



No.

202000264

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Rutgers, The State University of New Jersey

Whereas, THERE HAS BEEN PRESENTED TO THE

Administrator of the Agricultural Marketing Service

An application requesting a certificate of protection for an alleged novel variety of sexually reproduced, asexually 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 germplasm material 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.)



PEPPER

'Rutgers Rosebell Red'

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 fourth day of June, in the year two thousand and twenty one.*

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Administrator
Agricultural Marketing Service



ST470 - Application for Plant Variety Protection Certificate Application #: 202000264

Owner / Applicant / Organization

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Experimental Name: Hab A
Variety Name: Rutgers Rosebell Red
Crop Kind: Pepper

ST470 Main

1. Genus and Species name of crop

Capsicum chinense Jacq.

2. Family name (Botanical)

Solanaceae

3. Is the variety a first generation hybrid?

No

4. Does the variety contain any Transgenes?

No

5. 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)

No

6. 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?

No

**7. Is the variety or any component of the variety protected by intellectual property right?
(plant breeder's right or patent)**

No

Exhibit A - Origin and Breeding History

1. Genealogy (back to and including public and commercial varieties, lines, or clones used) and the breeding method(s).

'Rutgers Rosebell Red' was developed from a field cross between African and Mexican Habanero peppers, grown and observed between 2010 and 2019. In 2019, 'Rutgers Rosebell Red' was identified as distinct in large fruit size, wall firmness, and attractive fruit aesthetics, exhibiting a rosebell-like shape with smooth, glossy skin and bright red color. This variant also produces a sauce with appealing flavor, consistency, and moderate heat (between 100 and 200K Scoville heat units). The variant begins to flower about 8 weeks after transplanting with the first fruit ripening about 12 weeks after transplanting. The growth of this variant is indeterminate. It continues to flower and fruit until the first frost terminates growth in late October to early November. Ripe fruit durability is >4 weeks and postharvest shelf life for the fruit is 2-3 weeks at room temperature and 3-4 weeks in cold storage (45-50F).

2. Give the details of subsequent stages of selection and multiplication.

3. Is the variety uniform?

Yes

How did you test for uniformity?

Between 2016 and 2019, 'Rutgers Rosebell Red' (HAB-A) was evaluated in the field in central and southern NJ for plant and fruit phenotypic uniformity. Plants and fruit were visually rated in the field on a scale of 1-5, where 1= extreme irregularity and 5= 100% uniform. Irregular variants were eliminated through fruit selection for seed between 2016 and 2017. Uniform plants with uniform fruit were consolidated between 2018 and 2019 in central and southern NJ.

4. Is the variety stable?

Yes

How did you test for stability? Over how many generations?

Stability of 'Rutgers' Rosebell Red' was confirmed over two generations in 2018 and 2019 through replicated trials at HF3 (central NJ) and RAREC (southern NJ) research centers.

5. Are genetic variants observed or expected during reproduction and multiplication?

No

Exhibit A Attached Files List

File Name	Last Modified On
202000265_ExhibitAQuestion2.pdf	5/7/2020 4:37:06 PM

Exhibit B - Statement of Distinctness

1. Based on overall morphology. Applicant's new variety 'Rutgers Rosebell Red'
is most similar to Comparison Variety 'Pumpkin habanero', 'Scotch bonnett habanero',
Jamaican hot pepper

2. Application Variety Traits

The fruit color pre-ripening varies from light to deep green. The ripe fruit is large and red with a thick and firm corrugated wall, rosebell shape, glossy skin, long shelf-life postharvest (rated 4-5 at 4 weeks stored at 45-50F and 4-5 at 3 weeks stored at room temperature (75-85F), where 1 and 5 indicate fruit completely rotted and retains complete integrity, respectively). The heat level ranges from 100-200K Scoville heat units (SHU).

3. Comparison Variety1 Additional Comments?

'Rutgers Rosebell Red' fruit has a better shelf life (rated 4-5 at room temperature, compared with the rating of 3 for the 'Pumpkin habanero'), is red in color (compared with the yellow color of the 'Pumpkin habanero'), has a large size (compared with the medium size of the 'Pumpkin habanero'), and has a moderate heat (> 100K SHU compared with < 50K of the 'Pumpkin habanero').

4. Comparison Variety2 Additional Comments?

'Rutgers Rosebell Red' fruit is red in color (compared with the yellow color of the 'Scotch bonnett habanero'), has a 'rosebell'-like shape (compared with the oblong shape of the 'Scotch bonnett habanero'), has a large size (compared with the medium size of the 'Scotch bonnett habanero'), and has a moderate heat (100K-200K SHU compared with 200K-300K of the 'Scotch bonnett habanero').

5. Comparison Variety3 Additional Comments

'Rutgers Rosebell Red' fruit is red in color, same as the Jamaican hot pepper; has a 'rosebell'-like shape (compared with the relatively round shape for the Jamaican hot pepper), and has a moderate heat (100K-200K SHU compared with 250K-350K SHU for the Jamaican hot pepper). Rutgers Rosebell Red fruit size is large (11-12oz compared with 7-8oz for Jamaican hot pepper)

Exhibit B Attached Files List

File Name

Last Modified On

Exhibit C

Pepper

A . Species

- 1 . Location and Dates of Trials
 1. RAREC, Southern NJ 2010-2011
 2. RAREC & Hort Farm 3 Central NJ 2012-2015
 3. RAREC & Hort Farm 3 Central NJ 2016-2019
- 2 . Species
 - C. chinense

B . Maturity

- 1 . Days From Transplanting Until Mature Green Stage
 - 70
- 2 . Days From Transplanting Until Mature Red or Yellow Stage
 - 80
- 3 . Days From Direct Seeding Until Mature Green Stage
 - 126
- 4 . Days From Direct Seeding Until Mature Red or Yellow Stage
 - 136

C . Plant

- 1 . Plant Habit
 - Other
 - 75-90 cm tall; bushy with bifurcative branching
- 2 . Plant Attitude
 - Other
 - Vibrant
- 3 . Plant Width (cm)
 - 75
- 4 . Length of Stem from Cotyledons to First Flower (cm)
 - 30
- 5 . Length of Third Internode From Soil Surface (mm)
 - 100
- 6 . Basal Branches
 - None
- 7 . Branch Flexibility
 - Rigid
- 8 . Stem Strength
 - Strong

D . Leaves

1 . Petiole Length (mm)

10

2 . Mature Leaf Shape

Lanceolate

3 . Leaf Color

Medium Green

4 . Leaf Color Chart Name

American Standard

5 . Leaf Color Code

56b000

6 . Leaf and Stem Pubescence

Absent

7 . Margin Undulation

Absent

8 . Blistering

Absent

E . Flowers

1 . Number of Flowers per Leaf Axil

1

2 . Number of Calyx Lobes

5

3 . Number of Petals

5

4 . Corolla Color

White

5 . Corolla Throat Markings

Other

none

6 . Anther Color

Other

White bound by dark brown/black lining; may also be dark brown, black bound by white lining

7 . Style Length

Same as Stamen

8 . Self-Incompatibility

Present

F . Fruit

1 . Group

Other

Habenero

2 . Immature Fruit Color

Other

deep green or whitish green

3 . Immature Color Chart Name

unknown

4 . Code

unknown

5 . Mature Fruit Color

Other

Red

6 . Mature Color Chart Name

unknown

7 . Mature Fruit Color Code

unknown

8 . Pungency

Hot

9 . Capsaicin per gram Dry Fruit (mg)

10

10 . Scoville Units Dry Fruit

100K-200K

11 . Flavor

Moderate Pepper Flavor

12 . Fruit Glossiness

Shiny

13 . Surface Smoothness

Smooth

14 . Fruit Position

Pendent

15 . Calyx Shape

Saucer-Shaped (Flat, Non-Enveloping)

16 . Calyx Diameter (mm)

3

17 . Fruit Length (mm)

30

18 . Fruit Diameter at Calyx Attachment (mm)

3

19 . Fruit Diameter at Mid-Point (mm)

20

20 . Flesh Thickness at Mid-Point (mm)

3

21 . Average Number of Fruits per Plant

82

22 . Percentage of Large Fruits

70

23 . Weight Range of Large Fruits

Range From

15 gm

Range To

22 gm

24 . Percentage of Medium Fruits

10

25 . Weight Range (Medium Fruits)

From

10 gm

To

14 gm

26 . % Small Fruits

5

27 . Weight Range (Small Fruits)

From

To

10 gm

28 . Average Fruit Weight (gm)

20.5

- 29 . Fruit Base Shape
Rounded
- 30 . Fruit Apex Shape
Pointed
- 31 . Fruit Shape
Bell
- 32 . Fruit Shape at Longitudinal Section
Other (Specify)
Bell Shaped.,Bell Shaped.
- 33 . Fruit Shape at Cross Section and at Level of Placenta
Circular
Bell Shaped.,Bell Shaped.
- 34 . Fruit Set
Scattered
- 35 . Interloculary Grooves
Medium
- 36 . Percentage of Fruits with One Locule
5
- 37 . Percentage of Fruits with Two Locules
10
- 38 . Percentage of Fruits with Three Locules
70
- 39 . Percentage of Fruits with Four Locules
5
- 40 . Percentage of Fruits with Five or more Locules
0
- 41 . Average Number of Locules
3
- 42 . Pedicel Length (mm)
20
- 43 . Pedicel Thickness (mm)
2
- 44 . Pedicel Shape
Straight
- 45 . Pedicel Cavity
Absent
- 46 . Depth of Pedicel Cavity (mm)

0

G . Seed

1 . Seed Cavity Length (mm)

2 . Seed Cavity Diameter (mm)

3 . Placenta Length (mm)

20

4 . Number of Seeds per Fruit

35

5 . grams per 1000 Seeds

4

6 . Seed Color

Yellow

H . Anthocyanin

1 . Seedling Hypocotyl

Absent

2 . Stem

Moderate

3 . Node

Moderate

4 . Leaf

Moderate

5 . Pedicel

Absent

6 . Calyx

Absent

7 . Fruit

Moderate

I . Virus, Disease, and Insect Resistance

I. Virus Resistance

1 . Pepper - Cucumber Mosaic Virus

none observed

Race or Strain

2 . Curly Top Virus

none observed

Race or Strain

3 . Pepper Mottle Virus

none observed

Race or Strain

4 . Potato Y Virus

none observed

Race or Strain

5 . Tobacco Etch Virus

none observed

Race or Strain

6 . Tobacco Mosaic Virus

none observed

Race or Strain

II. Disease and Insect Resistance

1 . Anthracnose (Gloeosporium piperatum)

none observed

Race or strain

2 . Bacterial Spot (Xanthomonas vesicatoria)

none observed

Race or Strain

3 . Cercospora Leaf Spot (Cercospora capsici)

none observed

Race or Strain

4 . Nematode (Meloidogyne incognita acrita)

none observed

Race or Strain

5 . Phytophthora Root Rot (Phytophthora capsici)

none observed

Race or Strain

6 . Ripe Rot (Vermicularia capsici)

none observed

Race or Strain

7 . Southern Blight (Sclerotium rolfsii)

none observed

Race or Strain

8 . Verticillium Wilt (Verticillium dahliae)

none observed

Race or Strain

J . Pepper Comments

1 . Comments

'Rutgers Rosebell Red' is a healthy plant in the field. Since 2010, it has been free from common or rare diseases or nematodes. In the greenhouse or growth chamber, plant is susceptible to thrips and aphid attack. Thrips attack the flowers and prevent fruiting, while aphids feed on the young growing points and inhibit plant growth. Available synthetic and bio-insecticides for thrips and aphid control were used to manage these insects.

Exhibit D - Additional Descriptive Information

Additional descriptive question / text:

photo of leaf

Additional descriptive answer / information in detail:

see photo

Additional descriptive question / text:

Anthocyanin expression

Additional descriptive answer / information in detail:

Anthocyanin expression in the plant foliage and fruit is pronounced under cool temperature (<70F) in the field and greenhouse/growth chamber but less so under warm temperature (>80F)

Exhibit D Attached Files List

File Name

202000265_ExhibitD.pdf

Last Modified On

5/8/2020 7:33:14 AM

Exhibit E - Statement of the Basis of Ownership

1. Does the applicant own all rights to the variety?

Yes

2. Is the applicant a U.S. national or a U.S. based entity?

Yes

3. Is the applicant the original owner?

Yes

4. Additional explanation on ownership (Trace ownership from original breeder to current owner):

'Rutgers Rosebell Red' was developed at the facilities of the Rutgers Agriculture Research and Extension Center, Bridgeton, Southern NJ, and Rutgers Horticulture Farm 3, East Brunswick, Central NJ, between 2011 and 2019, by Albert Ayeni, Ph.D., Tom Orton, Ph.D., and James Simon Ph.D.

PLEASE NOTE:

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

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.

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.

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.