Varieties of Tree Fruits for Iowa Planting

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Varieties of Tree Fruits for Iowa Planting

Wealthy is the leading variety grown commercially in northern Iowa. View in an 80-acre orchard, Charles City, Iowa.

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

C. F. Curtiss, Director

POMOLOGY SECTION

Ames, Iowa
INDEX.

Soil, climatic factors, local experience and their importance in selecting varieties for Iowa ...................................... 5-6

Apples
Division of Iowa into general areas................................. 3
Topworking ....................................................................... 9
Standard varieties .......................................................... 9-19
Crab apples ..................................................................... 21
New apples originated and introduced by Iowa Agricultural Experiment Station ................................. 21-26

Pears
Varieties for Iowa ............................................................ 27-29
Patten—a new hardy pear introduced by the Iowa Agricultural Experiment Station ................................. 28

Plums
Native American varieties................................................. 29
Japanese and European varieties ...................................... 29
New Hybrid plums............................................................ 31
The Patten plum—Introduced by Iowa Agricultural Experiment Station .................................................. 28-29
Hansen’s hybrid plums....................................................... 31

Cherries
Sour varieties for Iowa..................................................... 31-52
Sweet varieties worthy of trial.......................................... 32
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

Southern Iowa (Area 1)
Arkansas (Mammoth Black Twig)
Ben Davis, Gano, Black Ben Davis
Delicious
Jonathan
Grimes
Northwestern Greening
Oldenburg (Duchess)
Willow
Winesap

Northern Iowa (Areas 2 and 3)
Brilliant
Malinda
Northwestern Greening
Oldenburg (Duchess)
Salome
Wealthy

See variety discussions.

VARIETIES FOR HOME ORCHARD PLANTING

Thirty or forty trees 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. Hawkeye Greening is the most productive of the new varieties originated at Ames. Uniformly large, an excellent sort for culinary purposes. Season December to March. Probably very desirable in area 3.
VARIETIES OF TREE FRUITS FOR IOWA PLANTING

PART I. APPLES

BY H. L. LANTZ

This circular is intended to assist orchardists in Iowa in the selection of tree fruit varieties which will be adapted to locality and suit the purpose of planting, whether it be 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 time and continued trial in any part of this country, most of them falling short in some vital character, which has 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 good enough in a number of respects to compare favorably with newer and better varieties.

Horticultural progress is linked closely with the origination and introduction of new and better varieties. However, the average amateur grower 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 quite fully proved its right 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, if best returns are to be secured. Particularly is this true of the commercial orchard, where success is so largely dependent upon choosing varieties which are regularly productive and which are 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. It is well to understand, also, peculiarities as to susceptibility to disease and insect injury, together with the characteristics of tree and fruit, in making a selection.
There is a vast difference among varieties as to 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 succeed not at all satisfactorily 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, there are a number of varieties which are available, many of 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 fall 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. Every one 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 be-

cause 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, Delicious, 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 vari-
Fig. 3. A test of hardiness in an Iowa orchard. Jonathan trees showing severe winter injury; Northwestern Greening trees at left, uninjured. "Test Winters" do much damage to half hardy varieties, particularly in central and northern Iowa.

ety 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 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 Mis-
sissippi 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 which are usually not grown in sufficient quantity to supply local demand.

SPECIAL PRACTICES IN RELATION TO HARDINESS MAY BE VALUABLE.

Horticultural experience in Iowa indicates quite clearly that certain practices may be employed to advantage in growing these half-hardy but highly desirable varieties, some distance north of where they are naturally adapted. The most commonly accepted practice is to topwork Jonathan, Delicious and Grimes and others of like hardiness, on hardy stock 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 Hibernal as stocks. Other hardy stock varieties may be used, but none have as much favorable horticultural experience back of them as do Virginia Crab and Hibernal.

Other special practices which are beneficial are the use of manure, either barnyard or green, with the idea of providing 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 minimized by providing either natural or artificial soil mulches before winter weather begins, such as can be secured by growing late in the summer, buckwheat, rye, weeds, or by adding straw or manure as top dressing.

DISCUSSION OF APPLE VARIETIES

The descriptions of the apple varieties listed herein are not technical descriptions but general, giving 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.
Fig. 4. Two notable apples have originated in Iowa. The original Dellclouo 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.
In writing the following descriptions and discussions, the most authoritative methods and 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. Take 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, best, with good as a center point. Ben Davis is commonly 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.

ANISIM.

Of Russian origin; disseminated during the 80's and for a time gained some favor because of its hardiness; besides it is productive and long-lived in any part of northern Iowa. Old trees present a wonderful example of real hardiness, but otherwise the variety is of little value. Comes in season between Oldenburg and Wealthy; ranks fair in quality, but is too small to be desirable either for home use or commercial purposes.

Fruit, of attractive, good, deep red color, overspread with a delicate lilac bloom; tender flesh, sprightly sub-acid flavor, but lacking in richness; quality, fair; season, mid-August; poor keeper.

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 over a long season, but should not be planted north of Des Moines.

Fruit usually of large size; largely overspread with a dull, deep red color on a dull green under color; 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. Altho Ben Davis
and its kin have been losing favor for the past two decades, Ben Davis has been one of the two leading commercial varieties for many years. 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.

Among 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 has rendered the tree susceptible to the attacks of blister canker. This disease has been particularly destructive in nearly every part of southern Iowa.

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 Ben 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 equal to it 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 very 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. Purchased by Stark Bros.' Orchards & Nurseries Co., Louisiana, Mo., in 1894, from the late Jesse Hiatt; disseminated in 1895 under the name of Delicious. Because of excellent quality, large size and attractive color, it was very soon accepted, both by customers 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 of opinion 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 flowering and satisfactory crops. Evidently Delicious requires for best development under Iowa conditions a cultural practice which conserves moisture and makes available a large amount of 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 extremely popular 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.

EASTMAN.

Originated by C. G. Patten, Charles City, Iowa, as a seedling of Fameuse. Not widely grown except in northern Iowa; has been sufficiently tested to indicate that, in several respects, it is not good enough to warrant extended plantings. Bears quite early, exceedingly productive. Collar rot often develops and soon kills a portion of the trees outright. As a commercial variety it grades out an excellent pack because of its good size. The trade is not well acquainted with the variety and does not take it readily unless the crop of other varieties is short.

Fruit, medium to large; resembles Wealthy in tone and type of color, but less attractive. Flesh, coarse, tender, juicy, mild sub-acid; fair quality, season September; goes down quickly; not equal to Wealthy for either the home orchard or for commercial purposes.
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 up to good market size, and then to harvest it successfully. Commercially 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, 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.

A new yellow apple of considerable promise. Yellow apples have been generally less successful than red varieties, and are therefore less popular. 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 recently introduced as such an apple. It originated as a chance seedling in West Virginia and is being disseminated by Stark Brothers, Louisiana, Mo.

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. The tree is well formed and a 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. Late season. Shows none of the common storage defects such as scald or internal breakdown. Worthy of planting in nearly every home orchard, particularly in southern Iowa, and deserving trial in commercial plantings.

GRIMES.

Most popular yellow apple in Iowa. Old, well known sort, of high quality for dessert and for culinary uses. Tree regularly productive and does well 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 over-production and winter injury. Losses from collar rot on Grimes can be eliminated by the use of hardy stock. Virginia Crab has 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. Subject to storage scald and internal breakdown which often causes 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 through 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 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.

Tree is productive and satisfactorily hardy and long lived for commercial planting in southern Iowa. Subject to winter injury if cultural method does not provide a soil mulch. Fire blight in all its forms is occasionally serious where high cultural conditions promote too succulent growth, but is quite 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.

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 medium size, smooth and symmetrical; bright deep red or carmine which extends 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; harder than Jonathan in tree.

At its best it is nearly if not 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.

Fruit, medium size; decidedly attractive, solid deep red or carmine extends over the entire surface. Averages in size with Jonathan and resembles Jonathan in form, but somewhat more inclined to 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. Tree, vigorous, healthy and long lived. Fruit of good
size, oblate, with a whitish skin overspread with an attractive pinkish red and mottling. 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. Slow to come into bearing and, in general, an uncertain cropper. 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 often drops 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 Gays 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.

MINKLER.

Found in many farm orchards thru southern and central Iowa; and in some instances quite liberally planted commercially; it is no longer recommended for commercial purposes in Iowa on account of its general lack of style and quality for market purposes. The tree is spreading and twiggy in habit.

Fruit, good average size, oblate; dull red, mottled and striped, over a greenish or yellowish green ground color. Flesh, rather tough, coarse, juicy, sub-acid, fair to good quality; season, November to April.

NORTHEASTERN GREENING.

Quite liberally planted thruout middle west and 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 thruout 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, 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.

Tree, hardy, 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 thoroly 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. When produced in car lots, there is generally a ready market in most years when well grown, graded and well packed. Southern Iowa Oldenburg are usually ready early in August. The season runs progressively later northward, and at Charles City, it is ready for market from August 20 to 25.

Oldenburg is difficult to handle commercially; 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 over-ripeness and to scald.

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. It is an open question whether Oldenburg should be planted in Iowa for some little time except for home use. Due to excessive plantings in other sections, consider carefully future market condition before planting more Oldenburg than can be disposed of locally.

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, fair to 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 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 quite 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 quite well adapted to the friable, warm and retentive soils of southern Iowa where rainfall is ample. 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. 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. In 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, medium size; striped and mottled with pinkish red or carmine color over most the surface; somewhat coarse, crisp, juicy, sprightly sub-acid, good or better in quality; season winter.

**SHERIFF.**

A regularly productive variety planted commercially to some extent in Iowa, but with no outstanding characteristics to commend it. Fruit, of medium size, smooth, regular and symmetrical; often lacking in attractiveness, but when well grown is a good lively red, striped and splashed with carmine over a yellow or yellowish-green underlying color. Flesh, moderately fine grained, tender, juicy, mild sub-acid, good; season winter; in cold storage February or March.

**STAYMAN.**

An important variety in some of the leading apple growing sections of the eastern 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. But with a judicious selection of soil and careful pruning, it offers possibilities for commercial culture in extreme southern Iowa. A tree or two for the home orchard collection would not be amiss.

Fruit, when well finished, medium to large; attractive the rather dull red with varying shades of 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 throughout 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, lacking essentially in 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 Wealthy.

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. The tree is harder under Iowa conditions, and far superior in every way to Yellow Newtown. 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.

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

Pretty generally known in the middle west for nearly fifty years; quite 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 middle west. 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 must 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 thoroughly 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 a valuable and popular sort for many years.

WOLF RIVER.

One of 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 usually 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, often 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 yellow 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; one of the best of its class for culinary purposes; hardy and productive; season, September, October, or later.

**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. 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 eleven apples, one plum, and one pear, have been named for distribution and trial. Scion wood of the selected seedlings has been distributed over 39 states, Canada, South America and England for trial. Nurserymen of Iowa and of other states have received scion wood of the most promising ones and within a few years it is hoped that those who wish trees of the new varieties may be able to secure them.

It should be distinctly understood that the new apples are not recommended except for trial plantings. They have been fruited only at Ames and with observations thus limited, sufficient information has not accumulated to warrant any extravagant claims for them. Of these new apples, five, particularly *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.

There is great need for hardy, red, winter apples in central and northern Iowa and one of the purposes of the station is to breed fruit adapted to that section of the state. As other new sorts are originated, the most promising ones will be made available.

It has been the policy of the station to distribute scion wood, first of all, to those nurserymen of the state who wish to propagate them for trial or for sale. The new named apples are disseminated by the station without restrictions as to propagation and sale.

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 named apples which are being introduced:
AMES. (Allen Choice x Perry Russet)

A regular bearer since coming into fruiting in 1920. The fruit is of good quality and keeps till 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.

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, juicy, 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 advantage of Jonathan in being later in season by six weeks or two months, keeping well in cold storage till March or April, and has shown none of the common storage defects of Jonathan. The tree is moderately vigorous and healthy, and favors Jonathan in habit. The fruit is well distributed over the tree and hangs well until fully matured.

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

Fig. 5. Ames is worthy of further trial. It is a late winter apple of fair size, fine red color and of good quality.
Fig. 6. Edgewood (Saleme x Jonathan) is a red winter apple of very good quality, and appears to be worthy of extended trial wherever Jonathan does well.
Fig. 7. Secor (Salome x Jonathan) is an Ames seedling of promise. It is a red late winter apple of very good quality.

sub-acid, rather rich, favoring Jonathan in flesh very markedly; quality, very good; season, January to April.

Edgewood appears to be of value for trial throughout the Jonathan belt and northward.

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.

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.

HAWKEYE GREENING. (Vermont Seedling Unguarded)

The original Hawkeye Greening tree is of upright and 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. It is of the Rhode Island Greening type, but is a little less symmetrical in form, but clearer in tone of color.

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.
Fig. 8. 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 x Longfield.

SHARON. (McIntosh x Longfield)

A bright, clear-skinned, attractively striped apple, with pleasing, rather rich, aromatic, mild sub-acid flavor, of very good dessert quality. The original tree appears to be hardy, has excellent foliage and is productive in alternate years. As a nursery tree, Sharon ranks well in vigor with the standard varieties as grown at Shenandoah, Iowa. The fruit matures on the tree about the middle of September as grown at Ames. It is of good, uniform size, form and color, and keeps in cold storage until February or 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 mottled over most of the surface with contrasting yellow color showing thru toward the apex. Skin, rather thin and tender, takes a high 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.

The original tree appears to be hardy, ripens its fruit early enough to suggest that it is worthy of extended testing throughout central and northern Iowa as a winter apple. None of the winter sorts now grown in this section are equal to it in quality and appearance.

MACY. (Northwestern Greening x Wealthy)

When well grown, Macy resembles Northwestern Greening in size and in form quite closely, but resembles Wealthy in tone and type of color. The original tree is very vigorous, spreading in habit with large, healthy, green foliage, very productive. The fruit favors Wealthy in texture, grain, and flavor, but matures normally on the tree about two weeks later than Wealthy and is in season from October to January, if placed in cold storage.

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 appears to be worthy of trial as an apple to supplement Wealthy in season. If the tree proves to be hardy, it should be valuable for central and northern Iowa.
AFTON. (Wolf River x Harrington)

This is a red winter apple, which, if hardy, may be valuable in northern Iowa. In cold storage, keeps until March.

Fruit, medium to above medium in size. Form, roundish conic, regular and symmetrical. Color, greenish, largely self-colored with a bright deep tone of solid red. Skin, thick, moderately tough. Flesh, tender, fine grained, juicy, sprightly sub-acid; quality good.

MONONA. (Wolf River x Harrington)

An attractive red apple, uniformly large, ranking very good in quality for dessert or for culinary purposes.

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, largely self-colored, 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. This variety may be termed as a novelty because of its peculiar perfume, and is recommended only for limited trial for those who like to experiment with novelties.

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 trying for a red summer apple.

ADEL. (Unknown Parentage)

Originally grown as a seedling for stock from mixed seed of winter apples. A late fall and early winter apple of the Gravenstein type, favoring that variety in color and in flavor. The tree is among the most hardy of the seedlings which have been developed by this station. It is productive and healthy, but the fruit sometimes drops quite freely as it matures.

Fruit, medium to above medium in size. Form, oblate, obscurely ribbed, slightly inclined to conic. Skin, thick, tender; color, clear pale yellow to yellow, striped and mottled with a lively red. Flesh, fine grained, very tender, juicy, sprightly sub-acid. Quality, good to very good. Season, October to January.

Not recommended except for northern planting.

EARLHAM. (Colorado Orange x Allen Choice)

Earlham is a large, clear skinned, yellow apple with a pinkish blush. A late keeper of good quality, but since being named, it has shown some serious defects on the tree and in storage, and will be held under observation for a few years more, until further information is available before it is further disseminated.
PART II. PEAR S FOR IOWA.

Generally speaking, no pear variety of good standard quality has proved satisfactorily hardy and productive in Iowa. Pear blight has made pear-growing a precarious proposition at the best, so that today pear orchards are seldom found 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, so as 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, quite hardy, and relatively free of blight, but not always a good cropper. Should only be planted in southern Iowa.

FLEMISH BEAUTY.
Quite hardy in tree, productive, but very susceptible to scab and 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

Fig. 9. The Patten pear is of good size, productive and very good in quality. It is worthy of a trial in all parts of Iowa.
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 quite 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; roundish; 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. Topworked on hardy pear stock, it is showing evidence of being 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.

**PATTEN.** (Orel 15 x Anjou)
Originated by C. G. Patten, Charles City, Iowa. Sent out for trial by the Iowa Agricultural Experiment Station in 1919, as "Patten 1206". Named and introduced in 1922 under the name of Patten, by the station. The original tree, which is still growing at the State Fruit Breeding Farm, Charles City, has been moderately productive. Grafted trees have been even more productive. Under natural conditions, none of
the trees of the Patten have blighted at Charles City. Just what resistance it will show in other localities is only a matter of conjecture.

The tree is distinctly upright in habit, with large, healthy foliage. Blooms a little past mid-season. The blossoms are large handsome white, with a double corolla (10 petals) instead of the usual single corolla.

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 quite 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 granular if permitted to hang on tree too long; season, September.

PART III. PLUMS FOR IOWA.

Under the rigorous climatic conditions of Iowa, the varieties of plums most generally accepted as successful belong mainly to the native American species, *Prunus americana*. In general, the Japanese type of plums, *Prunus triflora*, and the European sweet plum, *Prunus domestica*, are seldom grown with much success because of a general lack of hardiness. A few varieties of the native plum of the south, *Prunus hortulana*, are satisfactorily hardy and productive. In recent years a number of promising new hybrid plums have been originated and introduced, some of which are of undoubted value for Iowa.

The native American plum varieties, *P. americana*, thrive on a wide range of soil types, so long as drainage is reasonably good. Many varieties of this group are satisfactorily hardy and productive in any part of the state. In general, they are somewhat less subject to brown rot fungus than the Japanese varieties, but require spraying for the control of brown rot and of curculio.

The Japanese varieties are only moderately hardy in southern Iowa or in south central Iowa. They do well only on well drained, friable soils. The blooming period is comparatively early, making them liable to frost injury.

Only a few European sweet plums are at all satisfactory in Iowa, chief of which is Lombard, a large blue plum of only fair quality. Occasionally Green Gage is found doing well, but none of the Europeans can be depended upon except on well drained, rich soils in southern Iowa, and perhaps in central Iowa where sites are carefully selected.

The hybrid plums, many of which have equal mixtures of American and Japanese blood, often partake of the hardiness of the American plum, but some of them bloom early and rot badly, similar to the Japanese parent. These new plums are in general harder and can be grown further north than can any of the pure Japanese varieties.

The selection of varieties is largely a local problem and should not only be based upon local soil and climatic conditions, but also with respect as to whether the planting is made to supply home or market demand. The consumer in general demands large fruited varieties. Nearly all plum varieties are highly self-sterile, making it necessary to plant several varieties together, at least four to six, to insure satisfactory cross-fertilization at blossom time.

The following list of plum varieties is suggestive for Iowa planting. Only brief notes are given as nearly all varieties mentioned vary greatly in size and quality as grown under the wide range of soil types, and under the varying systems of culture.
Abundance. *Triflora* Hardy only in southern Iowa. Ripens unevenly, tends to run to small sizes if not thinned. Color, pinkish red; flesh, yellow, melting and sweet; cling stone; quality good. Fruit susceptible to brown rot.

Burnbank. *Triflora* No harder 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.

Burwood. *Triflora x Americana* A hardy, productive hybrid plum; tree and foliage are of the Japanese type; fruit of medium large size; roundish; reddish; with tender, fine grained, juicy, rich, sweet flesh, good quality; season, early September. One of the best of the older Japanese hybrids, but rots badly unless properly sprayed.

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

Forest Garden. *Americana* Ranks among the best of the early varieties for planting in Upper Mississippi Valley. The tree is moderately vigorous; and is productive. The fruit is medium to above in size; overlaid with attractive bright red; covered with bloom; flesh, yellow, rather firm, tender, juicy, sweet, good quality.

Hawkeye. *Americana* A hardy, large fruited plum, and regarded as one of the standard varieties of the American species. Color, yellow, more or less covered with red dots; flesh, yellow, Juicy, sweet, good. Mid-season. One of the best of the species.

Miner. *Hortulana* An old standard variety; hardy; moderately productive; fruit bright red; roundish; firm, juicy, good quality; late season.

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

Rockford. *Americana* Introduced by C. G. Patten, and still offered by some nurserymen. Fruit medium size; dark purplish red; flesh meaty, juicy, sweet flavored, and very good quality.

Stoddard. *Americana* Similar in appearance to Hawkeye. One of the high standard varieties of this species; large, attractive, light to dark red, good quality. September.

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.

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.

Wolf. *Americana* Hardy and productive; fruit large; roundish ovate; deep red over yellow with bluish bloom; flesh, firm, somewhat fibrous, tender, juicy, sweet, freestone, good quality; one of the best of the native plum varieties.

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

Patten Plum. *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 sea-
son, five to seven days later than most of the pure American varieties
and thus escapes an occasional late frost.

The fruit is large to very large; roundish; somewhat flattened at the
ends; suture line indistinct; color, medium red, with lilac bloom, 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.

THE HANSEN HYBRID PLUMS.

The Hansen Hybrids, originated by Dr. N. E. Hansen, of the South
Dakota Experiment Station, are perhaps the most popular plums
grown in the Upper Mississippi Valley and have gained favor in Iowa
because they are so productive, bearing well at a few years of age in the
orchard.

Opata. Bears very young; very productive; fruit about one inch in
diameter; roundish; greenish-blue color, with greenish-colored flesh,
sweet, fair quality; ripens in central Iowa during the first two weeks
of July; tree hardy, dwarfish.

Sapa. Follows Opata in season; tree hardy, dwarfish; fruit black,
with very dark flesh; recommended for canning. Opata and Sapa will
be desirable for those who have had difficulty in growing other and
large fruited types of plums.

Waneta. The largest fruited of the Hansen Hybrids. Tree bears
young and abundantly, and often needs thinning to prevent breakage
of limbs and to bring the fruit up to large desirable size. A widely
planted plum in the north and becoming more popular in Iowa each
year. Must be sprayed thoroly for control of brown rot. Fruit
large to very large; deep red with bluish bloom; attractive; flesh ten-
der, somewhat fibrous, sprightly sub-acid, intermingled with sweet.
Quality, good; season, August.

Hanska. Less popular than Waneta, but worthy of trial; tree
larger and more vigorous than Waneta; fruit quite large, and of good
quality for dessert or for culinary purposes.

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; however, it has shown evidence of being a little
more hardy and longer lived than Early Richmond. Timme is not
generally well known, but is offered by a few Iowa nurserymen and is
worthy of trial. As for the sweet varieties, they are, in general, not
sufficiently hardy in tree or fruit bud for Iowa. There are several varieties 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 hardiness 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 of 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.