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(54) **STRAWBERRY PLANT NAMED ‘NCS 10-038’**

(50) Latin Name: *Fragaria x ananassa* Duchense
Varietal Denomination: **NCS 10-038**

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See application file for complete search history.

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(57) **ABSTRACT**

A new and distinct variety of commercial strawberry plant
(*Fragaria x ananassa* Duchense) named ‘NCS 10-038’
substantially as illustrated and described, characterized by
its very high yields, mid-season (peak harvest weeks 15-18)
fruit ripening with the fruit having a medium size, good
flavor, conical to wedge shape, and being of a good quality
with very good flesh firmness and good skin toughness.
‘NCS 10-038’ has fair to good firmness and is suitable for
pick your own and local sales.

3 Drawing Sheets

Latin name of the genus and species: The Latin name of
the novel strawberry plant disclosed herein is *Fragaria x*
ananassa Duchense.

Variety denomination: The inventive strawberry variety
has been given the variety denomination ‘NCS 10-038.’

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct variety
of strawberry (*Fragaria x ananassa* Duchense) named ‘NCS
10-038’. This strawberry plant (genotype) originated in a
strawberry breeding plot in Salisbury, N.C. The genotype
was collected from open pollinated fruit from the seed
parent ‘NCH 08-07’. The seed parent is an unreleased
breeding selection with med large size, high fruit quality and
good appearance. The seeds collected from the female
parent in the spring of 2009 were germinated in the summer
and planted in the fall of 2009. The selection was made in
the spring of 2010. ‘NCS 10-038’ was first asexually propa-

gated at the Piedmont Research Station, Salisbury N.C.,
Rowan County, in 2011. Ten daughter plants were propa-
gated from runner tips originating from the mother plant and
transplanted to second test trials where they were compared
to several other genotypes in 2011. Plants were propagated
in subsequent years and were established in replicated trials
in 2012-17. ‘NCS 10-038’ exhibited very high yields
through the season in trials in multiple locations and years.
Propagules of ‘NCS 10-038’ in all trials have been identical
to the initial daughter plants. The combination of traits
disclosed herein that characterize ‘NCS 10-038’ have been
retained true to type through successive cycles of asexual
propagation.

SUMMARY OF THE INVENTION

‘NCS 10-038’ when grown in the piedmont regions of
North Carolina has produced consistently high yields
(Tables 1 and 2). Yields are typically 130-150% higher than

'Chandler', the current standard cultivar grown in North Carolina. At the Central Crops Research Station, in Clayton N.C., flowering occurred in 2016 in weeks 10-16. Peak ripe fruit yield occurred in weeks 15-18. The new and distinct variety of strawberry *Fragaria x ananassa* Duchense 'NCS 10-038' has the following unique combination of desirable features that are outstanding in a new variety including (1) very high yield, (2) long season of harvest for spring crop, (3) semi-firm fruit, and (4) adapted to the southeastern US. 'NCS 10-038' is suitable for pick your own and local sales.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying photographs show typical specimens of 'NCS10-038'. The photographs were taken in Clayton, N.C.

FIG. 1 shows whole 8-month old plants of 'NCS 10-038' including leaves, inflorescences and fruit at varying stages of ripeness.

FIG. 2 shows a close up of a single 8 month old plant of 'NCS 10-038' showing leaves, inflorescences and fruit at varying stages of ripeness.

FIG. 3 shows a close-up of fruit of 'NCS 10-038', sliced and whole. The designation of "038" in FIG. 3 is an abbreviation for the claimed plant, 'NCS 10-038'.

DETAILED BOTANICAL DESCRIPTION

The following is a detailed description of a new distinct strawberry variety known as 'NCS 10-038'. The description is based on observations taken from the 2014-2017 growing seasons in the two piedmont locations of Clayton and Salisbury, N.C. Each year the plants are set in the fall and fruiting occurs in the following spring. This description is in accordance with International Union for the Protection of New Varieties of Plants (UPOV) terminology. Color designations and descriptions and other phenotypical traits may deviate from the stated values depending on location and season as this genotype has not been observed in all environmental conditions. Color terminologies are based on The Royal Horticultural Society Colour Chart, London (R.H.S.) (5th Edition. 2007).

Plant:

Average height.—29.3 cm.

Average width.—19 cm.

Canopy density.—Moderate.

Growth habit.—Semi erect to erect.

Number of crowns/plant.—5-13.

At peak production, the plant will have multiple crowns. Each crown will produce one truss and each truss will have several fruit.

Vigor.—Moderate.

Leaf:

Overall.—Pinnately compound with 3 leaflets.

Mean length including petiole.—301 mm.

Mean width.—178 mm.

Terminal leaflet:

Upper leaf surface color.—137B.

Lower leaf surface color.—138B.

Terminal leaflet length.—87 mm.

Terminal leaflet width.—88 mm.

Length to width ratio.—0.99.

Shape in cross section.—Concave.

Leaflet shape.—Obovate.

Terminal leaflet serration number.—18.

Terminal leaflet margin profile.—Obtuse.

Terminal leaflet shape of base.—Acute cuneate.

Terminal leaflet shape of serrations.—Pointed.

Interveinal blistering.—Moderate.

Pubescence density of leaves, lower surface.—Sparse.

Leaf glossiness.—Semi-glossy.

Venation pattern.—Pinnate.

Petiole.—Petiole length — 23.1 mm. Petiole diameter — 2.3 mm. Pubescence density of petiole — Moderate. Petiole pose of hairs — Perpendicular. Petiole color — 144C. Anthocyanin — Present.

Petiolule.—Length — terminal 3.5 mm, lateral 2.0 mm, diameter 1.2 mm. Color — 144C.

Stipule.—Stipule length — 28.0 mm. Stipule width — 8.5 mm. Stipule color — 145B. Stipule pubescence — Yes. Anthocyanin — No. Bract pair or single — Mostly single, occasionally paired.

Secondary leaflets:

Color upper surface.—137B.

Color lower surface.—138B.

Secondary leaflet length.—85 mm.

Secondary leaflet width.—86 mm.

Length to width ratio.—0.98.

Shape in cross section.—Concave.

Leaflet shape.—Obovate.

Secondary leaflet margin profile.—Obtuse.

Secondary leaflet shape of base.—Oblique.

Secondary leaflet shape of serrations.—Pointed.

Pubescence density.—Leaves, lower surface — Sparse.

Number of leaflet serrations.—17.

Leaf glossiness.—Semi-gloss.

Texture.—Moderately smooth.

Venation pattern.—Pinnate.

Stolons:

Number of daughter plants.—25-40 depending on environmental conditions.

Anthocyanin.—Variable, absent to moderate.

Thickness.—3 mm.

Pubescence.—Very sparse nearly glabrous.

Inflorescence:

Time of flowering.—Short day flowering habit.

Position relative to canopy.—At or below canopy.

Branching of the inflorescence.—At or close to crown.

Number of flowers/inflorescence.—6.

Relative flower size.—Medium.

Relative calyx size to corolla.—< to =.

Inflorescence attitude at harvest.—Mostly decumbent.

Inflorescence length.—20 cm.

Flower diameter.—39.4 mm.

Calyx diameter.—40 mm.

Blossom longevity.—1-2 days.

Number of stamens.—Average of 30.

Anther color.—13A to 16A.

Filament color.—150C.

Style color.—150A.

Stigma color.—2D.

Petals.—Petal length — 14.9 mm. Petal width — 14.5 mm. Petal size ratio — 1.02. Petals/flower — 5. Petal color — 155D. Corolla diameter — 40 mm. Flower shape — Orbicular. Number flowers/inflorescence — 3-6. Petal spacing — Even to overlapping.

Sepals.—Sepal number — 11. Sepal color — 137A.

Sepal length.—16.2 mm. *Sepal width.*—7.85 mm.

Sepal attitude.—outward, some upward.

Calyx.—Calyx color — 137A. Corolla diameter — 39.3 mm. Calyx size compared to fruit — > or =. Calyx attachment — level.

Pedicels.—Pedicel Color — 145A. Pubescence — low. Mean length of the pedicel attached to the primary fruit — 55 mm.

Fruit:

Fruit fragrance.—Moderate.

Flavor.—Moderate flavor.

Fruit skin color.—53A.

Fruit flesh color.—47A.

Evenness of color.—Outside skin even, inside from 47A in the apex to NN155C in the center near the calyx.

Flesh and skin firmness at full ripe stage.—Moderately firm (See Table 3).

Rain damage.—Minimal.

Fruit size average.—16.4-17.5 g.

Fruit shape.—Conical to slight wedge.

Fruit length.—41.1 mm.

Fruit width.—34.8 mm.

Fruit length to width ratio.—1.18.

Fruit skin glossiness.—Glossy.

Fruit calyx orientation.—Flat to slight rise.

Band without achenes.—None.

Center cavity size.—None or very small 2-3 mm.

Unevenness of surface.—Even.

Disease resistance.—Susceptible to grey mold (*Botrytis cinerea*) and anthracnose fruit rot (*Colletotrichum acutatum*).

Seeds:

Achene color.—151A to 53A, achene color individually present depending on location on the fruit.

Achene attachment.—Even with surface.

Achene shape.—Oval.

Preferred planting date is about 25 September in Salisbury, N.C. and October 5 in Clayton, N.C. Nursery performance has been fair in western NC locations due to moderate production of many runners that produce multiple daughter plants that root easily.

The technical (pomological) descriptive data comparing yield of ‘NCS 10-038’ to that of ‘Sweet Charlie’ (U.S. Plant Pat. No. 8,729), ‘Camarosa’ (U.S. Plant Pat. No. 8,708) and ‘Chandler’ (U.S. Plant Pat. No. 5,262) in Salisbury, N.C. and in Clayton, N.C. is presented in Tables 1-2. The post-harvest storage life attributes comparing ‘NCS 10-038’ to ‘Camarosa’ and ‘Chandler’ as well as ‘NCS10-156’ are presented in Tables 3-4. This data was previously published in part in Perkins-Veazie, P., J. Pattison, G. E. Fernandez and G. Ma. 2016. Fruit Quality and Composition of Two Advanced North Carolina Strawberry Selections. *Intl. J. Fruit Science*. 16:(Sup 1): 220-227).

TABLE 1

Piedmont Research Station, Salisbury NC. 2015-16 Total yield, marketable yield, percent marketable yield and average berry weight.				
Genotype	Total Yield (g/plant)	Total Yield (lbs/A)	Marketable Yield (g/plant)	Marketable Yield (lbs/A)
NCS 10-038	931	35749	771	29605
NCS 10-156*	697	26757	586	22484
Camarosa	637	24431	550	21107

TABLE 1-continued

Piedmont Research Station, Salisbury NC. 2015-16 Total yield, marketable yield, percent marketable yield and average berry weight.				
Genotype	Total Yield (g/plant)	Total Yield (lbs/A)	Marketable Yield (g/plant)	Marketable Yield (lbs/A)
Chandler	665	25505	505	19389
Sweet Charlie	488	18712	406	15592

Genotype	Percentage Marketable Yield (% of total)	Marketable Percent of Chandler	Average Berry weight (g)
NCS 10-038	82.8	153	16.4
NCS 10-156*	84.0	116	18.9
Camarosa	86.4	109	21.7
Chandler	76.0	100	16.9
Sweet Charlie	83.3	80	17.3

*NCS 10-156' is co-pending Plant Pat. Application No. 16/602,017

TABLE 2

Central Crops Research Station, Clayton, NC 2015-16 Total yield, marketable yield, percent marketable yield and average berry weight.				
Genotype	Total Yield (g/plant)	Total Yield (lbs/A)	Marketable Yield (g/plant)	Marketable Yield (lbs/A)
NCS 10-038	785	30131	712	27309
Camarosa	668	25619	607	23290
Chandler	669	25690	539	20698
NCS 10-156*	558	21400	485	18603
Sweet Charlie	337	12941	306	11725

Genotype	Percentage Marketable Yield (% of total)	Marketable Percent of Chandler	Average Berry weight (g)
NCS 10-038	90.6	132	17.5
Camarosa	90.9	113	18.2
Chandler	80.6	100	19.8
NCS 10-156*	86.9	90	14.6
Sweet Charlie	90.6	57	14.2

*NCS 10-156' is co-pending Plant Pat. Application No. 16/602,017

TABLE 3

Subjective ratings of strawberry fruit held at 4 C for 8 days averaged for 2014 and 2015 seasons ^z .							
Selection	Overall appearance ^y	Fruit shrivel	Fruit darkness	Calyx brown	Calyx shrivel	Fruit firmness	Berries with mold (%)
Camarosa	3.8a	3.9ab	3.7bc	3.8a	3.6a	4.3a	3.1a
Chandler	4.0a	4.3a	3.8b	3.9a	3.8a	3.2b	4.6ab
NCS 10-038	4.0a	4.4a	4.2a	3.4a	3.6a	3.8b	6.1ab
NCS 10-156	3.3b	3.3b	3.2c	3.0b	3.0a	2.2c	12.3b

^zAll fruit quality attributes were given subjective ratings of 1 to 5 where a higher number indicates better fruit quality. Berries with mold was determined by 100% × (no. berries with mold/total no. berries).

^yMeans within column with same letter indicate no significant difference using Tukey's HSD, p < 0.05.

TABLE 4

Fruit composition of fully ripe freshly harvested strawberry selections grown in Salisbury, NC in 2014 and 2015 ^z .						
Selection	SSC (%)	pH	Titratable acidity (TA) (% as citric acid)	SSC/TA	Total antho-cyanin (mg P3G/100 g fwt) ^y	Total phenolic content (mg GA/100 g)
Day 0						
Camarosa	7.1b	3.82a	0.69b	10.6ab	41.27a	155.62a
Chandler	6.8b	3.71b	0.69b	10.0ab	48.55a	157.57a
NCS 10-038	7.1b	3.67b	0.75a	9.8b	28.87b	142.05b
NCS 10-156	7.8a	3.78a	0.72ab	11.0a	33.95ab	152.23a
Day 8						
Camarosa	7.6b	3.97a	0.64b	12.1a	51.52a	152.16bc
Chandler	7.6b	3.87b	0.66b	11.6a	45.39ab	158.50a

TABLE 4-continued

Fruit composition of fully ripe freshly harvested strawberry selections grown in Salisbury, NC in 2014 and 2015 ^z .						
Selection	SSC (%)	pH	Titratable acidity (TA) (% as citric acid)	SSC/TA	Total antho-cyanin (mg P3G/100 g fwt) ^y	Total phenolic content (mg GA/100 g)
NCS 10-038	6.9c	3.81b	0.68b	10.2b	29.86c	147.59c
NCS 10-156	8.7a	3.87b	0.77a	11.6a	37.04b	153.21b

^zEach selection consists of a mean of 3 to 7 samples, representing 3 harvest dates per year. Means within column with same letter indicate no significant difference using Tukey's HSD, p < 0.05.

^yP3G and GA are pelargonidin 3-glucoside and gallic acid equivalents, respectively.

That which is claimed is:

1. A new and distinct variety of *Fragaria x ananassa* Duch. plant named 'NCS 10-038', substantially as described and illustrated herein.

* * * * *

Fig. 1



Fig. 2



Fig. 3

