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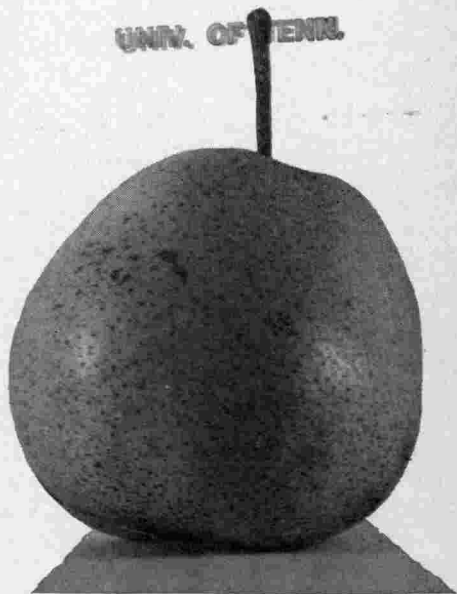
Morgan and Carrick-- Two Blight-Resistant Pears

by
Brooks D. Drain
and
Lawson M. Safley

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This is a fruit of the Morgan pear. Specimens from young trees usually lack finish, but the flesh is of good quality.

**The University of Tennessee
Agricultural Experiment Station
John A. Ewing, Director
Knoxville**

SUMMARY

- Two new pear varieties—the Morgan and the Carrick—have been developed by the University of Tennessee Agricultural Experiment Station. Both varieties ripen in September. Both are relatively blight-resistant in Tennessee.
- The Morgan pear blossoms very late and the Carrick pear blossoms medium-early.
- The Morgan pear—a Bartlett-Late Faulkner cross—grows upright; produces good annual crops under favorable conditions; grows yellow fruit, medium to large in size that has a rose blush and a subacid flesh, and that is melting in texture and good in quality.
- The Carrick pear—a Seckel-Garber cross—is spreading in growth; produces good annual crops; grows medium-sized, solid russet fruit of high quality when it is mellow-ripe.

ACKNOWLEDGMENT

Before 1931, records were kept by J. A. McClintock and H. L. Facker. The following persons assisted with this project: E. M. Henry, 1932-35; Arthur Meyer, 1938-39; D. M. Bailey, 1940-41; Joan Wiley, 1944-46; and Earl Ogle, 1947-49, at Knoxville; P. L. Hawthorne, 1947, and W. E. Roever, 1948, at the West Tennessee Agricultural Experiment Station; Dennis Latham, 1939-51, and Lawson M. Safley, 1952, at the Highland Rim Experiment Station.

Morgan and Carrick — Two Blight-Resistant Pears

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Two New Pears Ripen in September

Four Chinese Sand pear hybrid varieties were named and introduced by the Tennessee Agricultural Experiment Station in 1954. These varieties had proved highly resistant to fire blight over a long period and were recommended to fruit growers for trial. None of these varieties ripened in September. This publication describes two September ripening varieties that have proved highly blight resistant in the Tennessee trials and were developed from between 30,000 to 40,000 progenies.

Table 1. — *Pear Blossoming Dates, 1957, at Knoxville Orchard*

Variety	Date of First Bloom	Date of Last Bloom
Mooers	March 31	April 4
Morgan	April 1	April 5
Kieffer	March 16	March 28

Blossoming of pears extends over a considerable period of time under southern conditions. Tables 1 and 2 contain blossoming data for two common varieties as well as for the two new varieties described later in this publication. Note that Morgan blossoms very late and Carrick medium-early. Late-blooming varieties may escape spring cold injury in some seasons. Varieties to cross-pollinate each other should blossom at approximately the same time and must have viable pollen.

Several methods of measuring fire blight resistance were described in Station Bulletin No. 236. One of the most efficient methods used in the Tennessee work is the following: A selection to be tested for resistance is grafted on the usual pear stock. At 1 or 2 years of age a susceptible variety such as Clapp or Bartlett is top-worked into the top. The following spring fire blight is inoculated into the susceptible branch. (See Figure 1.) The disease usually develops rapidly in the

susceptible variety. If the selection is of high resistance, blight will stop at the graft or bud union.

Many inoculations¹ were made into the first new growth in the spring in trees—mostly nursery trees—of varying ages. A syringe and culture of fire blight were used in this work. All varieties and species of pears developed fire blight. This susceptible period was very short in Orient and extended over considerable time in Bartlett. This observation leads to the theory that fire blight resistance is developed in or transferred to new growth in the spring, which may help explain variations in the development of this disease.

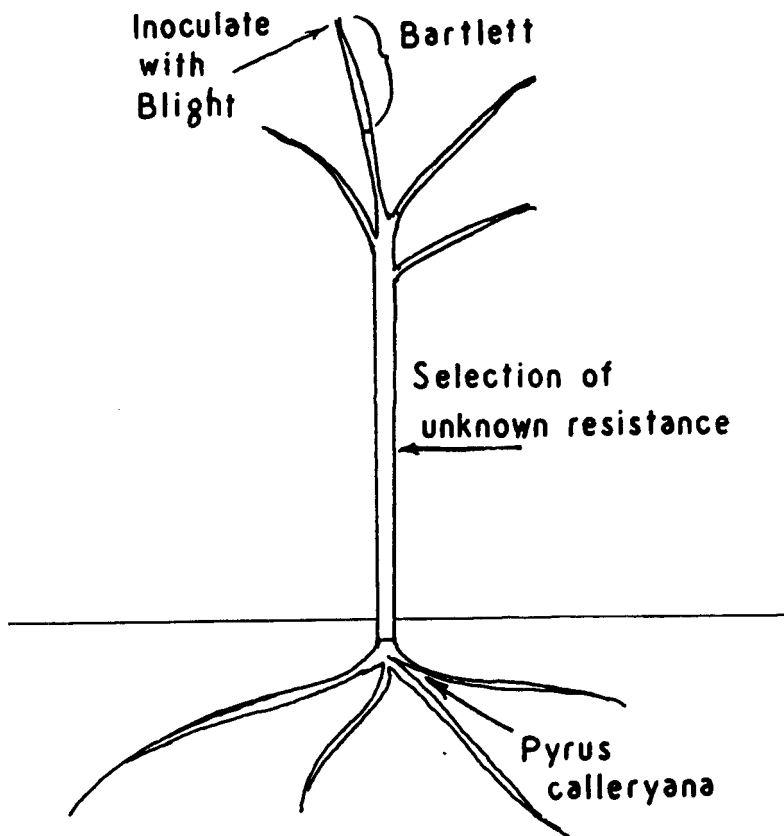


Figure 1—This diagram shows a plan designed to measure fire blight resistance in a pear selection. Blight develops rapidly in the Bartlett graft but will stop at the graft union in highly resistant varieties and selections.

¹Cultures prepared by the Department of Plant Pathology.

The Morgan Pear

This pear was obtained by crossing Bartlett ♀ with Late Faulkner ♂, and is one of the few progenies of Bartlett that have developed very little blight to date. Since immunity rarely if ever occurs, we must expect a few blighted twigs even in highly resistant varieties. It is named Morgan pear in honor of Harcourt A. Morgan,² a past president of the University of Tennessee.

Morgan pear trees are upright in habits of growth, are good growers (see Table 3), and under favorable conditions produce good annual crops. The flesh is subacid, melting in texture and good in quality. This yellow pear often has a rose blush and is medium to large in size (see front cover).

Two growers have fruited this variety in Tennessee and 12 neighboring stations³ have trial plantings.

Table 2 — *Pear Blossoming Dates, 1957, at Knob Orchard, Blount Co.*

Variety	Date of First Bloom	Date of Last Bloom
Dabney	March 20	April 2
Carrick	March 14	March 26
Baldwin	Feb. 12	Feb. 28

Technical Description of the Morgan Pear

Tree: Large, vigorous, upright; top compact becoming more spreading with loads of fruit; trunk stocky, gray becoming dark gray on older trees; branches medium slender, gray-brown in color; branchlets slender, brown with large raised lenticels.

Leaf buds are medium in length and pointed; leaf scars obscure. Leaves: Petiole $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long, slender, color green tinged pink, surface slightly pubescent; blade $2\frac{7}{8}$ by $1\frac{1}{2}$ inches wide, folded; mid-rib reflex; sides even or slightly waved, outline oblong; base narrow,

²Dr. Harcourt A. Morgan was President of the University of Tennessee from 1919 until 1933, when he resigned to become one of the first three directors of the Tennessee Valley Authority. Before becoming President he was Dean of the College of Agriculture.

³Blacksburg, Virginia; Ardmore, Oklahoma; Urbana, Illinois; U.S.D.A., Meridian, Mississippi; Kentville, Nova Scotia; New Brunswick, New Jersey; State College, Mississippi; Lexington, Kentucky; Geneva, New York; Baton Rouge, Louisiana; Raleigh, North Carolina; and Bedford, Indiana.

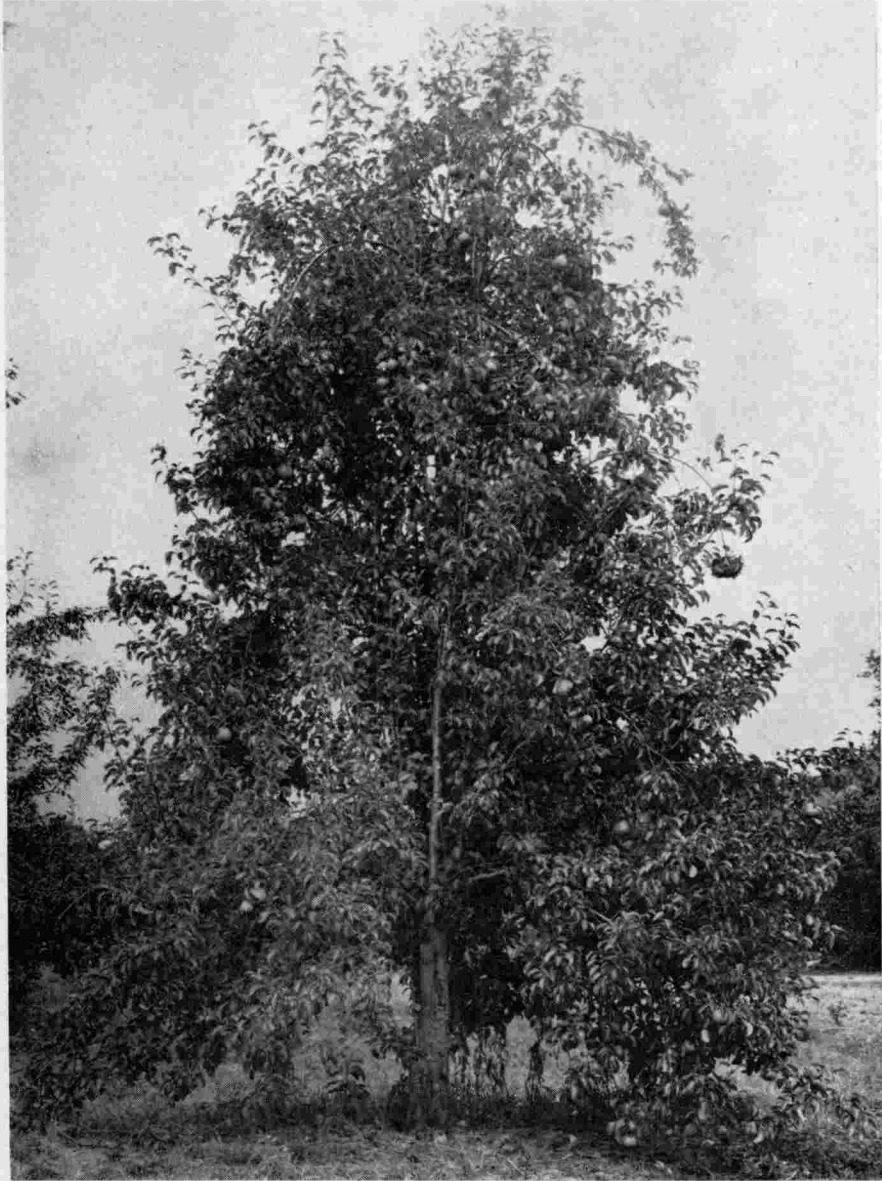


Figure 2—The mother tree of the Morgan pear was destroyed in building operations at Knoxville. This 9-year old tree is growing at the West Tennessee Experiment Station, Jackson, Tennessee and has produced many crops. Note its upright habit of growth.

Table 3 — *Growth Measurements of Pears, Jackson, Tennessee Planted in 1947*

Variety	Increase in Circumference					
	One season average			Two seasons averaged		5 year average
	51-52 in inches	52-53 in inches	53-54 in inches	54-55 in inches	55-56 in inches	in inches
Morgan	2-109/144	2-123/144	4-7/48	1-251/288	1-251/288	2-7/10
Kieffer	2-5/12	2-61/72	1-57/144	1-29/36	1-29/36	2-31/144
Ayres	1-77/144	2-137/144	1-91/144	2-53/72	2-53/72	2-229/720

apex narrow, point long and acute; general color light green, vein color green; position spreading to drooping; serrations dentate, direction forward, size medium, regular, surface shiny, texture fine, pubescence short, fine and wooly.

Flower buds medium in size, plump, brown in color and pointed; flowers opening late, a few blossoms by 3-24-53 at Knoxville, Tennessee; size medium to large, 1 inch to $1\frac{3}{8}$ inches; color white, unopen petals pink, stigmas dark pink or rose. Clusters medium compact, 6 to 8 blossoms and umbel-like in form; pedicel long, medium-thick, $\frac{7}{8}$ to $1\frac{1}{2}$ inches long, thickly pubescent; pollen fertile; distribution reasonably good.

Fruit: Picked latter part of August at Knoxville and Jackson, Tennessee; size medium to large 3 by $2\frac{3}{4}$ inches wide—roundish oblong slightly pyriform; stem 1 to $1\frac{1}{2}$ inches long, medium in thickness; cavity acute, deep, broad, and russeted; calyx open, and large in size; lobes usually separated at the base, medium long, broad and obtuse; basin deep, wide, abrupt and furrowed; skin thick, tough, often russeted and dull; color light yellow overlaid with russet and a rose blush; dots many, large, russet in color and conspicuous; core large— $1\frac{1}{2}$ by $1\frac{1}{4}$ inches—closed, axile, corelines clasping; calyx tube long, medium-wide and funnel shaped; carpels ovate; seeds medium in size, width and length, plump; flesh white tinged yellow, melting, tender and moderately juicy; flavor sweet-subacid, sprightly and good.

A Description of the Carrick Pear

The Carrick pear was named in honor of Samuel Carrick⁴, an early President of the University of Tennessee. It was secured by crossing Seckel ♀ with Garber ♂ in 1934. The original tree was planted in an

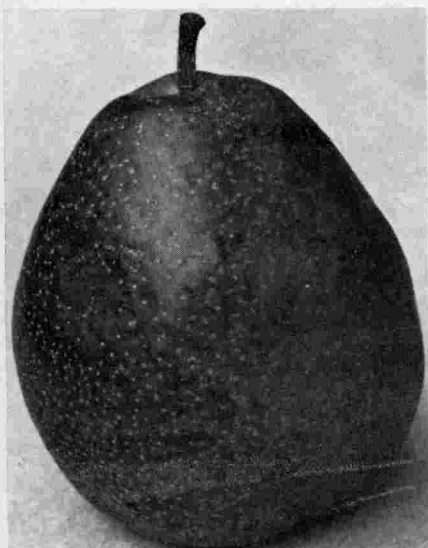


Figure 3—The rusty red color of this Carrick pear fruit photographs dark and does not indicate its attractiveness.

unfavorable location and early notes were limited. This medium-sized, solid russet pear attracted attention because of the quality of the fruit when mellow ripe. Immature fruits lack quality. The trees were free from defoliation, pear scab and for many years free from fire blight. A small amount of blight developed in later plantings. It first produced fruit in 1942 and has a good production record. Replicated yield plots were planted at the Highland Rim Station and at Knoxville. Twenty stations⁵ in Eastern United States and Canada have trial plantings, and it is suggested that those living near these stations visit or get in touch with them regarding local adaptation. Some of these trials were started recently.

The Carrick Pear—Its Technical Description

Tree: Large, vigorous, spreading; top moderately open; trunk medium thick, gray; branches medium slender, brown-gray; branchlets slender and brown; lenticels many and raised.

Leaf-buds small, short and pointed; leaf scars obscure. *Leaves:* Petiole $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long, thick, color pinkish green, surface glabrous; blade 3 to $3\frac{1}{4}$ inches long by 2 to $2\frac{1}{4}$ inches wide, folded;

⁴The Reverend Samuel Carrick was the first President of what is now the University of Tennessee. He was President of Blount College and East Tennessee College from the founding of the institution in 1794 until his death in 1809.

⁵Kentville, Nova Scotia; U.S.D.A., Beltsville, Maryland; U.S.D.A., Meridian, Mississippi; Lexington, Kentucky; Baton Rouge, Louisiana; Tifton, Georgia; Storrs, Connecticut; Urbana, Illinois; New Brunswick, New Jersey; Blacksburg, Virginia; Clemson, South Carolina; State College, Mississippi; Gainesville, Florida; Ardmore, Oklahoma; Bedford, Indiana; Raleigh, North Carolina; Newton, Mississippi; Griffin, Georgia; Charleston, South Carolina; and Princeton, Kentucky.

mid-rib straight to slightly reflex; sides even or nearly so, outline oblong; base broad, apex narrow, point medium-sized and moderately acute; general color dark green, vein color green; position spreading, serrations serrate, direction forward, size medium, regular; surface shiny, texture medium, pubescence short, fine and wooly.

Flower buds large, nearly spherical, plump and pointed; flowers open medium early, nearly full bloom at Knob Orchard, Blount County, Tennessee, March 18, 1953. Flowers medium in size, $1\frac{1}{4}$ inches across; color white with maroon colored stigmas; blossoms appear with the



Figure 4—A 9-year old tree of the Carrick pear. It has produced a number of crops. Note the spreading habits of growth.

leaves; clusters 8 to 10 blossoms and umbel-like form; pedicel about $\frac{5}{8}$ inch long, slender and sparingly pubescent; distribution reasonably good; pollen fertile.

Fruit: Picked in late August at Knoxville and Springfield, Tennessee. Ripens in September; medium to large—3 by $2\frac{3}{4}$ inches wide—oblong pyriform in shape; stem from $\frac{1}{2}$ to 1 inch long and thick; cavity acute, shallow, narrow and russeted, often lipped; calyx open

and large; lobes separated at the base, long and broad; basin medium to deep, wide, abrupt and furrowed; skin medium in thickness, tender and very russetted; color yellow overlaid with russet and a rose blush; dots many, russetted and moderately conspicuous; core small— $\frac{7}{8}$ by $1\frac{1}{4}$ inches long—open; core lines clasping; calyx tube long, wide and urn shape; carpels oblong obovate; seeds medium sized $\frac{3}{16}$ by $\frac{5}{16}$ inches long—medium wide, long and plump; flesh white tinged yellow, firm, crisp, tender and juicy; flavor sweet-subacid, sprightly and good.

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