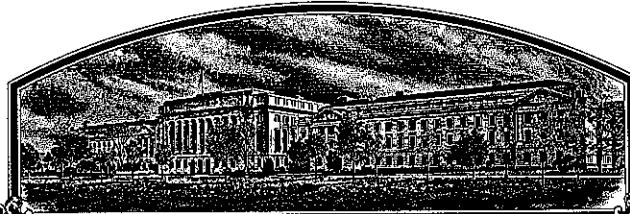


No.

9100049



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

North Carolina Agricultural Research Service

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICALLY REPRODUCED PLANT, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

TOMATO

'NC 84173'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 31st day of January in the year of our Lord one thousand nine hundred and ninety-two.

Attest:

Kenneth A. ...
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Edward Madigan
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) N.C. Agricultural Research Service Dr. R. G. Gardner (Breeder)		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. 84173(X)-3-1C	3. VARIETY NAME NC 84173
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) N.C. State University Box 7643 Raleigh NC 27695-7643		5. PHONE (include area code) 919-737-2717 704-684-3562 (Breeder)	FOR OFFICIAL USE ONLY PVPO NUMBER 9100049
6. GENUS AND SPECIES NAME Lycopersicon esculentum		7. FAMILY NAME (Botanical) Solanaceae	
8. CROP KIND NAME (Common Name) Tomato	9. DATE OF DETERMINATION March 21, 1990		F I L I N G Date Dec. 17, 1990 Time <input checked="" type="checkbox"/> A.M. <input type="checkbox"/> P.M.
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) State Governmental Agency		11. IF INCORPORATED, GIVE STATE OF INCORPORATION	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Michael W. Baker, Manager NC Foundation Seed Producers, Inc. P.O. Box 33245, Method Station Raleigh NC 27635		12. DATE OF INCORPORATION	

PHONE (include area code): 919-737-2821

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

- a. Exhibit A, Origin and Breeding History of the Variety.
- b. Exhibit B, Novelty Statement.
- c. Exhibit C, Objective Description of Variety.
- d. Exhibit D, Additional Description of Variety.
- e. Exhibit E, Statement of the Basis of Applicant's Ownership.
- f. Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office _____
- g. Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)

YES (If "YES," answer items 16 and 17 below) NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

YES NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

FOUNDATION REGISTERED CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

YES (If "YES," through Plant Variety Protection Act Patent Act. Give date: _____)

NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

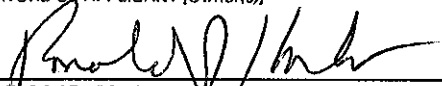
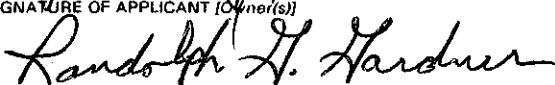
YES (If "YES," give names of countries and dates)

NO

20. The applicant(s) declares that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

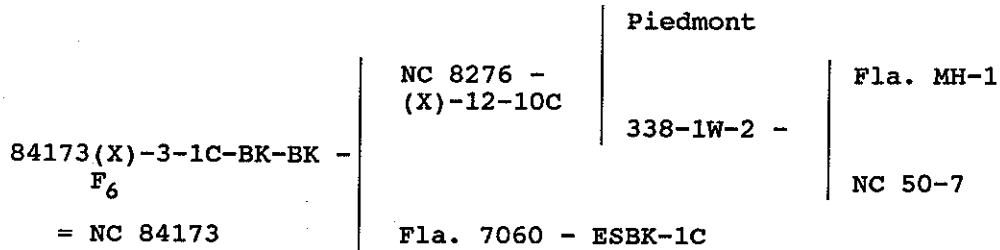
The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT (Owner(s)) 	CAPACITY OR TITLE Director, NC Agri. Res. Svc.	DATE 11/14/90
SIGNATURE OF APPLICANT (Owner(s)) 	CAPACITY OR TITLE Assoc. Prof. of Horticulture (Plant Breeder)	DATE Nov. 13, 1990

14A. Exhibit A:

Pedigree:



NC 84173, an inbred line in the F₆ generation, was developed using the pedigree breeding method. Its pedigree includes two previous releases from the North Carolina tomato breeding program, 'Piedmont' and NC 50-7, and two releases from the University of Florida breeding program, 'Fla. MH1' and Fla. 7060.

Single plant selections were made in the F₂ through F₃ generations from the cross of 8276(X)-12-10C X Fla. 7060 -ESBK-1C in field plots at Fletcher, North Carolina. Bulk selections were made in the F₄ and F₅ generations. Seedling inoculation tests in the greenhouse showed the F₄ and F₅ generations to be homozygous resistant (Ve gene) to race 1 of Verticillium dahliae. The F₆ generation was determined homozygous resistant (I and I-2 genes) to races 1 and 2 of Fusarium oxysporum f. sp. lycopersici in greenhouse seedling inoculation tests.

NC 84173 appeared uniform and stable in the F₄ through F₆ generations in research station plots. No off-types were observed.

9100049

Exhibit B. Novelty Statement

NC 84173 is most similar to the University of Florida breeding line Fla. 7060. It differs from Fla. 7060 in having the n gene, derived from NC 8276, for nipple tip (pinpoint blossom scar) at the stylar end of the fruit. It has in association with the n gene, adaxial leaf curl, which is not present in Fla. 7060.

U.S. DEPARTMENT OF AGRICULTURE
 AGRICULTURAL MARKETING SERVICE
 LIVESTOCK, MEAT, GRAIN AND SEED DIVISION
 PLANT VARIETY PROTECTION OFFICE
 BELTSVILLE, MARYLAND 20705

EXHIBIT C
 (Tomato)

OBJECTIVE DESCRIPTION OF VARIETY
 TOMATO (*Lycopersicon esculentum* Mill.)

NAME OF APPLICANT(S) NC Agricultural Research Service Dr. R. G. Gardner (Breeder)	TEMPORARY DESIGNATION 84173(X)-3-1C-BK	VARIETY NAME NC 84173
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) NC State University Box 7643 Raleigh NC 27695-7643	FOR OFFICIAL USE ONLY	
	PVPO NUMBER 9100049	

Choose responses for the following characters which best fit your variety. Complete this form as fully as possible for best characterization of the variety. When a single quantitative value is requested (e.g., fruit weight), your answer should be the mean of an adequate-sized, unbiased sample of plants. Use leading zeroes when necessary (e.g., 0 9 or 0 8 1, etc.). The applicant variety should be compared with at least one well-known standard check variety of the same type (see list of recommended check varieties below), and grown in the same trials. The characters on this form should be described from plants grown under normal conditions of culture for the variety. Indicate by a check whether trial data are from greenhouse _____ or field _____ plantings. Trials direct-seeded _____ or transplanted _____; staked _____ or unstaked _____. Give locations and dates of seeding and transplanting here: _____
 Fletcher, North Carolina; seeding dates: 4/14/87, 4/15/88, 4/17/89, 4/16/90
 Transplant dates: 5/22/87, 5/30/88, 5/31/89, 5/25/90

COMPARISONS SHOULD BE MADE TO ONE OR MORE CHECK VARIETIES IN THE FOLLOWING LIST, IF AT ALL POSSIBLE. ENTER THE NUMBER OF THE CHECK IN BOXES WHERE IDENTITY OF CHECK IS REQUESTED.

- | | | | |
|------------------|-----------------------|---------------|----------------------------|
| 1 = Ace 55 VF | 7 = Homestead 24 | 13 = Red Rock | 19 = VF 134 |
| 2 = Campbell 37 | 8 = Marglobe | 14 = Roma VF | 20 = US 28 |
| 3 = Chico III | 9 = Murietta | 15 = Rutgers | 21 = VF 145 B 7879 |
| 4 = Flora Dade | 10 = New Yorker | 16 = Sunray | 22 = Other (Specify) _____ |
| 5 = Florida MH-1 | 11 = Ohio MR-13 | 17 = Tropic | |
| 6 = Heinz 1350 | 12 = Red Cherry Large | 18 = UC 82 | |

1. SEEDLING:

Anthocyanin in hypocotyl of 2-15 cm. seedling: 1 = Absent 2 = Present Habit of 3-4 week old seedling: 1 = Normal 2 = Compact

2. MATURE PLANT (at maximum vegetative development):

Cm. Height

Growth: 1 = Indeterminate 2 = Determinate

Form: 1 = Lax, open 2 = Normal 3 = Compact 4 = Dwarf 5 = Brachytic

Size of canopy (compared to others of similar type): 1 = Small 2 = Medium 3 = Large

Habit: 1 = Sprawling (decumbent) 2 = Semi-erect 3 = Erect ('Dwarf Champion')

3. STEM:

Branching: 1 = Sparse ('Brehm's Solid Red', 'Fireball') 2 = Intermediate ('Westover') 3 = Profuse ('UC 82')

Branching at cotyledonary or first leafy node: 1 = Present 2 = Absent

No. of nodes below the first inflorescence: 1 = 1-4 2 = 4-7 3 = 7-10 4 = 10 or more

No. of nodes between early (1st - 2nd, 2nd - 3rd) inflorescences. No. of nodes between later-developing inflorescences.

Pubescence on younger stems: 1 = Smooth (no long hairs) 2 = Sparsely hairy (scattered long hairs) 3 = Moderately hairy 4 = Densely hairy or woolly

4. LEAF (mature leaf beneath the 3rd inflorescence):

Type: 1 = Tomato 2 = Potato ('Trip-L-Crop') Morphology (choose illustration on pg. 5 of this form that is most similar)

Margins of major leaflets: 1 = Nearly entire 2 = Shallowly toothed or scalloped 3 = Deeply toothed or cut, esp. towards base

Marginal rolling or wiltiness: 1 = Absent 2 = Slight 3 = Moderate 4 = Strong

Onset of leaflet rolling: 1 = Early-season 2 = Mid-season 3 = Late season

4

4. LEAF (mature leaf beneath the 3rd inflorescence -- continued):

- 1 Surface of major leaflets: 1 = Smooth 2 = Rugose (bumpy or veiny)
 2 Pubescence: 1 = Smooth (no long hairs) 2 = Normal 3 = Hirsute 4 = Woolly

5. INFLORESCENCE (make observations on 3rd inflorescence):

- 1 Type: 1 = Simple 2 = Forked (2 major axes) 3 = Compound (much branched)
 0 5 Number of flowers in inflorescence, average
 1 Leafy or "running" inflorescences: 1 = Absent 2 = Occasional 3 = Frequent

6. FLOWER:

- 1 Calyx: 1 = Normal, lobes awl-shaped 2 = Macrocalyx, lobes large, leaflike 3 = Fleshy
 1 Calyx-lobes: 1 = Shorter than corolla 2 = Approx. equalling corolla 3 = Distinctly longer than corolla
 1 Corolla color: 1 = Yellow 2 = Old gold 3 = White or tan
 2 Style pubescence: 1 = Absent 2 = Sparse 3 = Dense
 1 Anthers: 1 = All fused into tube 2 = Separating into 2 or more groups at anthesis
 1 Fasciation (1st flower of 2nd or 3rd inflorescence): 1 = Absent 2 = Occasionally present 3 = Frequently present

7. FRUIT (3rd fruit of 2nd or 3rd cluster): For the first 5 characters below, match your variety with the most similar illustration on pg. 5 of this form.

- 4 Typical fruit shape: 1 Shape of transverse section: 2 Shape of stem end:
 2-3 Shape of blossom end: 1 Shape of pistil scar:

- 1 Abscission layer: 1 = Present (pedicellate) 2 = Absent (jointless) 1 Point of detachment of fruit at harvest: 1 = At pedicel joint 2 = At calyx attachment
 2 0 mm length of pedicel (from joint to calyx attachment)
 0 8 0 mm length of mature fruit (stem axis) [] [] [] mm length, check var. no. [] []
 0 9 6 mm diameter of fruit at widest point [] [] [] mm diameter, check var. no. [] []
 3 7 7 g weight of mature fruit [] [] [] g weight, check var. no. [] []
 3 No. of locules: 1 = Two 2 = Three and four 3 = Five or more
 1 Fruit surface: 1 = Smooth 2 = Slightly rough 3 = Moderately rough or ribbed
 1 Fruit base color (mature-green stage): 1 = Light green ('Lanai', 'VF145-F5') 2 = Light gray-green ('Westover')
 3 = Apple or medium green ('Heinz 1439 VF') 4 = Yellow green
 5 = Dark green
 1 Fruit pattern (mature-green stage): 1 = Uniform green 2 = Green-shouldered 3 = Radial stripes on sides of fruit
 Shoulder color if different from base: 1 = Dark green 2 = Grey green 3 = Yellow green
 5 Fruit color, full-ripe: 1 = White 2 = Yellow 3 = Orange 4 = Pink 5 = Red
 6 = Brownish 7 = Greenish 8 = Other (Specify)
 3 Flesh color, full-ripe: 1 = Yellow 2 = Pink 3 = Red/Crimson 4 = Orange 5 = Other (Specify)
 1 Flesh color: 1 = Uniform 2 = With lighter and darker areas in walls
 3 Locular gel color of table-ripe fruit: 1 = Green 2 = Yellow 3 = Red
 2 Ripening: 1 = Blossom-to-stem end 2 = Uniform

7. FRUIT (3rd fruit of 2nd or 3rd cluster): Continued

<input type="checkbox"/> 1	Ripening:	1 = Inside out	2 = Uniformly	3 = Outside in	<input type="checkbox"/> 2	Stem scar size:	1 = Small ('Roma')
<input type="checkbox"/> 2	Epidermis color:	1 = Colorless	2 = Yellow			2 = Medium ('Rutgers')	3 = Large
<input type="checkbox"/> 1	Epidermis:	1 = Normal	2 = Easy-peel		<input type="checkbox"/> 2	Core:	1 = Coreless (absent or smaller than 6x6 mm)
<input type="checkbox"/> 2	Epidermis texture:	1 = Tender	2 = Average	3 = Tough		2 = Present	
<input type="checkbox"/> 3	Thickness of pericarp		<input type="checkbox"/> 3	Thickness of pericarp, check var. no.	<input type="checkbox"/>	<input type="checkbox"/>	
		1 = Under 3 mm	2 = 3-6 mm	3 = 6-9 mm		4 = Over 9 mm	

8. RESISTANCE TO FRUIT DISORDERS (Use code: 0 = Unknown, 1 = Susceptible, 2 = Resistant)

<input type="checkbox"/> 2	Blossom end rot	<input type="checkbox"/> 2	Catface	<input type="checkbox"/> 2	Fruit pox	<input type="checkbox"/> 1	Zippering
<input type="checkbox"/> 2	Blotchy ripening	<input type="checkbox"/> 2	Cracking, concentric	<input type="checkbox"/> 2	Gold fleck	<input type="checkbox"/>	Other (Specify)
<input type="checkbox"/> 2	Bursting	<input type="checkbox"/> 2	Cracking, radial	<input type="checkbox"/> 2	Graywall		

9. DISEASE AND PEST REACTION (Use code: 0 = Not tested, 1 = Susceptible, 2 = Resistant). NOTE: If claim of novelty is based wholly or in substantial part upon disease resistance, trial data should be appended. These should specify the method of testing, the reaction of the application variety, and reaction of well-known check varieties grown in the trial (identified by name).

VIRAL DISEASES:

<input type="checkbox"/> 0	Cucumber mosaic	<input type="checkbox"/> 0	Tobacco mosaic, Race 0	<input type="checkbox"/> 0	Tobacco mosaic, Race 2 ²
<input type="checkbox"/> 0	Curly top	<input type="checkbox"/> 0	Tobacco mosaic, Race 1	<input type="checkbox"/> 0	Tomato spotted wilt
<input type="checkbox"/> 0	Potato-Y virus	<input type="checkbox"/> 0	Tobacco mosaic, Race 2	<input type="checkbox"/> 0	Tomato yellows
<input type="checkbox"/>	Other virus (Specify)				

BACTERIAL DISEASES:

<input type="checkbox"/> 1	Bacterial canker (<i>Corynebacterium michiganense</i>)	<input type="checkbox"/> 0	Bacterial spot (<i>Xanthomonas vesicatorum</i>)
<input type="checkbox"/> 0	Bacterial soft rot (<i>Erwinia carotovora</i>)	<input type="checkbox"/> 0	Bacterial wilt, (<i>Pseudomonas solanacearum</i>)
<input type="checkbox"/> 0	Bacterial speck (<i>Pseudomonas tomato</i>)	<input type="checkbox"/> 0	Other bacterial disease (Specify)

FUNGAL DISEASES:

<input type="checkbox"/> 0	Anthraxnose (<i>Colletotrichum</i> spp.)	<input type="checkbox"/> 0	Leaf mold, Race 1 (<i>Cladosporium fulvum</i>)
<input type="checkbox"/> 0	Brown root rot or corky root, (<i>Pyrenochaeta lycopersici</i>)	<input type="checkbox"/> 0	Leaf mold, Race 2
<input type="checkbox"/> 0	Collar rot or stem canker, (<i>Alternaria solani</i>)	<input type="checkbox"/> 0	Leaf mold, Race 3
<input type="checkbox"/> 1	Early blight defoliation, (<i>Alternaria solani</i>)	<input type="checkbox"/> 0	Leaf mold, other races (Specify)
<input type="checkbox"/> 2	Fusarium wilt, Race 1, (<i>F. oxysporum f. lycopersici</i>)	<input type="checkbox"/> 0	Nailhead spot (<i>Alternaria tomato</i>)
<input type="checkbox"/> 2	Fusarium wilt, Race 2	<input type="checkbox"/> 0	Septoria leafspot (<i>S. lycopersici</i>)
<input type="checkbox"/> 0	Fusarium wilt, Race 3	<input type="checkbox"/> 0	Target leafspot (<i>Corynespora cassicola</i>)
<input type="checkbox"/> 0	Gray leaf spot (<i>Stemphylium</i> spp.)	<input type="checkbox"/> 2	Verticillium wilt, Race 1 (<i>V. albo-atrum</i>)
<input type="checkbox"/> 0	Late blight, Race 0, (<i>Phytophthora infestans</i>)	<input type="checkbox"/> 0	Verticillium wilt, Race 2
<input type="checkbox"/> 0	Late blight, Race 1	<input type="checkbox"/>	Other fungal disease
		<input type="checkbox"/>	Other fungal disease

9. DISEASE AND PEST REACTION (Use code: 0 = Not tested, 1 = Susceptible, 2 = Resistant - Continued)

INSECTS AND PESTS:

- 0 Colorado potato beetle (*Leptinotarsa decemlineata*) 0 Tomato hornworm (*Manduca quinquemaculata*)
- 0 Southern root knot nematode (*Meloidogyne incognita*) 0 Tomato fruitworm (*Heliothis zea*)
- 0 Spider mites (*Tetranychus* spp.) 0 Whitefly (*Trialeurodes vaporariorum*)
- 0 Sugar beet army worm (*Spodoptera exigua*) Other (Specify) _____
- 0 Tobacco flea beetle (*Epitrix hirtipennis*) _____

POLLUTANTS:

- 0 Ozone 0 Sulfur dioxide Other (Specify) _____

10. CHEMISTRY AND COMPOSITION OF FULL-RIPE FRUITS: Suggested test methods may be found in "Tomato Products," 5th ed., National Canners Assn. Bull. 27-L. Please specify test methods or give a reference to methods used. Fill in table below with values for the new variety and for at least one well-known check variety of similar type grown in the same trial. Specify names or numbers of check varieties.

	SUBMITTED VARIETY	Check Variety Pikred	Check Variety	Check Variety
pH	4.1	4.2		
Titrateable acidity, as % citric				
Total solids (dry matter, seeds and skin removed)				
Soluble solids, as °Brix at 21° C	3.8	4.5		

11. PHENOLOGY: Express length of developmental stages either as calendar days or as heat units (growing degree days), in degrees Celsius. If heat units are used, indicate the base temperature used in their calculation here _____ °C. See paper by Warnock under "References" for method. Give comparative data for at least one check variety; identify checks by name or by number from table on page 1.

	APPLICATION VARIETY	Check variety Pikred	Check variety	Check variety
Seeding to 50% flower (1 open flower on 50% of plants)	66.3 days	61.2 days		
Seed to once-over harvest (if applicable)				

2 Fruiting season: 1 = Long ('Marglobe') 2 = Medium ('Westover') 3 = Short, concentrated ('VF 145')
4 = Very concentrated ('UC 82')

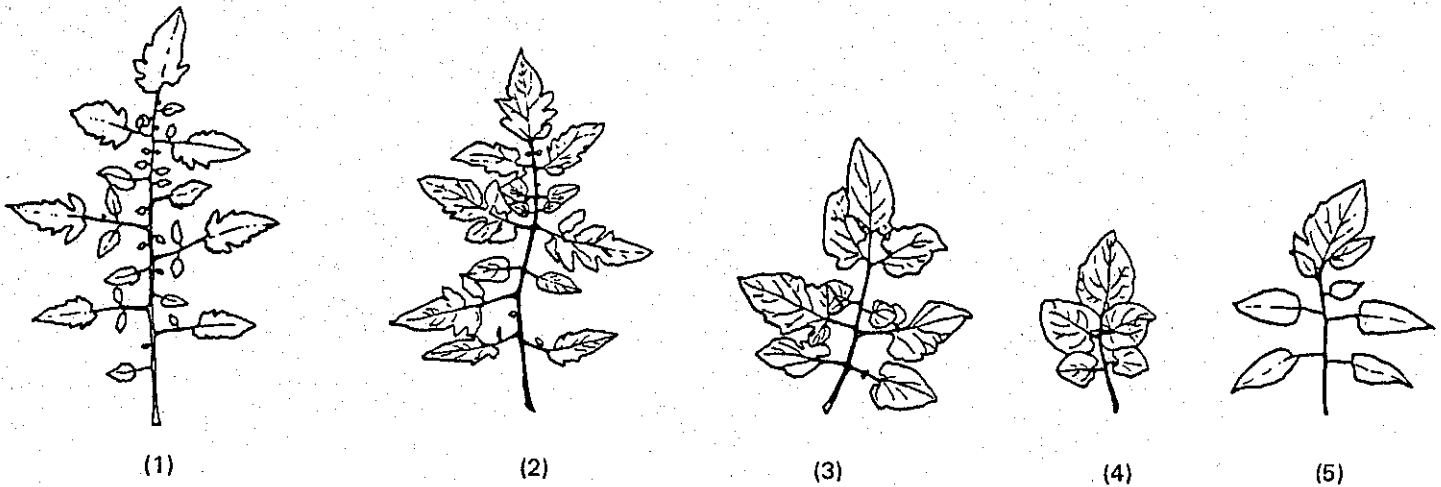
3 Relative maturity in areas tested: 1 = Early 2 = Medium early 3 = Medium
4 = Medium late 5 = Late 6 = Variable (if relative maturity is known to differ by location or environment, please explain on separate sheet).

12. ADAPTATION: If more than one category applies, list all in rank order.

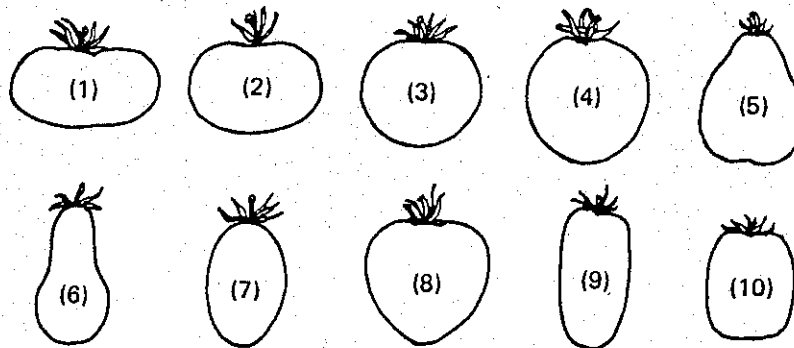
- 1 Culture: 1 = Field 2 = Greenhouse
- 2 5 Principal use(s): 1 = Home garden 2 = Fresh market 3 = Whole-pack canning
4 = Concentrated products 5 = Other (Specify) Parent for F₁ Hybrid
- 1 Machine harvest: 1 = Not adapted 2 = Adapted
- 3 2 1 Regions to which adaptation has been demonstrated:
1 = Northeast 2 = Mid Atlantic 3 = Southeast 4 = Florida
5 = Great Plains 6 = South-central 7 = Intermountain West 8 = Northwest
9 = California: Sacramento and Upper San Joaquin Valley
10 = California: Coastal areas 11 = California: Southern San Joaquin Valley & deserts

ILLUSTRATIONS OF TOMATO LEAF AND FRUIT CHARACTERISTICS

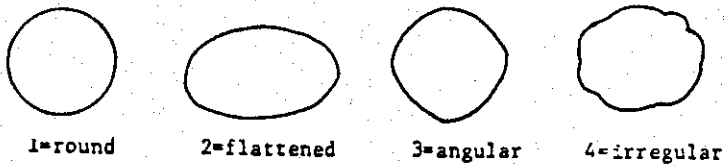
4. LEAF: Morphology:



7. FRUIT: Typical fruit shape:



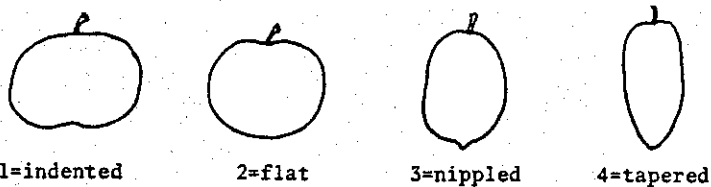
Shape of transverse section:



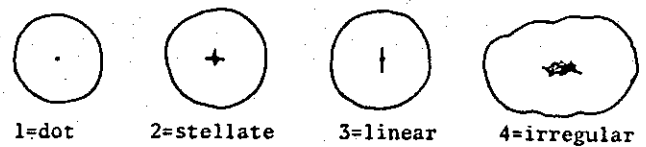
Shape of stem end:



Shape of blossom end:



Shape of pistil scar:



REFERENCES

Anonymous, 1976. All About Tomatoes. Ortho Books, Chevron Chemical Co., San Francisco. In three volumes: Midwest/Northeast Edition, West Edition, and South Edition

Ware, G.W. & J. P. McCollum, 1968. Producing Vegetable Crops. The Interstate Printer & Publishers, Inc., Danville, Illinois. Chapter 30, pp. 451-473, "Tomatoes".

Warnock, S.J. 1978. Using Tomato Heat Units. Leaflet No. 6, Campbell Institute for Agricultural Research, Camden, NJ. 10 p.

Webb, R.E., T. H. Barksdale, & A. K. Stoner, 1973, "Tomatoes", pp. 344-361, In: Nelson, R.R. (Ed.), Breeding Plants for Disease Resistance. Pennsylvania State University Press, University Park.

Young, P.A. & J.W. MacArthur, 1947. Horticultural characters of tomatoes. Bull. Texas Agric. Exper. Station No. 698.

Exhibit D. Additional Description of NC 84173

NC 84173 had significantly less of the fruit defects of fruit cracking and rough blossom scar than the cultivar Pikred (Table 1).

NC 84173 produced very large fruit with a high percentage greater than 3½" in diameter (Table 2).

NC 84173 was later in maturity than the cultivar Pikred (Table 3).

NC 84173 produced total fruit yields equivalent to or greater than the cultivar Pikred and produced much higher graded yields than Pikred (Tables 4 and 5).

Table 1. Fruit defects (%) of 'Mountain Spring' F₁ hybrid tomato compared to its parent lines and to 'Pikred'. MHCRS, Fletcher, NC.

	<u>Fruit Cracking</u>		<u>Rough Blossom Scar</u>	
	<u>1987</u>	<u>1988</u>	<u>1987</u>	<u>1988</u>
Pikred	70	50	41	22
Mountain Spring	19	9	29	6
NC 84173	29	34	23	4
NC 8276	-	6	-	12
LSD (.05)	8	6	10	5

Table 2. Fruit size of 'Mountain Spring' F₁ hybrid tomato compared to its parent lines and to 'Pikred'. MHCRS, Fletcher, NC.

	<u>Grams/fruit</u>			<u>Jumbo (%)</u> <u>> 3½" diam.</u>			<u>Extra-large (%)</u> <u>3 - 3½" diam.</u>		
	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
	Pikred	286	270	281	48	33	44	37	57
Mountain Spring	350	329	355	76	69	75	21	29	23
NC 84173	395	360	377	84	78	79	15	21	19
NC 8276	--	295	309	--	55	59	--	39	34
LSD (.05)	32	23	17	15	9	11	15	6	9

Table 3. Early season yield (20-lb. boxes/acre in 1st. 2 weeks of harvest) of 'Mountain Spring' F₁ hybrid tomato compared to its parent lines and to 'Pikred'. MHCRS, Fletcher, NC.

	<u>Year</u>		
	<u>1987</u>	<u>1988</u>	<u>1989</u>
Pikred	2040	2062	1126
Mountain Spring	2090	1735	816
NC 84173	1200	1443	850
NC 8276	--	1493	668
LSD (.05)	380	196	214

Table 4. Total yield (20-lb. boxes/acres) of 'Mountain Spring' F₁ hybrid tomato compared to its parent lines and to 'Pikred'. MHCRS, Fletcher, NC.

	Year		
	1987	1988	1989
Pikred	4660	4310	4179
Mountain Spring	4940	5000	4616
NC 84173	4370	4983	4471
NC 8276	--	4724	3923
LSD (.05)	NS	592	NS

Table 5. U.S. Combination Grade yield (U.S. No. 1 + U.S. No.2) of 'Mountain Spring' F₁ hybrid tomato compared to its parent lines and to 'Pikred'. MHCRS, Fletcher, NC.

	Year		
	1987	1988	1989
Pikred	460	931	499
Mountain Spring	1970	2682	2552
NC 84173	1430	1817	1347
NC 8276	--	2742	1619
LSD (.05)	460	413	620

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TOMATO

NC 84173

Exhibit E. Statement of The Basis of Applicant's Ownership

NC 84173 was developed by Dr. R. G. Gardner, Associate Professor of Horticultural Science and plant breeder with the N. C. Agricultural Research Service (NCARS), College of Agriculture and Life Sciences, N. C. State University. NC 84173 is owned exclusively by the NCARS which retains all rights to its use.