

No.



201400411

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Enza Zaden Beheer B.V.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

An application requesting a certificate of protection for an alleged distinct variety of sexually reproduced, or tuber propagated plant, the name and description of which are contained in the application and exhibits, 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 TWENTY 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, or importing it, or exporting it, or conditioning it for propagation, or stocking it for any of the above purposes, or using it in producing a hybrid or different variety there from, to the extent provided by the PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

TOMATO (F1)

'Avalantino'



Attest:

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 twenty-ninth day of September, in the year two thousand and fifteen.

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE <i>(Instructions and information collection burden statement on reverse)</i>		The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995. 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 OWNER		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME	3. VARIETY NAME
Enza Zaden Beheer B.V.		E23.34008	Avalantino
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)		5. TELEPHONE (include area code)	FOR OFFICIAL USE ONLY
Haling 1e 1602DB Enkhuizen The Netherlands		+31 228 350100	PVPO NUMBER
		6. FAX (include area code)	201400411
		+31 228 315960	FILING DATE
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.)		8. IF INCORPORATED, GIVE STATE OF INCORPORATION	9. DATE OF INCORPORATION
Corporation		Noord-Holland, the Netherlands	1938
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers)		11. TELEPHONE (include area code)	FILING AND EXAMINATION FEES:
Enza Zaden Beheer B.V. Haling 1e 1602DB Enkhuizen The Netherlands		+31 228 350100	\$ 4,382
		12. FAX (include area code)	DATE July 30, 2014
		+31 228 315960	CERTIFICATION FEE:
			\$
			DATE
13. E-MAIL			
m.bleeker@enzazaden.nl			
14. CROP KIND (Common Name)		15. GENUS AND SPECIES NAME OF CROP	16. FAMILY NAME (Botanical)
Tomato		Lycopersicon esculentum Mill.	Solanaceae
17. IS THE VARIETY A FIRST GENERATION HYBRID?		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL)	20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<input type="checkbox"/> YES (If "yes", answer items 21 and 22 below)
		IF YES, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	<input checked="" type="checkbox"/> NO (If "no", go to item 23)
			<input type="checkbox"/> UNDECIDED
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?	
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety		<input type="checkbox"/> YES <input type="checkbox"/> NO	
b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness		IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	
d. <input type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional)		<input type="checkbox"/> YES <input type="checkbox"/> NO	
e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership		IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.	
f. <input checked="" type="checkbox"/> Filing and Examination Fee (\$4,382), make checks payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) and have payment explained in the instructions (If additional explanation is necessary, please use the space indicated on the reverse.)		___ FOUNDATION ___ REGISTERED ___ CERTIFIED	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?		24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)?	
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
25. The owners declare that a viable sample of basic seed will be furnished directly to an acceptable depository in support of the variety within three months of filing. Seed will be replenished upon request in accordance with such regulations as may be applicable. For a tuber propagated variety or vegetative propagated parent of the variety, a tissue culture or vegetative sample will be deposited in a public repository within three months of the date of the certificate fee request letter. These will be maintained for the duration of the certificate.			
The undersigned owner(s) is (are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER		SIGNATURE OF OWNER	
NAME (Please print or type)		NAME (Please print or type)	
J.J.M. Lambalk			
CAPACITY OR TITLE		CAPACITY OR TITLE	
Director			
DATE		DATE	
July 28, 2014			

Unofficial Copy

Continuation Page from ST – 470 (Application for Plant Variety Protection Certificate)

22. CONTINUED FROM FRONT *(Please provide a statement as to the limitation and sequence of generations that may be certified.)*

23. CONTINUED FROM FRONT *(Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)*

Avalantino has been sold in Canada on November 21, 2012
Avalantino has not been sold in the U.S.A. so far.

24. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

201400411

EXHIBIT A

Origin and Breeding History of Tomato, Avalantino

Avalantino is a hybrid fresh market tomato adapted to growing conditions in greenhouse climate. Avalantino is produced by the cross between OT2142 (seed parent) and OT3009 (pollen parent). Selection criteria for the development of this variety include yield, plant type, brix, firmness, fruit color, greenhouse adaptability.

OT2142 (seed parent): this tomato breeding line was developed using pedigree selection. The breeding work was conducted in field plots located at the Enza Zaden Research Station located in Enkhuizen, Netherlands. Accession LYC 04043 was harvested from the greenhouse in Enkhuizen and used to create a large segregating population that was planted in Enkhuizen. Six generations of individual horticultural pedigree selections followed, with the line being bulked in 2005 for Foundation Seed. The breeding history for line OT2142 is as follows:

2002 Enkhuizen, Netherlands	F2	(LYC 04043)
	↓	
2002 Enkhuizen, Netherlands	F3	(LYC 04043)
	↓	
2003 Enkhuizen, Netherlands	F4	(LYC 04043)
	↓	
2003 Enkhuizen, Netherlands	F5	(LYC 04043)
	↓	
2004 Enkhuizen, Netherlands	F6	(LYC 04043)
	↓	
2004 Enkhuizen, Netherlands	F7	(LYC 04043)
	↓	
2005 Enkhuizen, Netherlands	F8	Line bulked, designated as OT3009 and submitted to FS for seed increase

OT3009 (pollen parent): this tomato breeding line was developed using a combination of crossing and pedigree selection. All crossing and pedigree selection was conducted in greenhouses at the Enza Zaden Research Station located in Enkhuizen, Netherlands. Breeding line 2003.43887 is used as a resistant source for Tobacco Mosaic Virus (ToMV), Oidium Neolycopersici (On), Fusarium Oxysporum race 0 and 1 (Fol:0 and Fol:1). Breeding line 2003.43939 is used as a source for high brix level. A cross between these breeding lines was made, followed by 8 generations of single plant pedigree selection and then bulked in F10 for Foundation Seed. The resistances were assessed by Polymerase Chain Reaction (PCR) and confirmed by bio assay. The breeding history for line OT3009 is as follows:

2003 Enkhuizen, Netherlands	F1	(2003.43887 x 2003.43939)
	↓	
2004 Enkhuizen, Netherlands	F2	
	↓	
2004 Enkhuizen, Netherlands	F3	
	↓	
2005 Enkhuizen, Netherlands	F4	Line tested as fixed for ToMV resistance
	↓	
2005 Enkhuizen, Netherlands	F5	Line tested as fixed for Fol:0 and Fol:1 resistance
	↓	
2006 Enkhuizen, Netherlands	F6	
	↓	
2006 Enkhuizen, Netherlands	F7	Line tested as fixed for On resistance
	↓	
2007 Enkhuizen, Netherlands	F8	
	↓	
2007 Enkhuizen, Netherlands	F9	
	↓	
2008 Enkhuizen, Netherlands	F10	Line bulked, designated as OT3009 and submitted to FS for seed increase

Avalantino is a hybrid tomato intended for greenhouse production and offers a good yield potential with an excellent high brix level for its fruit size. The fruits have a deep red color, a good skin quality and are small and uniform. The

plants are easy to grow with an open plant habit and grow straight to the wire. There is no specific suggested transplanting dates, transplanting can be done year round.

From observations made during the 2010 and 2011 growing season, Avalantino was found to be uniform and stable within commercially acceptable limits. No genetic variants are known and, to date, this hybrid has been observed to be completely uniform and stable for at least two seasons.

EXHIBIT B
Statement of Distinctness for Tomato, Avalantino

Avalantino is a hybrid tomato adapted to greenhouse growing conditions. This hybrid has excellent horticultural characteristics: its vines are uniform, a good plant habit, grows straight to the wire and exceptional fruit set capabilities. The fruits are small, uniform in size and shape, have a deep red color and an excellent brix level for its fruit size. Avalantino is resistant to Tomato Mosaic Virus Strain 0,1 and 2; Flavia Fulvum Race A, B, C, D and E; Verticillium Albo-Atrum; Verticillium Dahlia, Fusarium Oxysporium Race 0 and 1; Fusarium Oxysporium Crown and Root Rot. Avalantino is tolerant to Oidium Neolycopersici; Silvering.

To our knowledge, the most similar variety to Avalantino is variety Roterno, a widely adapted hybrid tomato in the greenhouse business for the taste segment. The characteristics which best distinguish these two varieties include, but may not be limited to:

- **Internode Length:** the Internode Length (Length between 2 vines) of Avalantino is 34 cm whereas the Internode Length of Roterno is 30 cm.
- **Leaf attitude** (in middle 3th of the plant): The leaf attitude of Avalantino is horizontal to semi-drooping, whereas the Leaf attitude of Roterno is semi-erect.
- **Leaf attitude of petiole of leaflet in relation to main axis** (in middle 3th of the plant): The Leaf attitude of petiole of leaflet in relation to main axis of Avalantino is horizontal to semi-erect, whereas the leaf attitude of petiole of leaflet in relation to main axis of Roterno is erect (See photo 1)
- **Intensity of green color** (before maturity): The intensity of green color of Avalantino is light green, whereas the intensity of green color of Roterno is medium green. (see photo 2)
- **Color of the gel** (inside the fruit): The color of the gel of Avalantino is dark green, whereas the color of the gel of Roterno is light green. (see photo 2)



Photo 2

REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved OMB NO 0581-0055

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C

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

NAME OF APPLICANT (S) Enza Zaden Beheer B.V.	TEMPORARY OR EXPERIMENTAL DESIGNATION E23.34008	VARIETY NAME Avalantino
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country) Haling 1e 1602 DB Enkhuizen The Netherlands		PVPO NUMBER

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 zeros 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. Indicated by check whether trial data are from green house or field planting. Trials direct-seeded or transplanted; staked or unstaked . Give locations and dates of seeding and transplanting here:

Exhibit A refers.

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 Dada | 10 = New Yorker | 16 = Sunray | 22 = Other (Specify) <u>Rotero</u> |
| 5 = Florida MH-1 | 11 = Ohio MR-13 | 17 = Tropic | |
| 6 = Heinz 1350 | 12 = Red Cherry Large | | |

1. SEEDLING

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

2. MATURE PLANT (at maximum vegetative development)

11 5 0 CM Height
1 Growth: 1 = Indeterminate 2 = Determinate
2 Form: 1 = Lax, open 2 = Normal 3 = Compact 4 = Dwarf 5 = Brachytic
2 Size of canopy (compared to others of similar type): 1 = Small 2 = Medium 3 = Large
2 Habit: 1 = Sprawling (decumbent) 2 = Semi-erect 3 = Erect ('Dwarf Champion')

3. STEM

- 2 Branching: 1 = Sparse ('Brehm's Solid Red', 'Fireball') 2 = Intermediate ('Westover') 3 = Profuse ('UC 82')
- 1 Branching at cotyledonary or first leafy node: 1 = Present 2 = Absent
- 3 No. of nodes between first inflorescence: 1 = 1-4 2 = 4-7 3 = 7-10 4 = 10 or more
- 1 No. of nodes between early (1st - 2nd, 2nd - 3rd) inflorescences. 1 No. of nodes between later developing inflorescences.
- 1 Pubescence on younger stems: 1 = Smooth (no long hairs) 2 = Sparsely hairy (scattered long hairs) 3 = Moderately hairy 4 = Densely hairy or wooly

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

- 1 Type: 1 = Tomato 2 = Potato ('Trip-L-Crop') 2 Morphology (choose illustration at the end of this form that is most similar)
- 2 Margins of major leaflets: 1 = Nearly entire 2 = Shallowly toothed or scalloped 3 = Deeply toothed or cut, sps. Toward base
- 1 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
- 1 Surface of major leaflets: 1 = Smooth 2 = Rugose (bumpy or veiny)
- 2 Pubescence: 1 = Smooth (no long hairs) 2 = Normal 3 = Hirsute 4 = Wooly

5. INFLORESCENCE (make observations on 3rd inflorescence)

- 1 Type: 1 = Simple 2 = Forked (2 major axes) 3 = Compound (much branched)
- 1 2 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
- 2 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 3rd or 3rd cluster) For the first 5 characters below, match your variety with the most similar illustration on pages at the end of this form.

- 2 Typical fruit shape 1 Shape of transverse section 1 Shape of stem end
- 2 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
- 1 4 MM length of pedicel (from joint to calyx attachment)
- 4 8 MM length of mature fruit (stem axis) 5 1 MM length h, check var. no. 2 2
- 5 6 MM diameter of fruit at widest point 5 9 MM diameter, check var. no. 2 2
- 7 5 G weight of mature fruit 8 5 G weight, check var. no. 2 2
- 1 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', 'VF 145-F5') 2 = Light gray-green 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

7. FRUIT (continued)

- ____ 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
- 2 Ripening: 1 = Inside out 2 = Uniformly 3 = Outside in
- 2 Stem scar size: 1 = Small ('Roma') 2 = Medium ('Rutgers') 3 = Large
- 1 Core: 1 = Coreless (absent or smaller than 6x6 MM) 2 = Present
- 2 Epidermis color: 1 = Colorless 2 = Yellow
- 1 Epidermis: 1 = Normal 2 = Easy-peel
- 2 Epidermis texture: 1 = Tender 2 = Average 3 = Tough
- 7 Thickness of pericarp _____ 9 Thickness of pericarp. Check var. no. 2 2
- 2 Anthocyanin in hypocotyl of 2 - 15 mc seedling: 1 = Absent 2 = Present 1 Habit of 3 - 4 week old seedling: 1 = Normal 2 = Compact

8. RESISTANCE TO FRUIT DISORDER

0 = Not Tested 1 = Highly Resistant 2 = Resistant Few Symptoms 3 = Resistance Few Symptom in Number and Size 4 = Moderately Resistance
5 = Intermedia Susceptible 6 = Moderate Susceptible 7 = Susceptible 9 = Highly Susceptible

NOTE If claim of novelty is based wholly or in substantial part upon resistance, trial data should be appended. These should specify the method of testing, the reaction of the applicant variety, and reaction of well-known check varieties grown in the trial (identified by name).

- | | | | |
|---------------------------|-------------------------------|---------------------|----------------------------|
| <u>2</u> Blossom end rot | <u>1</u> Catface | <u>0</u> Fruit pox | <u>0</u> Zippering |
| <u>1</u> Blotchy ripening | <u>2</u> Cracking, concentric | <u>0</u> Gold fleck | ____ Other (specify) _____ |
| <u>0</u> Bursting | <u>2</u> Cracking, radial | <u>1</u> Graywall | |

9. DISEASE AND PEST REACTION

0 = Not Tested 1 = Highly Resistant 2 = Resistant Few Symptoms 3 = Resistance Few Lesions in Number and Size 4 = Moderately Resistance
5 = Intermedia Susceptible 6 = Moderate Susceptible 7 = Susceptible 9 = Highly Susceptible

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 applicant's variety, and reaction of well-known check varieties grown in the trial (identified by name).

Viral Diseases:

0 Cucumber mosaic 1 Tobacco mosaic, Race 0 0 Tobacco mosaic, Race 2²
0 Curly top 1 Tobacco mosaic, Race 1 0 Tomato spotted wilt
0 Potato-Y virus 1 Tobacco mosaic, Race 2 0 Tomato yellows
1 Blotchy ripening 2 Cracking, concentric 0 Gold fleck
 Other virus (specify) _____

Bacterial Diseases:

0 Bacterial canker (*Corynebacterium michiganense*) 0 Bacterial spot (*Xanthomonas vesicatorium*)
0 Bacterial soft rot (*Erwinia carotovora*) 0 Bacterial wilt (*Pseudomonas solanacearum*)
0 Bacterial speck (*Pseudomonas tomato*) Other bacterial disease (specify) _____

Fungal Diseases:

0 Anthracnose (*Colletotrichum* spp.) 1 Leaf mold, Race 1 (*Cladosporium fulvum*) (Fulvia fulva new name)
0 Brown root rot or corky root (*Pyrenochaeta lycopersici*) 1 Leaf mold, Race 2 (*Cladosporium fulvum*) internet search to verify LAWC 10/8/14
0 Collar rot or stem canker (*Alternaria solani*) 1 Leaf mold, Race 3 (*Cladosporium fulvum*)
0 Early blight defoliation (*Alternaria solani*) 0 Leaf mold, other races (specify) _____
1 Fusarium wilt, Race 1 (*F. oxysporum f. lycopersici*) 0 Nailhead spot (*Alternaria tomato*)
1 Fusarium wilt, Race 2 (*F. oxysporum f. lycopersici*) 0 Seporia leafspot (*S. lycopersici*)
0 Fusarium wilt, Race 3 (*F. oxysporum f. lycopersici*) 0 Target leafspot (*Corynespora casicola*)
0 Gray leaf spot (*Stemphylium* spp.) 1 Verticillium wilt, Race 1 (*V. albo-atrum*)
0 Late blight, Race 0 (*Phytophthora infestans*) 0 Verticillium wilt Race 2
0 Late blight, Race 1 2 Other fungal disease (specify) Oidium lycopersicum

Insects and Pests:

0 Colorado potato beetle (*Leptinotarsa de celineata*) 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 exiguus*) Other (specify) _____
0 Tobacco flea beetle (*Epitrix hirtipennis*)

Pollutants:

 Ozone 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 Roterno	Check Variety	Check Variety
pH				
Titrateable acidity, as % citric	0,34	0,30		
Total solids (dry matter, seeds and skin removed)				
Soluble solids as °Brix	5,8	5,1		

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	Check Variety	Check Variety
Seeding to 50% flow (1 open on 50% of plants)				
Seed to once over harvest (if applicable)	94%			

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

2 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.

2 Culture: 1 = Field 2 = Greenhouse

2 Principle use(s): 1 = Home garden 2 = Fresh market 3 = Whole-pack canning 4 = Concentrated products
5 = Other (specify) _____

1 Machine harvest: 1 = Not adapted 2 = Adapted

10 11 3 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

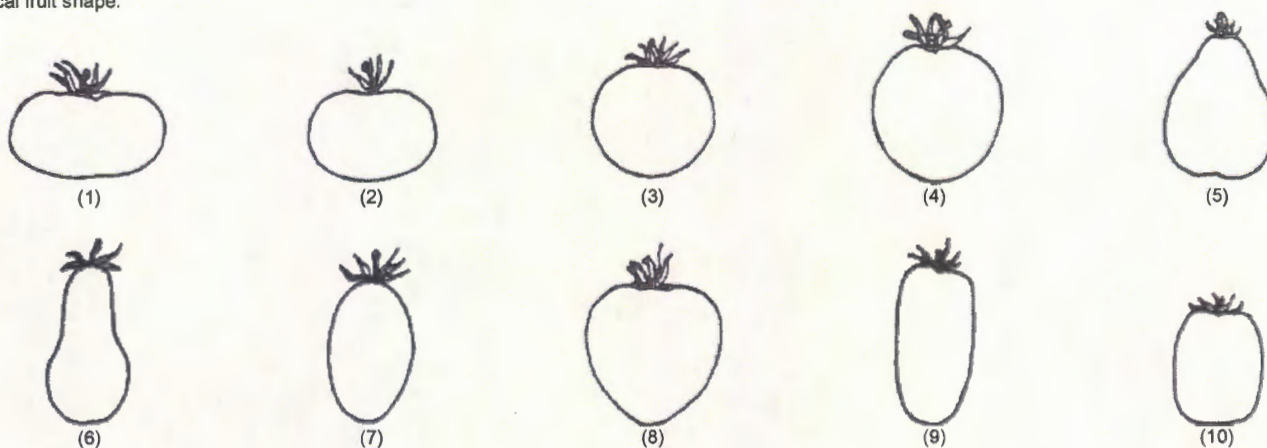
4. LEAF

Morphology:

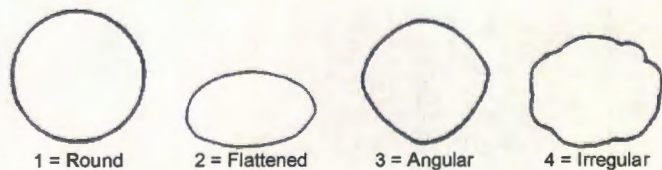


7. FRUIT

Typical fruit shape:



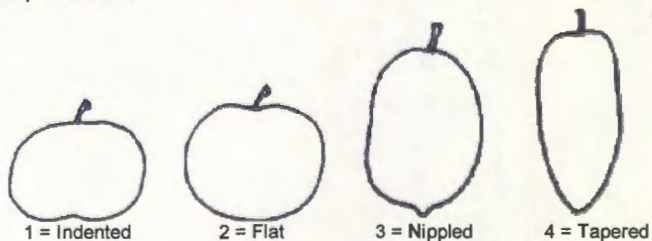
Shape of transverse section:



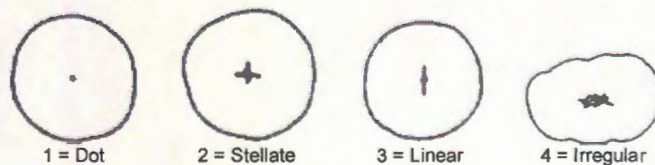
Shape of stem end:



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.
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Photo 1

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**U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705**

EXHIBIT

201400411

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

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country)		FOR OFFICIAL USE ONLY PVPO NUMBER most similar variety <h1 align="center">Roterno</h1>

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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 zeros when necessary (e.g., 09 or 081, 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. Indicated by check whether trial data are from green house ___ or field ___ planting. Trials direct-seeded ___ or transplanted; staked ___ or unstaked ___. Give locations and dates of seeding and transplanting here:

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 Dada | 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 | | |

1. SEEDLING

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

2. MATURE PLANT (at maximum vegetative development)

 1100 CM Height
 1 Growth: 1 = Indeterminate 2 = Determinate
 2 Form: 1 = Lax, open 2 = Normal 3 = Compact 4 = Dwarf 5 = Brachytic
 2 Size of canopy (compared to others of similar type): 1 = Small 2 = Medium 3 = Large
 2 Habit: 1 = Sprawling (decumbent) 2 = Semi-erect 3 = Erect ('Dwarf Champion')

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3. STEM

- 2_ Branching: 1 = Sparse ('Brehm's Solid Red', 'Fireball') 2 = Intermediate ('Westover') 3 = Profuse ('UC 82')
- 1_ Branching at cotyledonary or first leafy node: 1 = Present 2 = Absent
- 3_ No. of nodes between first inflorescence: 1 = 1-4 2 = 4-7 3 = 7-10 4 = 10 or more
- 1_ No. of nodes between early (1st - 2nd, 2nd - 3rd) inflorescences. 1_ No. of nodes between later developing inflorescences.
- 1_ Pubescence on younger stems: 1 = Smooth (no long hairs) 2 = Sparsely hairy (scattered long hairs) 3 = Moderately hairy 4 = Densely hairy or wooly

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

- 1_ Type: 1 = Tomato 2 = Potato ('Trip-L-Crop') 2_ Morphology (choose illustration at the end of this form that is most similar)
- 2_ Margins of major leaflets: 1 = Nearly entire 2 = Shallowly toothed or scalloped 3 = Deeply toothed or cut, sps. Toward base
- 1_ 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
- 1_ Surface of major leaflets: 1 = Smooth 2 = Rugose (bumpy or veiny)
- 2_ Pubescence: 1 = Smooth (no long hairs) 2 = Normal 3 = Hirsute 4 = Wooly

5. INFLORESCENCE (make observations on 3rd inflorescence)

- 1_ Type: 1 = Simple 2 = Forked (2 major axes) 3 = Compound (much branched)
- 1_ 0_ 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
- 2_ 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 3rd or 3rd cluster) For the first 5 characters below, match your variety with the most similar illustration on pages at the end of this form.

- 2_ Typical fruit shape 1_ Shape of transverse section 1_ Shape of stem end
- 2_ 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
- 1_ 3_ MM length of pedicel (from joint to calyx attachment)
- 5_ 1_ MM length of mature fruit (stem axis) MM length, check var. no.
- 5_ 9_ MM diameter of fruit at widest point MM diameter, check var. no.
- 8_ 5_ G weight of mature fruit G weight, check var. no.
- 1_ 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
- 2_ Fruit base color (mature-green stage):
1 = Light green ('Lanai', 'VF 145-F5') 2 = Light gray-green 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

7. FRUIT (continued)

- ___ 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
- _2_ Locular gel color of table-ripe fruit: 1 = Green 2 = Yellow 3 = Red
- _2_ Ripening: 1 = Blossom-to-stem end 2 = Uniform
- _2_ Ripening: 1 = Inside out 2 = Uniformly 3 = Outside in
- _2_ Stem scar size: 1 = Small ('Roma') 2 = Medium ('Rutgers') 3 = Large
- _1_ Core: 1 = Coreless (absent or smaller than 6x6 MM) 2 = Present
- _2_ Epidermis color: 1 = Colorless 2 = Yellow
- _1_ Epidermis: 1 = Normal 2 = Easy-peel
- _2_ Epidermis texture: 1 = Tender 2 = Average 3 = Tough
- _9_ Thickness of pericarp _____ Thickness of pericarp. Check var. no. _____
- _2_ Anthocyanin in hypocotyl of 2 – 15 mc seedling: 1 = Absent 2 = Present _1_ Habit of 3 – 4 week old seedling: 1 = Normal 2 = Compact

8. RESISTANCE TO FRUIT DISORDER

0 = Not Tested 1 = Highly Resistant 2 = Resistant Few Symptoms 3 = Resistance Few Symptom in Number and Size 4 = Moderately Resistance
5 = Intermedia Susceptible 6 = Moderate Susceptible 7 = Susceptible 9 = Highly Susceptible

NOTE If claim of novelty is based wholly or in substantial part upon resistance, trial data should be appended. These should specify the method of testing, the reaction of the applicatoni variety, and reaction of well-known check varieties grown in the trial (identified by name).

- | | | | |
|----------------------|--------------------------|----------------|---------------------------|
| _2_ Blossom end rot | _1_ Catface | _0_ Fruit pox | _0_ Zippering |
| _1_ Blotchy ripening | _2_ Cracking, concentric | _0_ Gold fleck | ___ Other (specify) _____ |
| _0_ Bursting | _2_ Cracking, radial | _1_ Graywall | |

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9. DISEASE AND PEST REACTION

0 = Not Tested 1 = Highly Resistant 2 = Resistant Few Symptoms 3 = Resistance Few Lesions in Number and Size 4 = Moderately Resistance
5 = Intermedia Susceptible 6 = Moderate Susceptible 7 = Susceptible 9 = Highly Susceptible

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 applicatoni variety, and reaction of well-known check varieties grown in the trial (identified by name).

Viral Diseases:

- _0_ Cucumber mosaic _1_ Tobacco mosaic, Race 0 _0_ Tobacco mosaic, Race2²
0 Curly top _1_ Tobacco mosaic, Race 1 _0_ Tomato spotted wilt
0 Potato-Y virus _2_ Tobacco mosaic, Race 2 _0_ Tomato yellows
1 Blotchy ripening _2_ Cracking, concentric _0_ Gold fleck
1 Other virus (specify) ___Tomato Spotted Wilt Virus_____

Bacterial Diseases:

- _0_ Bacterial canker (*Corynebacterium michiganense*) _0_ Bacterial spot (*Xanthomonas vesicatorium*)
0 Bacterial soft rot (*Erwinia corotovora*) _0_ Bacterial wilt (*Pseudomonas solanacearum*)
0 Bacterial speck (*Pseudomonas tomato*) ___ Other bacterial disease (specify) _____

Fungal Diseases:

- _0_ Anthracnose (*Colletotrichum* spp.) _1_ Leaf mold, Race 1 (*Cladosporium fulvum*)
0 Brown root rot or corky root (*Pyrenochaeta lycopersici*) _1_ Leaf mold, Race 2 (*Cladosporium fulvum*)
0 Collar rot or stem canker (*Alternaria solani*) _1_ Leaf mold, Race 3 (*Cladosporium fulvum*)
0 Early blight defoliation (*Alternaria solani*) _0_ Leaf mold, other races (specify) _____
1 Fusarium wilt, Race 1 (*F. oxysporum f. lycopersici*) _0_ Nailhead spot (*Alternaria tomato*)
1 Fusarium wilt, Race 2 (*F. oxysporum f. lycopersici*) _0_ Seporia leafspot (*S. lycopersici*)
0 Fusarium wilt, Race 3 (*F. oxysporum f. lycopersici*) _0_ Target leafspot (*Corynespora casiicola*)
0 Gray leaf spot (*Stemphylium* spp.) _1_ Verticillium wilt, Race 1 (*V. albo-atrum*)
0 Late blight, Race 0 (*Phytophthora infestans*) _2_ Verticillium wilt Race 2
0 Late blight, Race 1 _1_ Other fungal disease (specify) ___Oidium Lycopersicum_____

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:

- ___ Ozone ___ Sulfur dioxide ___ Other (specify) _____

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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	Check Variety	Check Variety
pH				
Titrateable acidity, as % citric	0,30			
Total solids (dry matter, seeds and skin removed)				
Soluble solids as °Brix	5,1			

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 calculatoin hear ____°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	Check Variety	Check Variety
Seeding to 50% flow (1 open on 50% of plants)				
Seed to once over harvest (if applicable)				

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

2 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 that one category applies, list all in rank order.

2 Culture: 1 = Field 2 = Greenhouse

2 _____ Principle use(s): 1 = Home garden 2 = Fresh market 3 = Whole-pack canning 4 = Concentrated products
5 = Other (specify) _____

1__ Machine harvest: 1 = Not adapted 2 = Adapted

3 _10_ _11_ _____ 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

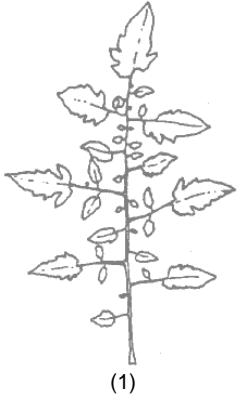
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ILLUSTRATIONS OF TOMATO LEAF AND FRUIT CHARACTERISTICS

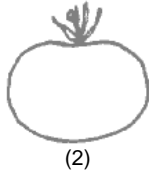
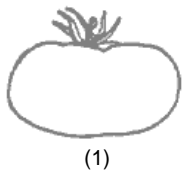
4. LEAF

Morphology:

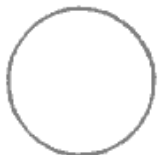


7. FRUIT

Typical fruit shape:



Shape of transverse section:



1 = Round



2 = Flattened



3 = Angular



4 = Irregular

Shape of stem end:



1 = Flat



2 = Indented

Shape of blossom end:



1 = Indented



2 = Flat



3 = Nippled



4 = Tapered

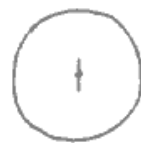
Shape of pistil scar:



1 = Dot



2 = Stellate



3 = Linear



4 = Irregular

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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".
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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE
APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

FOR OFFICIAL USE ONLY

PVPO NUMBER

EXHIBIT E - STATEMENT OF THE BASIS OF OWNERSHIP

1. Name of Owner Enza Zaden Beheer B.V.	2. Temporary Designation or Experimental Name E23.34008	3. Variety Name Avalantino
---	---	--------------------------------------

4. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. YES NO

5. Is the applicant a U.S. national or a U.S. based entity? If no, give name of country. YES NO
The Netherlands

6. Is the applicant the original owner? YES NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
 YES NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
 YES NO If no, give name of country

7. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.