in these respects that they are planted in but few states and are not at all satisfactory in Iowa. On the other hand, Jonathan is much less exacting as to soil and climate and is grown in practically every state in the union where apples are grown, making it one of the most widely known apples in America. But even Jonathan and other widely adapted varieties do not succeed equally well in all locations. These examples indicate the value of recognizing the factor of adaptation.

Furthermore, a number of varieties are available which succeed well enough in Iowa in so far as the tree is concerned, but which are inferior in fruit quality. Iowa Blush, for example, is hardy and productive, but is not highly esteemed because the fruit is so distinctly inferior in size and quality. Hibernal is another hardy, vigorous sort, but is of value only where other varieties fail because of lack of hardiness.

**EXPERIENCE EMPHASIZES THE VALUE OF HARDY VARIETIES FOR IOWA**

Horticultural experience in Iowa dates back nearly a hundred years. In 1836, Robert Avery set out an orchard and later developed quite a large nursery in southeastern Iowa. Other nurseries soon came into existence, and trees were planted more and more widely as the land was taken up by the settlers. During these years, practically every known variety and type of fruit was given a hopeful trial. The virgin soil produced wonderful tree growth and promoted early fruiting. Everyone who planted trees was at once greatly encouraged and felt that in Iowa a great pomology was easily possible. There was no fruit growing experience to guide the pioneers. Little did they realize that few of the favorite old New England, New York and old country sorts were adapted to the rigorous climatic conditions which prevailed, particularly in central and northern Iowa. Many thousands of trees were killed outright or severely injured during those severe winters which have been popularly called "test winters." The first recorded test winter in Iowa, which did extensive damage, occurred in 1856. Test winters have occurred with more or less regularity since that time and can be expected to occur again. Past experience clearly indicates the folly of planting; for any purpose, those varieties which have proved over and over again their inability to withstand test winters. Baldwin, Esopus, Yellow Newtown and many others have repeatedly failed in
Iowa. Other varieties such as Northern Spy, even tho the trees may thrive, have been generally unproductive in most localities because of tenderness of fruit bud or because of other factors not well understood. "Hardiness," as defined by Beach,* "is the ability of a tree to endure climatic environment with practically no injury to either root or top."

**IOWA IS DIVIDED INTO DEFINITE FRUIT DISTRICTS**

It became apparent as early as 1860 that Iowa was divided into two horticultural sections, southern and northern, because of climatic and soil conditions. For general purposes, a line can be extended across the state, passing a little north of Des Moines and turning upward as the Mississippi and Missouri rivers are approached, south of which a number of winter apples of standard quality can be grown profitably, both in the home and commercial orchard. North of this line, in a general way, only the hardiest varieties are reliably productive. Unfortunately, these are nearly all summer and fall sorts, with the addition of a few winter varieties which are not of standard market quality and style.

Southern Iowa is in the northern limits of the winter apple belt. For this section such varieties as Jonathan, Grimes, De-

licious, Ben Davis, Gano, Willow Twig and Rome Beauty are quite successfully grown. These commercial sorts reach a high state of perfection and compare favorably with the fancy varieties of other regions that are in demand on the general and local markets of the country.

Northern Iowa is in the southern limits of the Wealthy belt, so-called because Wealthy is the most successful and widely known variety of the region. Along with Wealthy go Oldenburg, Yellow Transparent, Patten Greening, Northwestern Greening, Brilliant, Malinda and Salome. These are the varieties which must be largely depended upon for general planting.

Southern Iowa, Missouri and the Mississippi loess soils which cover southern Iowa are, in general, the soil types which are conducive to tree growth and production. The likelihood of winter injury becomes much less a factor than is the case on the heavier soils which prevail in northern Iowa. Perhaps no finer apple tree soil in the world can be found than the Missouri Loess in southwestern Iowa. North of Monona and Crawford counties, winter temperatures enter in to limit the favorable possibilities for successful fruit growing, even tho the same soil type extends northward. On the east, the Mississippi Loess soil is also well adapted to fruit growing. In general, commercial plantings of winter sorts cannot be recommended much north of Scott County. Westward, thru Cedar, Johnson, Iowa, Poweshiek and Jasper counties, the Mississippi

Fig. 3. Jonathan, Grimes and other high quality apples do well in southern Iowa.
loess soil type prevails and appears, from the horticultural experience of this section, to be moderately well adapted to growing most of those varieties found growing well in southern Iowa, provided attention is paid to the selection of favorable exposures. North of this tier of counties, tender varieties should be planted sparingly and only for home orchard purposes, as the chances for success diminish rapidly as they are planted farther northward.

For a considerable distance northward along the bluffs of the Mississippi River, specially selected, warm exposures have been utilized with profit by a number of commercial orchardists, who have been unusually successful in growing such varieties as Jonathan and Delicious even as far north as LaCrescent, Minn.

It must be borne in mind that those orchards which are successful in these northern latitudes have been judiciously located in relation to exposure, soil, air drainage, etc., and that the same latitudes on the prairies are not at all adapted to any but the hardiest varieties. Such special sites are often profitable financially because of an excellent local demand for winter apples of high quality.

**SPECIAL PRACTICES IN RELATION TO HARDINESS MAY BE VALUABLE**

Horticultural experience in Iowa indicates clearly that certain practices may be employed to advantage in growing half-hardy but otherwise desirable varieties some distance north of where they are naturally adapted. The most commonly accepted practice is to top-graft Jonathan, Delicious, Grimes and others which are more or less liable to winter injury on hardy varieties. Good results in preventing some of the most severe forms of winter injury on trunk and crotches are thus secured in central and northern Iowa, and even in southern Iowa, by the use of Virginia Crab and Hiberna as stocks. Other hardy varieties may be used, but none has as much favorable horticultural experience back of it as do Virginia Crab and Hiberna.

Other special practices which are beneficial are the use of manure, either barnyard or green, to provide at all times a generous supply of organic matter to the soil. This assists very materially in making the soil more retentive of moisture, which, in turn, reduces certain types of winter injury and promotes a vigorous, healthy growth which aids in the prevention of such diseases as blister canker (Illinois canker) and collar rot. Winter injury to the roots may be largely prevented by providing either natural or artificial soil mulches before winter weather begins. Suitable mulches can be secured by growing crops of buckwheat, rye or weeds during the late summer and fall, or by adding straw or manure as a top dressing.
DISCUSSION OF APPLE VARIETIES

The descriptions of the apple varieties listed herein are general and give practical information in regard to the peculiarities, faults and good features of each of the varieties discussed. Only the more important and valuable kinds are listed. Some of these are not recommended for planting, but attention is given them because they have been planted more or less generally and are still available from nurseries. Perhaps other varieties should have been included. Revisions, later on, will need to be made as new and better varieties are introduced and found adapted to Iowa.

In writing the following descriptions and discussions, the most authoritative sources of information were drawn upon, including the experience of practical growers and the records of the Annual Transactions of the Iowa Horticultural Society.

A few explanations as to flavor and quality ratings will assist in making clear what is meant by such terms as good quality, sprightly sub-acid, etc. Pomologists, in describing apples, have called attention to certain characters of flesh which can be compared. For instance, a variety may be coarse-grained, as is Ben Davis, or fine-grained, as is Grimes. Other variations may fall in between, or even outside these texture ratings and be rated as very coarse-grained, or perhaps medium coarse, if neither coarse nor distinctly fine. The flesh may be very juicy, or it may be distinctly lacking in juice, or fall in between these two extremes. The flavor may vary from sweet to sour with several grades of acid. Jonathan is rated as sprightly sub-acid; Ben Davis as mild sub-acid; Tolman is sweet, with no perceptible acid in the flavor.

Flavors are made up of degrees of acid, with other factors, such as the amount of intermingled sugar and aromas. Taken together, texture, juice, amount and type of acid, with the intermingled flavors, constitute what is generally called quality. Quality ratings run thru poor, fair, good, very good and best, with good as a center point. Ben Davis is often rated as good quality. Many varieties, therefore, as compared with Ben Davis, are rated very good or best. Varieties below Ben Davis, naturally are classed as poor or fair.

ARKANSAS (Mammoth Black Twig)

Healthy, vigorous and of good habit in the orchard, but in Iowa it has the general reputation of being an off-year cropper and a shy bearer. Fruit is susceptible to scab and often scalds seriously in storage. Can be planted in southern Iowa in a limited commercial way to supply local trade, but should not be planted north of Des Moines. Its reputation as a shy cropper is so well known that it is seldom included in the commercial planting lists in Iowa.
Fruit usually of large size; largely overspread with a dull, deep red color on a dull green undercolor; firm, crisp, juicy flesh of sprightly sub-acid flavor; quality, good; season, February to May.

BEN DAVIS, GANO AND BLACK BEN DAVIS

Discussed together because they are so similar in tree and in soil and climatic adaptations, differing mainly in color. Ben Davis and its kin have been losing favor for the past two decades. Because of its adaptability, attractive red color, excellent shipping and storage qualities, and the fact that the tree is an early and productive bearer, it has been a profitable sort, but like most other varieties of its season it is better adapted to those regions where there is a long growing season. In central and northern Iowa, it becomes smaller in size, more irregular in form, less highly colored, and inferior in quality.

In the old orchards of Iowa, Ben Davis is one of the leading varieties, having been planted liberally as far north as Ames and along the bluffs of the Missouri river as far north as Sioux City. From Des Moines south, it is one of the most productive commercial varieties. The stand of trees, however, in many orchards has been greatly reduced, due to winter injury and heavy production, which rendered the tree susceptible to the attacks of blister canker. This disease has been particularly destructive in nearly every part of southern Iowa.

As other varieties of much superior quality have come into prominence to take its place, the difficulty of disposing of Ben Davis is increasing year by year.

The varieties of the Ben Davis group average above medium size. Ben Davis is attractively colored with stripings and splashing of brilliant carmine over greenish yellow, while Gano and Black Davis are almost solidly covered with deep red. Gano has a brighter tone of color than Black Ben Davis. The flesh is white tinged with yellow, firm, coarse-grained, tender, lacks juice, mild sub-acid in flavor; fair quality; season December to May.

BRILLIANT

Originated as an open pollinated seedling of Fameuse by the late C. G. Patten of Charles City, Iowa. In northern Iowa it is larger than its parent, Fameuse, deeper red, and is good in quality. Resembles Fameuse in flesh characters with the exception of being a little more mild in flavor. Brilliant bears at an early age, is very productive, bearing good crops annually or nearly so. Tree does not attain large size, is stocky, vigorous and produces many short, thick-set spurs.

Fruit is medium to above medium size; uniform; deep self-colored red, attractive; flesh, tender, fine grained, moderately
juicy, mild sub-acid, quality good; season October to January if grown in northern Iowa; grown at Ames, it becomes a September apple. Suited for home orchards throughout most of northern Iowa and for limited commercial planting where there is a good local trade.

CHARLAMOFF

Exceeded by few varieties as to hardiness. Of Russian origin; a vigorous, strong grower; biennial cropper, bearing abundantly during the "on year." Fruit ripens unevenly, drops very freely and must be disposed of quickly when ripe; a good apple for dessert when at its best.

Fruit, of good size, rather irregular, splashed and washed with lively crimson over pale yellow; flesh, very tender, juicy, mild thin sub-acid; good quality; season, mid-August in northern Iowa. Of value for home orchard collection.

COLORADO ORANGE

Not well known and few nurserymen list it. In the station orchard at Ames and in several other localities north of Ames, the trees have been hardy and productive. Fruit bears considerable resemblance to Yellow Newtown in color, form and flesh characters, and keeps until late winter, even in common storage. Should be valuable as a late winter apple for central and north central Iowa, for home and for local markets.

Fruit, medium to above in size, or even large, oblate, somewhat irregular, ribbed; color, pale green turning to pale yellow as it ripens; fairly attractive for a yellow apple. Flesh, very firm, yellow, crisp, medium grain, juicy, sprightly sub-acid, good to very good quality; season, mid-winter to late winter.

DELICIOUS

Originated in Madison county, Iowa, and disseminated in 1895 under the name of Delicious. Because of excellent quality, large size and attractive color, it was very soon accepted, both by consumers and growers. Planted with success over a wide area and more or less extensively in Iowa, particularly in southern Iowa. The trees, under the systems of orchard management which often prevail in Iowa, have made satisfactory growth, but the consensus is that it comes into bearing rather tardily as compared with Jonathan; has shown some tendency to tenderness in fruit bud and has been only moderately productive.

With judicious cultivation, some Iowa growers have been able to secure early fruiting and satisfactory crops. Evidently Delicious requires for best development under Iowa conditions a cultural practice which conserves moisture and makes avail-
able a large amount of plant food material in the soil. Permanent sod evidently must give way to other types of cultural practices if best results are to be secured. Iowa grown Delicious are of good size, excellent quality and fine color and there is a ready market for all that are grown.

As a companion variety for Jonathan, perhaps Delicious is equal to any other for planting in Iowa where Jonathan does well, provided proper culture is given. Commercial plantings should be confined to southern Iowa for safety of investment. Delicious is a good orchard tree when properly trained, being vigorous and moderately hardy. The fruit is susceptible to apple scab which can be controlled by proper spraying.

Delicious is a very popular variety and assists in building up a strong local demand for other varieties where fruit is sold at the orchard during harvest time. Iowa grown Delicious keep well in cellar storage until December or January and in cold storage until April or later.

Fruit, large, attractive, lively red-striped, very tender flesh, mild rich sub-acid, aromatic; quality very good to best for dessert, and an excellent market sort.

**RED COLOR SPORTS OF DELICIOUS**

Delicious is one of the leading varieties being planted commercially in Iowa during the past 10 years, and attention is directed to its red color sports. There is reason to believe that these sports will thrive as well under Iowa conditions as does Delicious.

**Richared**

Richared originated in Washington in a block of 450 trees of Delicious. In this case the whole tree sported to the red type. It is described as a full red Delicious type, and is said to be identical with Delicious in type of tree, size, form and quality of fruit. The full red color develops two to three weeks in advance of color development on Delicious. This is an evident asset.

**Starking**

Starking is a red bud sport of Delicious. The fruit develops full red color early in the season, and can be picked early enough to prevent overmaturity on the tree and subsequent mealy breakdown. Starking, according to authentic reports, differs from Delicious only in color. There is no recorded evidence that the tree characters have been changed, while the fruit is of the same size, shape, flavor and season as Delicious.
FAMEUSE

Some of the largest and oldest trees found in Iowa which have survived the many test winters are of this variety. For the home orchard it has retained its popularity, but for commercial planting it demands expert handling in order to grow it free of scab, to bring it to good market size, and then to harvest is successfully. Commercially it is better adapted to portions of New England and Canada than to Iowa. For the home orchard in central and northern Iowa, Fameuse is one of the best of its season.

Tree is hardy, healthy, productive, long lived, upright, roundish-spreading habit, becoming dense if not pruned properly. Fruit is attractive, bright red, striped with deeper tones of red. The flesh is moderately firm, very tender, fine-grained, crisp and juicy, aromatic; very good quality for dessert. Season, October to December, or later in cold storage.

GOLDEN DELICIOUS

This is a new yellow apple of considerable promise. Yellow apples have been generally less popular than red varieties. Grimes Golden does well in southern Iowa but has a number of serious defects, both in tree and in fruit. A good, yellow apple with wide adaptation has long been sought to take the place of Grimes. Golden Delicious has been introduced recently as such an apple. It originated as a chance seedling in West Virginia.

A number of trees have been planted in various parts of Iowa, but the variety is too new to recommend with confidence for extensive planting in any part of the state. Commercial growers in various sections of southern and south central Iowa, after 8 to 10 years of experience with it, are not yet in agreement as to its value for extended commercial planting. Some growers see in it a new apple of much promise. In general, Golden Delicious finishes with good size, but very often under Iowa conditions its appearance and keeping quality are marred by the development of numerous large, irregularly shaped lenticels (dots). It is also susceptible to injury from spray materials. It has proved to be an excellent variety in cold storage, but in cellar storage it shrivels badly. The tree is a well-formed, vigorous grower, at least on certain soils, and bears unusually young. The fruit is large on young trees; a beautiful, clear-skinned yellow, with firm, crisp, juicy, mild sub-acid flavor, aromatic, very good quality. It has a late season, is worthy of planting in nearly every home orchard, particularly in southern Iowa, and deserving of trial in commercial plantings.
GRIMES

Grimes is the most popular yellow apple in Iowa. It is an old, well-known sort, of high quality for dessert and for culinary uses. Tree regularly productive and does will wherever Jonathan thrives, altho perhaps a little less hardy than Jonathan, shorter lived, and often disastrously susceptible to collar rot after the tree reaches bearing age. In Iowa and Illinois, blister canker has wrought havoc with Grimes trees which have been weakened by overproduction and winter injury. Losses from collar rot on Grimes can be eliminated by use of hardy stock. Virginia Crab and Hibernal have proved to be well adapted as a stock for Grimes, producing trees which are longer lived and even more productive than trees grown in the ordinary way. Nurserymen have recognized the value of hardy stock for Grimes and double worked trees are available.

Grimes often runs a little small in size, particularly on old trees. It is subject to storage scald and internal breakdown which often cause considerable commercial loss. Commercially, Grimes is in strong demand where yellow apples are in favor; for many years a close rival of Jonathan for profit among Iowa growers. It has lost some prestige because of the growing demand for red apples and because of ravages of collar rot. Notwithstanding, Grimes is a profitable variety, thriving well throughout southern Iowa. A general favorite for the home orchard, but cannot be planted with much certainty of success north of Des Moines, except in specially selected sites where soil is friable, warm and well drained.

Fruit, medium size; clear attractive yellow; very tender, fine grained, juicy flesh, mild rich sub-acid; ranks very good to best in quality; late fall and early winter.

JONATHAN

The Jonathan is the most popular apple grown in Iowa. Its handsome red color, high quality, both in and out of cold storage, and the comparatively wide adaptation of the tree have made it one of the most cosmopolitan varieties. The quality of Iowa-grown Jonathan is so well known that it is its own sales agent.

For southern Iowa, no variety is better adapted to commercial culture than Jonathan; does particularly well on well drained, deep friable soils, such as the well known Missouri, Mississippi and southern Iowa loess soils.

The tree is productive and satisfactorily hardy and long lived for commercial planting in southern Iowa. It is subject to winter injury, if the cultural practice employed does not provide a soil mulch. Fire blight in all its forms is occasionally
serious where high cultural conditions promote too succulent growth. Jonathan is, however, nearly free from blister canker and collar rot. Fruit is quite easily kept clean of scab and apple blotch, altho subject to "Jonathan spot," internal breakdown and soft scald under certain storage conditions. But notwithstanding these defects, Jonathan is one of the most profitable varieties now grown in southern Iowa. Iowa-grown Jonathan when well finished, carefully handled and stored at proper temperatures can be held in cold storage until Jonathan from other sections are off the market.

For the home orchard, and in specially selected and adaptable sites, Jonathan can be recommended for central Iowa, and northward along the bluffs of the Missouri and Mississippi rivers where warm exposures and friable soils are available. In the prairie regions of central Iowa and northward, Jonathan becomes less and less satisfactory, suffering severely at times from winter injury. By the use of hardy stock, some forms of winter injury may be avoided, but even so, it cannot be recommended for commercial planting in this region.

Fruit is of medium size, smooth and symmetrical; bright deep red or carmine extending over most of the surface. Flesh, firm, crisp, very juicy, sprightly rich sub-acid, quality very good to best; season, late fall and winter.

**KING DAVID**

Does well wherever Jonathan is successful. The tree is vigorous, healthy and productive; blooms late and often escapes frosts which seriously reduce the crops of many other varieties; hardier than Jonathan in tree.

At its best it is nearly equal to Jonathan in quality, but for storage is not so satisfactory and should be used by Christmas. Subject to water core and may become mealy and dry in storage. Satisfactory for home orchard planting and, to a limited extent, may be planted commercially as a companion variety to Jonathan because of its ability to set crops when Jonathan may fail because of frost.

The fruit is medium in size, decidedly attractive in color, solid deep red or carmine extending over the entire surface. It averages a little smaller in size than Jonathan which it resembles in form, tho somewhat more inclined to be conic. Flesh very tender, juicy when prime, sprightly sub-acid with a rich aroma; quality very good; season, October to December.

**LIVELAND**

An old-time sort. Hardy even in northern Iowa, but generally unproductive, tho vigorous, healthy and long lived. Fruit of good size, oblate, with a whitish skin overspread with
an attractive pinkish mottled red. Flesh, very tender, juicy, sprightly aromatic, quality very good; season, August. Fruit ripens unevenly and drops badly.

McINTOSH

Popular where well adapted because of its fine red color and high quality, but not satisfactory in most sections of Iowa because it is slower to come into bearing and is a more uncertain cropper than in many other sections where it is better adapted. While the tree is quite hardy, even in northern Iowa, the summer heat is too intense to bring the fruit to satisfactory maturity. The fruit is apt to run irregular in size, ripen unevenly and drop freely several weeks before ready for harvest. In a season which is rather cool, accompanied by well distributed rainfall, McIntosh matures a crop of fruit which is of good size and excellent color for the variety. It is suggested that McIntosh is better adapted to northeastern Iowa since it is grown to near perfection just across the Mississippi River in Wisconsin in the vicinity of Gay Mills.

Fruit, medium or above in size, smooth and symmetrical, color nearly solid bright red over most of surface; flesh moderately firm, white, very tender, fine grained, very juicy, spicy, aromatic, very good quality; season, late fall to mid-winter.

MALINDA

Doubtless the hardiest winter apple grown in Iowa. Old trees attain large size and show little or no winter injury of consequence. Very productive, often quite small in size. Mainly of value for the home orchard in north central and northern Iowa; not good enough in quality to compete with standard varieties on the general markets of the country, but should be included in the home orchard where other winter varieties are not satisfactory.

Fruit, medium size when well grown; clear golden yellow in color, with a bright pinkish blush. Flesh firm, coarse grained, toughish, lacks juice, mild, nearly sweet; fair quality; season, late winter.

NORTHWESTERN GREENING

Quite liberally planted throughout the Middle-West and often a "money-maker" because of its generous production, but like Ben Davis it lacks high quality and does not meet competition well when there is a large crop of high quality apples to be marketed. It has found favor with hotel and restaurant trade because of its excellent baking and culinary qualities.
Recommended for planting commercially throughout southern and central Iowa, but in less numbers than Jonathan, Grimes, Delicious or Willow, and perhaps some other varieties, depending largely upon the particular locality. For northern Iowa it is well adapted to home orchard collections, but should only be planted commercially where favorable exposures and warm, friable soil types are available. On flat, heavy soil, it is apt to be a shy cropper.

The tree is hardy in central and southern Iowa and in favorable locations in northern Iowa, vigorous, regularly productive if given proper culture; subject to limb breakage, susceptible to blister canker. The fruit often lacks uniform size, and if not well grown is poor in quality. When carefully harvested it is a good storage apple. Soft-scald or internal browning of the fruit is sometimes serious in storage. In southern Iowa, the fruit must be sprayed thoroughly for the control of apple blotch.

Fruit, large, greenish yellow or yellow; firm, coarse grained, moderately juicy, mild sub-acid, good quality; season, late fall and winter.

OLDENBURG (Duchess)

A pioneer among Russian varieties; and the outstanding variety of its season as a commercial and home orchard sort. Tree, does not assume large size and needs little pruning when in full bearing; tends to overload in alternate years, hardy in any part of Iowa. Commercially, planted to some extent in southern, central and northern Iowa. Southern Iowa Oldenburg are usually ready for market early in August. The season runs progressively later northward, and at Charles City, it is ready for market from Aug. 20 to 25.

Oldenburg is difficult to handle commercially; it drops badly, ripens quickly on the tree, does not stand heat well, and goes down rapidly after being picked. If it can be packed and promptly placed in iced refrigerator cars, it reaches market satisfactorily; otherwise, there is apt to be loss due to overripeness and to scald.

It is an open question whether Oldenburg should be planted in Iowa at this time except for home use. Due to excessive plantings in other sections, consider carefully future market conditions before planting more Oldenburg than can be sold locally.

Fruit, medium size; attractively red-striped; tender, juicy flesh; a little too acid for dessert. As a culinary sort, it has no superior in its season.
OLIVER (Senator)

Primarily adapted to south Central and southern Iowa; keeps well into the winter; but little better in quality than Ben Davis. Tree bears quite early, is nearly equal to Jonathan in hardiness and is productive. Fruit hangs well till mature; is medium to large in size; deep red; flesh firm, medium to fine grain, crisp, moderately juicy, mild sub-acid, becoming very mild as it ripens; quality, good; season, mid-winter or later.

PATTEN (Greening)

A valuable fall apple where climatic and soil conditions are not suited to growing the better quality sorts. For the home orchard on the open prairies of northern Iowa, Patten Greening will succeed where most other varieties fail. Few varieties equal it in hardiness. Tree is strong growing, healthy, spreading and productive, but often comes into bearing rather tardily, depending on soil and exposure.

Fruit, large; a clear pale green, often faintly but attractively blushed; flesh tender, coarse grained, sub-acid, fair quality; season, September, later in season when grown in more northern latitudes; a good culinary sort but difficult to dispose of in commercial quantities when the crop of other varieties is ample for market demands.

RALLS

An old-time favorite which is giving way to larger, more stylish apples of its season. Hardy in southern Iowa and does rather well as far north as Ames. Primarily adapted to home orchard; lacking sufficient size and color for commercial planting, requiring too much effort in thinning, pruning and fertilization to secure fruit of good marketable size and color. Fruit, generally small; green, or dull greenish yellow with more or less dull red striping, not attractive. Flesh, firm, moderately fine, moderately tender, somewhat crisp, juicy, agreeably sub-acid, aromatic, good to very good quality. Season, late winter and spring; often shrivels in cellar storage.

ROME

Apparently rather well adapted to the friable, warm and retentive soils of southern Iowa. Tree is productive, moderately hardy, comes into bearing quite early, is a late blooming variety, but requires a long growing season for best development and is therefore not well adapted to central or northern Iowa. It has done well enough in a number of southern Iowa orchards to suggest that it has commercial possibilities in that section of
the state. It is well and favorably known on the market. Several important red color sports of Rome should be investigated for planting in Iowa. These are known under several names, as Gallia Beauty and Red Rome. These sports are being planted extensively in the Rome Beauty areas of other states.

Fruit, large when well grown; attractively striped and mottled with bright red; firm, rather coarse grained, moderately juicy, becoming dry and mealy when over-mature, mild sub-acid, ranking in quality with Willow; prime in January and February or later in good storage; in demand on the market because of its excellent size, good color and late keeping qualities.

SALOME

Quite hardy, usually productive on right soils and perhaps one of the most popular winter apples grown in northern Iowa, but lacks sufficient style and quality to make it profitable except for local markets. The crop often lacks uniformity in size and much of it may be unattractive in appearance because of poor color. The fruit shrivels badly in cellar storage, but keeps fairly well in cold storage until May or later. The tree is an early regular producer, becomes dense with age, and needs pruning in order to keep the tree open and to stimulate color. Salome is found growing well on a wide range of soils, but succeeds best on the lighter types. It can be grown to the northern boundary line of Iowa, but is not so well adapted at that latitude as farther south. Salome can be safely planted in the home orchard collection and is especially recommended for central and northern Iowa where other winter sorts fail because of lack of hardiness.

Fruit of medium size, striped and mottled with pinkish red or carmine color over most of the surface; somewhat coarse, crisp, juicy, sprightly sub-acid, good in quality; season, winter.

STAYMAN

An important variety in some of the leading apple growing sections of the United States. It has been recommended and quite extensively tested in southern Iowa as far north as Des Moines. Those who have grown it recommend it with reservations. The tree is not equal to Jonathan in hardiness in Iowa and, even in southern Iowa, may suffer extreme winter injury before reaching bearing age. The fruit often fails to develop good red color, and is subject to cracking around the stem end as grown in most locations in Iowa. Growers are not all agreed as to its commercial value, but the general opinion is that Stayman is too tender for Iowa orchards. A
tree or two for the home orchard collection would not be amiss.

Fruit, when well finished, medium to large; attractive tho rather dull red with varying shades or obscure striping. Flesh, fine grained, juicy and tender, sprightly sub-acid, and ranks good to very good in quality; season, winter to late winter.

WEALTHY

The most popular variety of its season now grown in Iowa. Widely disseminated thruout the leading apple-growing regions of the United States and Canada; in some northern sections the most important commercial variety of the region. It ripens in August and September, depending largely upon latitude and altitude and, if properly handled, is a good storage variety with commercial limits extending to Christmas.

It is best adapted for commercial purposes to central and northern Iowa. Its commercial season in southern Iowa begins two weeks in advance of northern Iowa, but southern grown Wealthy cannot be stored as safely as the northern grown, as the fruit lacks firmness and good color. Before making extensive plantings of Wealthy or other varieties of its season, consider carefully the commercial production of other regions which have already planted heavily to this variety.

Wealthy comes into bearing rather early; bears abundantly, often overloads, producing undersized and undercolored fruit. This may be corrected by proper pruning, thinning and by paying particular attention to keeping up soil fertility. The fruit ripens unevenly and often drops freely. It is necessary for commercial purposes to make several pickings in order to save the entire crop and to put on the market uniformly well finished fruit.

Tree, quite hardy, does well in all parts of Iowa; subject to crotch and trunk injury during severe winters. Also subject to fire blight in all its forms, often suffering severely in seasons when succulent growth is induced by an unusually rainy season. In spite of these defects in fruit and tree, Wealthy is the best apple of its season for both the home orchard and for commercial purposes.

Fruit, medium to large; a beautiful red color when well grown. Flesh is agreeably tender, very juicy; sprightly and refreshing; good to very good quality; normal season, September, but keeps for several months longer if carefully harvested and placed in cold storage immediately.

WHITE PIPPIN

Similar in many respects to the famous Yellow Newtown, but the tree is hardier under Iowa conditions. Grows well on most
of the soil types found in southern and central Iowa and is said to be quite productive, even in certain localities in northern Iowa. White Pippin has not been planted extensively, even as a variety for the home orchard in Iowa, but where it has been tried, has given satisfactory results. It should be given a trial in every home orchard where the soil is at least reasonably well drained. White Pippin deserves more attention in Iowa because of its late season.

Fruit, medium to above in size; a good clear greenish-yellow color; firm, crisp, juicy, sprightly sub-acid flesh; quality very good; season, mid-winter to late winter.

**WILLOW (Willow Twig)**

Pretty, generally known in the Middlewest for nearly 50 years; rather extensively grown in Illinois and Iowa, and generally productive, producing fruit of large size, which handles well for commercial purposes. The fruit, while not highly attractive, brings good prices out of cold storage in the spring after most other varieties have gone, and has yielded a profit where many other varieties have failed to do so earlier in the season. In cold storage it is one of the best keepers and almost entirely free of storage scald. The tree is perhaps as hardy as Jonathan. It becomes very large as it attains age; few varieties are more productive in the Middlewest. For commercial purposes, Willow is best adapted to southern Iowa and is generally found to do well where the soils are deep, rich, friable and well drained. It is of value for the home orchard in central and southern Iowa.

Fruit, when well grown, moderately attractive in color, more or less blushed and mottled with red and irregularly striped and splashed with deeper red. Flesh, firm, coarse, moderately tender, juicy, sprightly sub-acid; quality good.

**WINESAP**

Not so well adapted to commercial culture in Iowa as a number of other varieties. Tree is perhaps half hardy, or less, comes into bearing tardily, but when it has reached full bearing age, is productive to a fault, which often results in a high percentage of small fruits. Fruit should be thinned on the trees, as is done on the west coast, in order to bring the size up to standard for commercial purposes. It should be planted only on friable, rich, well drained, warm soils. Must be thoroly sprayed for the control of scab. For the home orchard, one or two trees are generally acceptable and can be planted safely wherever Jonathan does well.

Fruit, attractive deep red, with very firm flesh and stands well as a commercial storage variety, keeping well into March
and April; of good to very good quality and destined to be valuable and popular sort for many years.

**WOLF RIVER**

One of the Russian type of varieties which originated in Wisconsin and one of the largest apples of its season. Popular for local trade because of its large size and good culinary quality. Often brings good prices, merely because of its good size, but cannot be relied upon to do so when there is a large crop of higher quality apples available. Tree, hardy and vigorous, wide spreading, often subject to fire blight, moderately productive in southern Iowa, but sometimes a shy bearer in northern Iowa. Fruit tends to drop freely, often ripens unevenly, and has only a short season of usefulness.

Fruit, large to very large; fairly attractive, clear pale yellow or greenish, mottled and blushed with bright deep red; flesh rather coarse, juicy, tender, sub-acid, fair to good quality; season, September, later if kept in cold storage.

**YELLOW TRANSPARENT**

Of particular value for the home orchard and may be grown for local markets in a limited way to meet the demands for summer apples. Hardy in nearly all parts of Iowa, but not equal to Duchess in this respect. The tree is of good habit, slow growing after reaching bearing age, often a biennial bearer, frequently over-productive, producing small unmarketable fruits unless it is thinned.

Fruit, clear pale yellow; flesh very tender, juicy, fine grained, sprightly sub-acid, good quality, ripens unevenly from late July thru August, depending upon latitude. Fruit is easily bruised, does not remain in good condition very long and must be consumed promptly when ripe. A desirable sort for the home orchard and often profitable in a small way on local markets.

**CRAB APPLES**

**Whitney**

A well known sort; hardy in any part of Iowa. Tree upright in habit; productive; fruit of good size; bright red, striped; very tender, juicy flesh, sprightly sub-acid, aromatic and very good to best quality; season, August and September. A leading crab for any home orchard and often valuable for local markets.

**Transcendent**

An old sort, hardy in central and southern Iowa, and moderately so in northern Iowa. Of medium size; greenish or yel-
low with reddish blush and stripe; firm fleshed, juicy, sprightly sub-acid; excellent for jelly. Season, late August to mid-September.

**Martha**

Originated by Peter M. Gideon, Excelsior, Minn. Fruit, large: bright, attractive red over pale yellow; flesh of excellent flavor and quality; season, September, October or later.

**Virginia**

A large free growing tree, and because of its hardiness and resistance to blight it is one of the best crabs for planting in Iowa. The fruit is above medium in size; firm fleshed and good quality.

**NEW APPLES ORIGINATED AND NAMED BY IOWA AGRICULTURAL EXPERIMENT STATION**

The Pomology Section of the Iowa Agricultural Experiment Station is seeking to develop hardy red winter apples which will be adapted to general planting and measure up to standard quality and style for commercial purposes. Reliably hardy red, winter apples are greatly needed in central and northern Iowa, and one of the purposes of the station is to breed fruit better adapted to that section of the state. Hardier,
late keeping apples of the Winesap type are also much needed in southern Iowa. A Jonathan type of apple of larger size, free of "Jonathan spot" and storage scald, produced by a tree resistant to blight and cedar rust is also greatly needed in Iowa. This work in breeding was initiated by the late Prof. S. A. Beach, in 1905. A considerable number of cross-bred apple, pear and plum seedlings of known parentage have been grown and fruited at Ames and at Charles City. From these, the best have been selected for further breeding, and 11 apples, one plum, and one pear, have been named for distribution and trial. Scion wood of the selected seedlings has been distributed widely for trial. Nurserymen of Iowa and of other states have received scion wood of the most promising ones. Those who wish trees of the new varieties can secure them from a number of Iowa nurserymen.

It should be distinctly understood that the new apples are not recommended except for trial plantings. They have been fruited in various parts of Iowa and other states. Observations to date are limited, and sufficient information has not accumulated to warrant any extravagant claims for them. Of these new apples Ames, Edgewood, Sharon, Secor and Hawkeye Greening, have compared favorably in production at Ames with standard sorts, such as Jonathan, Grimes, Ben Davis and Northwestern Greening.

Fig. 5. The Ames apple is worthy of further trial. It is a late winter variety of fair size, fine red color and of good quality.
Fig. 6. Edgemoor (Salome x Jonathan) is a red winter apple of very good quality, and appears to be worthy of extended trial wherever Jonathan does well.
In addition to the named sorts, a few additional ones of merit are sent out to orchardists under Ames numbers, with the understanding that the station reserves all rights to name and introduce those which prove worthy later on.

Following is a brief description of the new apples which have been originated and named by the Iowa Agricultural Experiment Station:

**AMES (Allen Choice x Perry Russet)**

A regular bearer since coming into fruiting in 1920. The fruit is of good quality and keeps until May in cold storage. The tree is healthy, vigorous and fairly productive at Ames; it is of good habit in the orchard and makes an excellent strong-growing nursery tree. Limited trial indicates that Ames is adapted to southern Iowa, where it attains large size, and good deep red color. It requires longer season for full development than is afforded it in northern Iowa, altho the tree has shown evidence of being quite hardy. The fruit shows susceptibility to scab and appears to need careful spraying for its control.

Fruit, medium size, quite uniform. Form, roundish oblate, inclined to conic, smooth and symmetrical, almost entirely overspread with a bright, tho deep tone of red, attractive. Skin, medium thick, smooth and firm enough to stand ordinary handling without injury to the fruit. Flesh, firm, yellow, crisp, sprightly sub-acid, becoming milder in acid as it advances in season. Quality, good to very good. Season, January to May.

**EDGEWOOD (Salome x Jonathan)**

Favors Jonathan in general form, color, flavor and is nearly equal to Jonathan in quality. The indications are that Edgewood is somewhat larger in size than Jonathan and has the advantage of Jonathan in being later in season by six weeks or two months, keeping well in cold storage until March or April, and has shown none of the common storage defects of Jonathan. The tree is a poor grower in the nursery, and is deficient in hardiness as a nursery tree. For this reason it will likely not succeed in Iowa, altho top-worked on Virginia Crab it has grown rather well in the station orchards at Ames.

Fruit, medium size to above. Form, roundish, smooth, regular and symmetrical, favoring Jonathan. Color, attractively overspread with a lively tho medium tone of red, and obscurely striped; nearly equal to Jonathan in color. Skin, smooth, medium thick, covered with a thin lilac bloom. Flesh, firm, yet tender, crisp and juicy, sprightly sub-acid, rather rich, favor-
ing Jonathan in flesh very markedly; quality, very good; season, January to April.

SECOR (Salome x Jonathan)

An attractive, medium red apple of good uniform size. The original tree appears to be hardy and healthy and is moderately productive. The fruit hangs extremely well until fully matured, and requires a growing season fully as long as Jonathan. The fruit, medium to above medium in size. Form, oblate, inclined to conic, with a wide flaring cavity, regular and quite symmetrical. Color, pale green or yellowish, largely overspread with a medium bright tone of red with more or less obscure striping and mottling of deeper tones of red. Skin, firm, rather thick and will stand ordinary handling without injury to the fruit. Flesh, very firm, crisp, medium to fine grained, juicy, rich sub-acid; quality, very good; season, January to March or later.

Secor is good enough in tree and in fruit to recommend it for trial wherever Jonathan does well and on northward. In storage, it is free from soft scald and Jonathan spot. There is evidence that Secor is hardier than Jonathan. It is a fair tree in the nursery, but as an orchard tree is free growing, and on Virginia Crab is a rapid grower.

HAWKEYE GREENING (Vermont Seedling Unguarded)

The original Hawkeye Greening tree is of spreading habit, forms an abundance of fruit spurs, has good, large foliage and bears abundantly and regularly. Makes an excellent tree in the nursery. Hawkeye Greening is a large clear-skinned yellow or greenish-yellow apple, often having a pinkish blush. Of the Rhode Island Greening type, it is a little less symmetrical in form, but clearer in tone of color.
Fig. 8. Hawkeye Greening is the most productive of the new varieties originated at Ames. Uniformly large, an excellent sort for culinary purposes. It is probably very desirable in area 3. The season is from December to March.
Fig. 9. Sharon will meet the demand for an attractive red apple of very good quality. Season, December to March. It is the best of the seedlings of McIntosh and Longfield.

Fruit, above medium to large in size. Form, oblate, inclined to conic, broadly ribbed; color, clear, pale yellow or greenish-yellow, often with pinkish blush. Skin, medium thick, takes polish. Flesh, fine grained, juicy, very tender, sprightly sub-acid; is good as a dessert apple and exceptionally fine for culinary uses, especially for baking.

The fruit is in season from the latter part of October until March, and is a remarkable keeper, keeping well in storage for several months after it has reached prime maturity. The vigor, productivity and apparent hardiness of the tree suggest strongly that Hawkeye Greening has considerable merit for northern planting. Tests in northern Iowa to date indicate that it is hardy, productive, an early bearer, that the fruit finishes perfectly and is a good keeper.

SHARON (McIntosh x Longfield)

Tree and fruit considered, Sharon is easily superior to any of the old standard winter apples now grown in northern Iowa. As a winter apple it will find a ready welcome in the home orchards of this region, and it is also suitable for limited commercial plantings.

The fruit of Sharon is attractively striped with red over yellow and has a rather rich, pleasing, aromatic, mild sub-acid flavor, and it rates very good both for dessert and culinary purposes. The fruit hangs to the tree until fully mature and is ready to pick at Ames about the middle of September. When well grown, the fruit is remarkably uniform in size and color and keeps well in good cellar storage until March.

Fruit, medium to above in size; uniform. Form, roundish, oblate, slightly inclined to conic, very smooth, regular and symmetrical. Color, largely overspread with an attractive bright tone of red or carmine, and distinctly striped and mot-
tled over most of the surface with contrasting yellow color showing thru toward the apex. Skin, rather thin and tender, takes a fine polish. Flesh firm, yet very tender, fine grained, breaking, juicy, aromatic, mildly rich sub-acid flavor; quality, very good. Sharon is a trifle mild for those who like sprightly sub-acid types such as Jonathan.

Since its introduction in 1922, Sharon has been under test in many sections of Iowa, Minnesota, South Dakota and to a lesser extent in other states. In these tests it has shown a high degree of hardiness. In the orchard the tree makes a remarkably strong, vigorous growth and is healthy and productive. In the nursery it is easily grown and produces a fine, strong, shapely tree.

MACY (Northwestern Greening x Wealthy)

Fruit, above medium to large in size. Form, roundish, inclined to conic, favoring Northwestern Greening. Color, pale green or yellow, striped and mottled with a bright tone of red and favors Wealthy. Skin, medium thick, medium tough, slightly waxy. Flesh, resembles Wealthy in firmness, texture, grain and amount of juice, sprightly, pleasant sub-acid; quality, good to very good.

Macy is an excellent nursery tree. The fruit is large and good quality, but it drops freely and for this reason it appears to be of doubtful value, at least as grown at Ames. It may have value in other locations.

MONONA (Wolf River x Harrington)

Reports from a number of cooperators show Monona to be hardy and productive. It is gaining favor because of its large size, attractive red color and good quality. These characteristics commend it for limited commercial and extended home orchard planting in central and northern Iowa. Its normal cellar storage season is from October to January.

Fruit, above medium to large or very large in size. Form, roundish, inclined to conic, distinctly oblique, compressed. Skin, smooth, except for the presence of rather large dots, thick, rather tough. Color, pale green, self-colored, nearly solid red and obscurely striped and mottled with a medium deep tone of red. Flesh, tender, medium grain, smooth, juicy, mild, pleasant sub-acid, intermingled with a peculiar perfumed flavor; season, October to January.

Tree is healthy, vigorous, fruit hangs well until mature. The fruit sometimes clusters rather badly and may need thinning for best development.
MAUD (McIntosh x Longfield)

An August apple of good size and very good quality. This is a clear skinned, very attractive bright red apple with more or less obscure striping and mottling of carmine. It averages considerably larger than Red June and follows that variety in season as grown at Ames. The flesh is white, tender, medium grained, juicy, sprightly, pleasant sub-acid. The original tree appears to be vigorous, healthy and productive. It is worth trial as a red summer apple. A strong growing tree in the nursery row, and an early producer.

EARLHAM (Colorado Orange x Allen Choice)

Earlham is a large, clear skinned, yellow apple with a pinkish blush. The tree shows desirable vigor and hardiness in the nursery row and in the orchard.

One of our best cooperators in the Black Hills of South Dakota reports that Earlham is hardy and productive. The large attractively blushed fruits are firm fleshed, juicy, mild to nearly sweet and good quality. The season in cellar storage extends into April and May. No variety of its season is now available for northern Iowa, except Malinda which Earlham excels in size and quality. Earlham has merit for further trial plantings, particularly in the home orchards of northern Iowa to supply a late keeping apple.
OTHER NEW FRUIT VARIETIES

Fruit growing in America has made its most important advances thru the origination and introduction of new and better varieties. Productive varieties of better size, quality and of attractive color have appeared from time to time so that there has been a constant shifting of our variety lists. Fruit growers everywhere are still looking for better varieties. Iowa needs hardier red winter apples and varieties which are less susceptible to disease. Jonathan, Grimes and Delicious are the most important varieties in the commercial plantings of southern Iowa, but there is great need of later maturing varieties of better quality to supplement these in the commercial orchards of the state.

During the past 20 years many new fruit varieties have been originated and introduced. Some have already proved valuable either locally or nationally. Many will fail altogether. Only by extended trial is it possible to determine the value of any fruit. Local tests should indicate the value of any new variety pretty conclusively before large plantings are made.

A number of new varieties of apples have been little tested in Iowa. These are listed as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Descriptive Notes</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Mcintosh</td>
<td>Red, resembles Mcintosh in color and flesh.</td>
<td>Summer</td>
</tr>
<tr>
<td>Lodi</td>
<td>Like Yellow Transparent, but larger.</td>
<td>Summer</td>
</tr>
<tr>
<td>Milton</td>
<td>Attractive pinkish red, Mcintosh flesh.</td>
<td>Late summer</td>
</tr>
<tr>
<td>Macoun</td>
<td>Deep red, flesh like Mcintosh.</td>
<td>Late winter</td>
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</tbody>
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The above four varieties are seedlings of McIntosh, originated and introduced by the New York Agricultural Experiment Station, Geneva, New York, and the following are seedlings of Delicious also originated by the same station.

<table>
<thead>
<tr>
<th>Name</th>
<th>Descriptive Notes</th>
<th>Season</th>
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<tbody>
<tr>
<td>Medina</td>
<td>Delicious type, but larger</td>
<td>Winter</td>
</tr>
<tr>
<td>Newfane</td>
<td>Dark red, large size</td>
<td>Mid-winter</td>
</tr>
<tr>
<td>Orleans</td>
<td>Delicious type, but larger</td>
<td>Winter</td>
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</table>
TURLEY*

As an apple to take the place of Stayman, Turley is attracting favorable attention in the commercial apple growing sections of the Middlewest. Turley is a variety of the Stayman type, free of Stayman's most serious defects, such as lack of color and stem end cracking. It was originated at a seedling of Winesap by Joe A. Burton while he was superintendent of the Experimental Orchard of the Indiana Horticultural Society. Commercial plantings of Turley in southern Indiana are rather extensive and the results have induced considerable enthusiasm for this new variety. The tree is very vigorous and productive, is an open, free grower and has good foliage. Only recently has it been planted in Iowa, and as yet no records are available as to its hardiness. Observers are of the opinion that the tree is stronger and fully equal if not superior in hardiness to Stayman.

The fruit ranks large in size and resembles Stayman in form. The color is attractive solid deep red or nearly so. The flesh is yellowish, firm, crisp, tender, juicy, mild pleasant sub-acid and rates very good in quality; season, winter. The flesh characters and the flavor are quite similar to Stayman.

RED COLOR SPORTS IN APPLES

Red color sports in apples have been observed from time to time but have not attracted very much attention among practical growers until recently. The value of good red color as an asset in the market is recognized everywhere. Consequently, new varieties of superior red color which have developed as sports of the leading commercial varieties are commanding wide attention.

Apple varieties are very stable, and only rarely do they change in any way. In some varieties, sporting has occurred and in most of the cases which are on record the character most often affected is the color. If the sport "comes true" when propagated it is designated as a new variety. Some of the most important commercial apples have produced red color sports. It seems likely that these color sports will have far reaching effects upon the future of the apple growing in America and may in time supplant their less well colored parents and become leading commercial varieties. Orchardists should investigate all sports which are offered for sale before planting them extensively. Those which have proved stable, and do not revert to the parent type, and which prove upon propagation to be productive, and show no unfavorable changes

in size, flavor or hardiness and productiveness of tree, can be planted safely.

The red sports which have the most commercial value in Iowa are those of Delicious, Jonathan and Willow. The Rome sports are also of interest inasmuch as Rome as a rule does not develop satisfactory red color, but in other respects it is quite well adapted to southern Iowa.

The following is a list of the important commercial varieties which have produced sports:

<table>
<thead>
<tr>
<th>VARIETY</th>
<th>RED SPORT</th>
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<tbody>
<tr>
<td>Baldwin</td>
<td>Black Baldwin</td>
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<td>Delicious</td>
<td>Richared</td>
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<td>Delicious</td>
<td>Starking</td>
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<tr>
<td>Duchess</td>
<td>Red Duchess</td>
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<tr>
<td>Gravenstein</td>
<td>Banks</td>
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<td>Jonathan</td>
<td>Blackion</td>
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<td>McIntosh</td>
<td>Black-Mack</td>
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<td>Northern Spy</td>
<td>Red Spy</td>
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<td>Rambo</td>
<td>Red Rambo</td>
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<td>Rome</td>
<td>Gallia Beauty</td>
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<td>Red Spitzenberg</td>
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<td>Red Stark</td>
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<td>Blaxtayman</td>
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<td>Staymared</td>
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<td>Collamer</td>
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<td>Hitchings</td>
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<td>Red Willow</td>
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**PART II. PEARS FOR IOWA**

No pear variety of good standard quality has proved satisfactorily hardy, productive and blight-resistant in Iowa. As a result there are few commercial pear orchards in the state and even pear trees are not common. A few varieties have, however, shown a good degree of hardiness and resistance to pear blight. These can be grown reasonably well in southern Iowa if proper attention is given to the control of pear blight and if well drained soils are selected for the orchard location. Only the hardiest sorts can be grown at all in northern Iowa, but these generally are more or less inferior in quality.

Following is a list of varieties with brief descriptions, which is intended as a suggestive list of those perhaps best suited for Iowa. Several pear varieties should be planted together to insure fertilization of the blossoms.
ANJOU

A standard market pear for fall and early winter. It has few equals when well grown, either in appearance or quality of fruit. Yellow, marked with russet, with very tender, juicy, spicy, rich flavor. The tree is vigorous, relatively hardy and relatively free of blight, but not always a good cropper. Should only be planted in southern Iowa.

FLEMISH BEAUTY

Rather hardy in tree, productive, but very susceptible to scab and to pear blight. The fruit is of excellent quality, of September or October season. A pear for those who wish to secure choice quality fruits at the extra care and trouble necessary to combat scab and blight.

KIEFFER

Kieffer is moderately hardy in southern Iowa, less troubled by blight than most other sorts, and if given some attention, may be quite productive. Kieffer, while widely grown, is of poor dessert quality. Its chief merits lie in the fact that it is one of the best of all varieties for culinary and canning purposes. Well grown, Kieffer is attractive, greenish-yellow, with dull red or bronze cheek; flesh coarse, crisp, juicy, sub-acid; quality, fair; season, September and October. Kieffer succeeds and produces well in southern and south central Iowa.

SECKEL

Fairly hardy in central and southern Iowa. One of the highest in quality of all pears, but lacking in good size. What it lacks in size, it makes up in quality. The tree is vigorous, productive, moderately hardy and more highly resistant to blight than are many other sorts. It is smooth and well formed; reddish brown in color; with melting, buttery, juicy, richly flavored flesh of excellent quality; season, October. Valuable for home orchard collections in southern Iowa.

LINCOLN

A large fruited variety of hardy constitution. Has been reported as doing well as far north as Waverly, Iowa. Quite resistant to blight, and probably one of the best pears for the Mississippi Valley because of its ability to stand extremes of cold and heat.

The fruit is medium or above in size; yellow; firm, rather coarse, granular flesh, tender, very juicy, aromatic; pleasing, but not highly flavored; quality good.

Of value for trial in home orchard collections in central and northern Iowa.
WINTER NELIS

One of the standard winter varieties, ranking very high in dessert quality, but not particularly attractive in color. Top-worked on hardy pear stock, it is hardy and productive as far north as Charles City, but on its own stem, can be planted with safety only in southern or central Iowa. The tree is a scraggly, crooked branched grower, productive to a fault, often requiring thinning to bring the fruit up to standard size. The fruit is medium in size; well formed; russet, with delightfully tender, juicy, melting flesh, sweet and highly flavored; quality, very good to best.

A good variety to plant with other sorts for those wishing to try a few pears in the home orchard.

LONGWORTH

A native of Iowa, originated at Dubuque some years ago by the late N. K. Fluke. Its chief value lies in its extreme hardiness and blight resistance. The fruit is coarse grained and poor in quality, but will grow in those locations where other varieties are not sufficiently hardy. The fruit is of medium size; greenish or yellowish as it ripens; coarse in texture, sub-acid, moderately juicy; quality, poor; season. September, October.

NEW PEAR VARIETIES

Four new pear varieties are now available to those who wish to experiment. These are Beierschmitt, Mendel, Minnesota No. 1 and Patten. These varieties have qualities of tree and fruit which commend them for extended trial plantings throughout the Upper Mississippi Valley, where most standard varieties cannot be grown with certainty.

Only general statements concerning these pears are warranted until further experiment demonstrates their respective values.

BEIERSCHMITT*

This new pear deserves special mention because of its excellent size and quality. It originated on the farm of J. A. Beierschmitt near Fairbank, Iowa, about 1900, from seed of Bartlett planted by Marie Beierschmitt, the mother of Mr. Beierschmitt. The original tree bore at seven years of age. The exceellent quality of the fruit was noted and led to an effort to produce more trees by digging roots for transplanting, which finally resulted in the death of the original tree. Propagated trees now about 12 years planted have been healthy, productive and fully as hardy as Kieffer growing in the same orchard. Of recent years it has been quite widely disseminated.

for trial. Should the tree prove as hardy as it has been at Fairbank, Beierschmitt will be of great value for planting in Iowa. The fruit is above medium to large in size; resembles Bartlett in form except that it is broader and not so distinctly necked. Color, greenish yellow, becoming clear pale yellow when ripe, often flecked with thin pale russet. Skin, very thin and tender; flesh, firm, very tender, very juicy, aromatic, very mildly sub-acid; quality, very good to best and superior to Bartlett. Season, Sept. 15 to 25.

MENDEL

This pear originated at New Ulm, Minn. It is reported to be hardy and productive. The fruit is medium to above in size pyriform shape; color, dull, deep green and russeted, turning yellow as it ripens; flesh, tender, smooth, medium grain, juicy, sprightly sub-acid, agreeable pear flavor; quality, good; season, late September and October.

MINNESOTA NO. 1*

This pear originated at the University Fruit Breeding Farm Excelsior, Minn., from seed secured from Manchuria. It is regarded as hardy as far north as the Twin Cities and is only partially resistant to fire blight. The tree is above medium in size, fig. 11. The Patten pear is of good size, productive and very good in quality. It is worthy of trial in all parts of Iowa.

roundish pyriform in form; color is yellow and distinctly blushed; flesh, tender, medium fine grained, juicy, sweet, pleasant flavor; quality, very good; season, September.

**PATTEN (Orel 15 x Anjou)**

Since its introduction by the Iowa Agricultural Experiment Station in 1922, the Patten Pear has proved to be the hardest of all the large fruited pears. It has a record of withstanding temperatures of 35 to 40 degrees F. below zero without injury to the tree or fruit buds. The tree is a free grower, with an abundance of good healthy foliage, but is not entirely blight resistant, altho with reasonable precautions it can be grown successfully. The Patten has been successfully fruited in both Dakotas, Minnesota and in Canada. It is well adapted to planting in any part of Iowa and will produce fruit in most years. It blooms a little past mid-season. The blossoms are large, handsome, white, with a double corolla (10 petals) instead of the usual single corolla (5 petals).

The fruit when well grown is medium to large size, favors Bartlett in general form, smooth and regular; color, green, turning yellow as it ripens, often with bronze blush on exposed side. The skin is quite thick, but becomes thin and tender as it ripens. The flesh is very tender, very juicy, sprightly rich sub-acid, refreshing and very good in quality; flesh may become somewhat gritty if permitted to hang on the tree too long; season, September.

**PART III. PLUMS FOR IOWA**

The native American plum varieties, *Prunus americana*, thrive on a wide range of soil types, so long as drainage is reasonably good. Many varieties of this group are hardy and productive in all parts of Iowa. They are in general much less subject to brown rot than are either the pure Japanese, *Prunus salicina*, or Japanese hybrid varieties, but nevertheless require spraying. The pure americana varieties are rapidly disappearing and are being replaced by the larger fruited and firmer fleshed hybrid varieties. Many of the hybrids mature more evenly on the tree and are larger in size, but have the disadvantage of being quite susceptible to brown rot. It is very essential that a spray program be followed very closely in growing plums.

The pure Japanese varieties, *P. salicina* (triflora), are only moderately hardy in southern Iowa or in south central Iowa, but the Japanese hybrid varieties are generally hardy throughout the state. These hybrid plums, many of which have equal mix-
tures of American and Japanese blood, often partake of the hardiness of the American plum, but some of them bloom early and rot badly. The new plums are in general harder and can be grown further north than can any of the pure Japanese varieties.

The European sweet plums, *P. domestica*, are with few exceptions not reliably hardy in any part of Iowa. In southern Iowa on well drained rich soils, Lombard and occasionally Green Gage are found doing fairly well if planted on carefully selected sites.

The selection of varieties is largely a local problem and should be based not only upon local soil and climatic conditions, but also with respect as to whether the planting is made to supply home or market demands. The consumer in general demands large fruited varieties. *It is highly necessary to plant a number of plum varieties together to provide for cross pollinization of the blossoms. Nearly all plums are highly self-sterile and will not produce fruit when planted alone. It is suggested that at least four or six varieties be planted together.*

The following list of plum varieties is suggested for Iowa planting. Only brief notes are given for each variety. Plums vary greatly in size and quality as grown on different soils under varying systems of culture. Also, the plum variety situation has shifted so rapidly that it is difficult to give exact information in regard to many of the newer varieties as compared with the older sorts. Much testing of varieties in Iowa is still needed to determine just what varieties have a place in the commercial lists, but in home orchards quite a wide selection of varieties can be planted with confidence, and add much interest to the orchard.

**OLD VARIETIES**

**BURBANK** *P. salicina* (*triflora*)

No hardier than Abundance, but fruit of better size and quality. It is often found doing well in southern Iowa; blooms early in common with most of the Japanese varieties, and is subject to brown rot. Large of size; attractive, dark red over yellow; flesh, deep yellow, firm, tender, sweet; cling stone; quality, good.

**DE SOTO** (*americana*)

One of the hardiest of the American species; productive; fruit of medium size; red and yellow; flesh yellowish, cling stone; mid-season.

**MINER** (*hortulana*)

An old standard variety; hardy; moderately productive; fruit bright red; roundish; firm, juicy, good quality, late season.
OMAHA (americana x salicina)

Hardy in central or southern Iowa, and in special sites in northern Iowa; of large size, light red and good quality.

TERRY (americana)

Very large when well grown; ripens along with Stoddard; roundish; bright pale red over yellow; firm fleshed, a little fibrous, tender, sweet; good to very good quality; hardy; one of the best of the americana native plum varieties.

WILD GOOSE (hortulana)

Ripens in early August; an old and well known sort; hardy in central and southern Iowa; medium size, clear red, fair quality.

WYANT (americana)

An old standard variety; season September; fruit oblong; deep red color; flesh moderately juicy, sweet; fair quality.

PATTEN (americana x hortulana)

Originated by C. G. Patten, Charles City, Iowa, and introduced for trial 1918 as Patten 1301 by the Iowa Agricultural Experiment Station. Named and introduced by the station in 1923 under the name of Patten.

The original tree is still productive, and in good condition at the State Fruit Breeding Farm, Charles City, Iowa.

The tree is vigorous; wide spreading in habit, with healthy
bright but dark green foliage; not subject to shot hole fungus; blooming season, five to seven days later than most of the pure American varieties and thus escapes an occasional late frost. It should be planted along with other late blooming varieties to insure cross fertilization.

The fruit is large to very large; roundish, somewhat flattened at the ends; suture line indistinct; color, medium red. with lilac blooms, over yellowish ground color; flesh, very firm, meaty, juicy, a little fibrous, sprightly sub-acid, becoming sweet as it ripens. Quality very good; season, mid-September, as grown at Charles City. The fruit, unlike most of the American plums, does not run to small sizes as the trees become old. Fruit is almost free from brown rot.

The Patten plum is certainly hardy in northern Iowa, and equal to, if not superior, in size, color and quality, to any of the pure American varieties. Worthy of trial in any part of Iowa.

NEW HYBRIDS PRODUCED BY UNIVERSITY OF MINNESOTA FRUIT BREEDING FARM*

The Minnesota varieties are available from nearly all nurserymen of the Upper Mississippi Valley. The following varieties have been planted by various growers in Iowa and have gained favor because of their large size and fine appearance. The trees are hardy in most locations, but may not all be equally well adapted to all conditions. Further trials are needed to demonstrate those best adapted for planting in the various sections of Iowa.

ELLIO T

A large high quality late plum of pleasant flavor. It stands up well after harvest and is regarded as a good commercial variety. Tree, hardy, vigorous and regularly productive. Fruit, large, nearly round, red; flesh, yellow, firm, tender and juicy; stone nearly free; very good quality; late season.

HENNEPIN

A red fleshed plum especially recommended for canning. Tree, medium size, hardy, and productive; fruit, medium size, dark red with heavy bloom; flesh dark red, slightly stringy; quality, fair to good; early season.

LA · CRESCENT

Very attractive, yellow early plum of high quality. It has the fault of being a shy bearer, but is hardy. Tree, very vig-

orous; fruit, medium size, yellow; flesh, yellow, juicy, very tender, melting, sweet; quality, very good.

**MONITOR**

A hardy, vigorous and productive tree. Fruit very large, dull bronze red color; flesh, yellow, tender, very juicy, firm, sweet but acid around pit. Late mid-season.

**RADISSON**

A large showy red plum of very good quality, which ripens evenly on the tree and is well adapted for market purposes. The tree is a medium grower; fruit, large, roundish, red with blue bloom; flesh, firm, yellow, tender, juicy, sweet; quality, very good; season, early.

**RED WING**

A hardy, vigorous and productive variety. Fruit very large, light red; flesh, yellow, firm, moderately juicy, sweet; quality, very good; mid-season. Tests in Iowa show Red Wing superior to Tonka.

**TONKA**

A very productive variety. Rated among the best of the Minnesota hybrids. Tree medium in size, vigorous and productive. Fruit medium, light red, large; flesh, yellow, firm, tender, juicy, sweet; good quality; mid-season.

**UNDERWOOD**

The best of all the early plums originated at the Minnesota Station. The tree is very vigorous, and young trees are productive. The fruit ripens early and extends over a long season, a point of value for home use. Fruit, large, round conic; color, rich red; flesh, golden yellow, tender, juicy, sweet and of very good quality.

In Minnesota the new plum varieties have been placed in two lists, the most important varieties being Underwood, Tonka, Red Wing, Monitor and Elliot. The second list includes Hennepin, Radisson and La Crescent.

**MINNESOTA SAND CHERRY HYBRIDS**

Sand cherry hybrids of Minnesota station origin are Nicollet, St. Anthony and Zumbra. These sand cherry hybrids come into bearing at the second or third year after planting. The trees are dwarfish but hardy. The fruit is rather small but desirable for sauce and other culinary purposes. All are self-sterile and
should be planted with other sand cherry hybrids to insure cross fertilization of the blossoms.

**SOUTH DAKOTA AGRICULTURAL EXPERIMENT STATION HYBRIDS**

The Hansen hybrids originated by Dr. N. E. Hansen of the South Dakota Experiment Station have been widely planted throughout the Middlewest, and are popular because they are productive, bearing well at a few years in age in the orchard. Some of these varieties are very well suited to the northern half of Iowa. These varieties in common with most other hybrid sorts should be carefully sprayed for the control of brown rot.

**KAHINTA**

The tree is of Japanese type of growth and foliage. Has done well in northern Iowa. The fruit is large, roundish, dark red, tender, juicy, sweet and very good quality; mid-season. Kahinta is popular, and preferred to Waneta by those who have grown both in Iowa.

**WANETA**

A sister of Kahinta, popular as a home orchard variety because of its good size and productiveness. The fruit often needs thinning to prevent breakage of limb, and to produce large fruit. It must be sprayed thoroughly for control of brown rot. Fruit, large, deep purplish red, attractive; flesh, tender, somewhat fibrous, sprightly sub-acid, intermingled with sweet; quality is fair; season, August.

**TOKA, HANSKA AND KAGA**

These are much alike. They are hybrids of the American plum and the fragrant apricot plum in China. The fruits are much like the Chinese plum in shape, flesh and flavor. Of the three, Toka is the largest and has the record of being the hardiest. Hanska has suffered winter injury at Charles City. The fruit of Toka and Hanska are medium size, flattened at the apex, bright red, firm fleshed, small of pit, and of very good quality. Those who have grown Toka give it strong approval because of its very excellent size, quality, and hardiness. It is the best of these for Iowa planting.

**HANSEN SAND CHERRY HYBRIDS**

**Opata**

Bears very young, very productive; fruit about 1 inch in diameter; roundish; greenish blue color, with greenish col-

ored flesh, sweet, fair quality; ripens in central Iowa during the first two weeks of July. Tree is hardy, a stronger grower than Sapa.

Sapa

Follows Opata in season; tree hardy, dwarfish, and very productive, bearing fruit at two or three years of age. The fruit is about an inch in diameter; nearly black with purple flesh, tender, juicy, and good quality; good for canning purposes.

These sand cherry hybrids are particularly desirable in those locations where most other fruits are difficult to grow, but should always be planted with several varieties in a group to provide the necessary cross fertilization of the blossoms.

PART IV. CHERRIES FOR IOWA

For central and southern Iowa no varieties of cherries are better adapted to general culture for the home orchard and for local markets than the well known sour sorts, Early Richmond and Montmorency. The season may be lengthened by the addition of English Morello. Timme is also valuable, but differs but little in type and season from Early Richmond, it has shown evidence, however, of being a little more hardy and longer lived than Early Richmond. Timme is not generally well known, but it is offered by a few Iowa nurseries and is worthy of trial. As for the sweet varieties, they are, in general, not sufficiently hardy in tree nor fruit bud for Iowa. Several varieties are now listed by Iowa nurserymen which are worthy of trial in the home orchard in central and southern Iowa.

Schleihahn

This variety was imported by Prof. J. L. Budd of this institution about 1890. The tree was still growing upon the station grounds when described by Beach, who states that the tree is "half hardy" at Ames, but with "superior hardness for a sweet cherry." Schleihahn fruits oftener than the peaches, but not equal to the sour cherries in hardiness of fruit bud. The fruit is of good medium size, as grown at Ames, averaging three-fourths to an inch in diameter. The skin is glossy, bright deep red, becoming nearly black as it ripens. The flesh is dark red, very firm, moderately juicy, sweet, good. Season at Ames, June 20 to July 1, averaging about two weeks later than Early Richmond. Schleihahn was first disseminated by this station to nurserymen in August, 1911." Some good reports from it in southern Iowa indicate that it is worthy of trial in the home orchard.

Yellow Glass

Imported from Europe by Prof. J. L. Budd of Iowa State College in 1883, this cherry was propagated and disseminated to many parts of the state, and described by Little* in 1907. The tree is large with abundant foliage, fruit medium to above in size, roundish, heart-shaped, skin thin, light lemon yellow color, flesh firm, yellow, colorless juice, meaty, quality good; season about July first.

It is suggested to those who wish to plant sweet cherries that both of the above sweet varieties be planted to permit a possibility of cross fertilization of blossoms, which is often so necessary with many other sweet sorts if good sets of fruit are to be secured.