No. 8200113

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

New Mexico Crop Improvement Association, Inc.

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 APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTOANNEXEDANDMADEAPART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEES COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PKOTECTION 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 SUCCESSOKS, 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, OR 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. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS PART OF CERTIFIED SEEV AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS REQUIRED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

STRAWBERRY CLOVER

'Fresa'

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* 26th *day of* November *in the year of our Lord one thousand nine hundred and* eighty-two

Attest:
Kenneth H. Evans
Acting
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R Block
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0005

lo certificate for plant variety protection ıay be issued unless a completed application form has been received (5 U.S.C. 53).

1. NAME OF APPLICANT(S)
New Mexico Crop Improvement Association, Inc.

2. TEMPORARY DESIGNATION
NMSC-1

3. VARIETY NAME
Fresa

4. ADDRESS (Street and Mo. or R.F.D. No., City, State, and Zip Code)
Box 3CI N. M. S. U.
Las Cruces, New Mexico 88003

6. PHONE (Include area code)
(505) 646-4125

FOR OFFICIAL USE ONLY
PVPO NUMBER
8200113

6. GENUS AND SPECIES NAME
Trifolium fragiferum

7. FAMILY NAME (Botanical)
Leguminosae

FILING DATE
4/30/82
TIME
12:30 ☐ A.M. ☒ P.M.

8. KIND NAME
Strawberry clover

9. DATE OF DETERMINATION
9/22/81

FEES RECEIVED
AMOUNT FOR FILING
$ 500.00
DATE
4/30/82
AMOUNT FOR CERTIFICATE
$ 250.00
DATE
9/27/82

lo. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.)
Association, Inc.

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
New Mexico

12. DATE OF INCORPORATION
August 27, 1947

13. NAME AND ADDRESS OF APPLICANT REPRESENATIVE(S), IF ANY, TO SERVE IN THIS APPLIC TION AND RECEIVE ALL PAPERS
New Mexico Crop Improvement Association, Inc.
Box 3CI N. M. S. U.
Las Cruces, New Mexico 88003

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENTSUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*

b. ☐ Exhibit B, Novelty Statement

c. ☒ Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*

d. ☐ Exhibit D, Additional Description of the Variety

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)* c l No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ Yes c l No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ Foundation ☒ Registered E l Certified

18. DID THE APPLICANT(S) FILE FOR PROTECTION OF THE VARIETY IN THE U.S. OR OTHER COUNTRIES7
☐ Yes *(If "Yes," give names of countries and da tes)*
☒ No

19. HAVE RIGHTS BEEN GRANTED IN THE U.S. OR OTHER COUNTRIES?
☐ Yes *(If "Yes," give names of countries and dates/*
☒ No

20. The applicant(s) declare(s) 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
J. L. Perkins
DATE
4/27/82

SIGNATURE OF APPLICANT
Robert E. Oyler
DATE
4/22/82

FORM LMGS-470 (9-81) (Edition of 1-78 is obsolete)

INSTRUCTIONS

General: Send an original copy of the application and exhibits, at least 2,500 viable seeds, and $500 fee (*$250 filing fee and $250 examination fee*) to U.S. Department of Agriculture, Agricultural Marketing Service, Livestock, Meat, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland *20705. (See section 180.175 of the Regulations and Rules of Practice.)* Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

Item

9 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41 (a) of the Act and (2) the date a decision was made to increase the seed.

14a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.

14b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

14c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.

14d Describe any additional characteristics that are not described, or whose description cannot be accurately. conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc;

15 If "Yes" is specified *(seed of this variety be sold by variety name only as a class of certified seed)* the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "No," he may change his choice. *(See section 180.16 of the Regulations and Rules of Practice.)*

16 See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

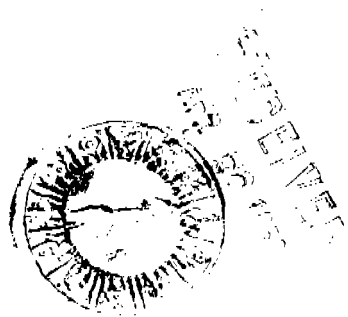


EXHIBIT "A"

BREEDING HISTORY OF FRESA STRAWBERRY CLOVER

"Fresa" strawberry clover, Trifolium fragiferum L, was released in 1981 by the Agronomy Department and the Agricultural Experiment Station of New Mexico State University. Fresa is a population of selected plants from an introduction from Turkey (P.I. #204521). It is a low growing perennial legume that spreads vegetatively by stolons. The flowers are predominately pink with an occasional plant exhibiting white blossoms. The flower heads are dense, globose and borne on long penducles. The seed grades from yellow to brown and, in size, is similar to or slightly larger than white clover.

Fresa is the result of two cycles of mass selection primarily for low dense growth. It is lower growing than other strawberry clover cultivars tested in New Mexico. The primary breeding objective was to develop a cultivar suitable for relatively low maintenance, as a home ground cover or possibly as a ground cover in the orchards.

Fresa is very uniform and stable. 90% of the population of successive generations exhibit traits as described in exhibit C. Varients in the population are growth habit and leaf morphology, all at a low frequency so that the total does not exceed 10%. Variability in strawberry clover may be attributed to the partially cross-pollinated nature of the species, bringing recessive traits to expression. Non-typical plants produce progeny typical of the variety. Fresa is uniform for the attribute selected for i.e. plant height. Taller plants should be considered out crosses or contaminants.

14 b. Exhibit "B"

NOVELTY STATEMENT

'Fresa' most closely resembles 'O'Connor's' and 'Palestine'; however, 'Fresa' is shorter growing.. Exhibit "C" and the addendum to exhibit "D" display a mean plant height of 14 cm for Fresa and heights of 27, 24 and 22 cm for Salina, O'Connor's and Palestine, respectively. Fresa's mean height is from 8 to 13 cm shorter than the check varieties. Also clipping wet weights averaged 32.9 grams for 'Fresa' vs. 206.7 grams for 'Palestine' and 279.5 grams for 'O'Connor's'. Average weights of two clippings from four replications of 10.5 square foot plots. (See table 1 and Table 2 of the variety release notice.) Although the traits height and clipping weight are compound in nature the height trait has been tested extensively and the results are very consistent. The clipping weights of Fresa display over a six-fold decrease from the closest variety,

DRAFT

GRAIN AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

-Exhibit C-

OBJECTIVE DESCRIPTION OF VARIETY
STRAWBERRY CLOVER
(TRIFOLIUM Fragiferum)

Place the appropriate number that describes the varietal character of this variety in the boxes below. Fill unused columns with zeroes (e.g. 099 when number is 99). Incomparisons to standard varieties, the value e 000 should only be used to indicate that the varieties are equal. The symbol ▲ indicates a decimal point. Characteristics described, including numerical measurements, should represent those which are *typical* for the variety. Measured data should be for *spaced plants*. Any recognized color fan, e.g. Royal Horticultural Colour Chart, may be used to determine plant colors; designate system used: visual. Give location of test area Las Cruces, NM. Ranges of values are valuable and may be included with additional description elsewhere in the application.

--NOTE: For single plant data a minimum of 100 plants is suggested.

1. TYPE:
[1] 1=Small 2=Intermediate 3=Large 4=Other (specify)

STANDARD VARIETIES
none 1= S-1 2= 3= 4=

2. MATURITY:
[095] % Plants flowering in seedling year if planted in spring

Time of flowering (50% of plants in bloom): (from spring growth in non-seedli Year)
June 15
[ ] Days earlier than [ ] standard variety
[ ] Days later than [ ] standard vaxiety

3. GROWTH HABIT:
B 1=Prostrate ( ) 2=Erect ( )
D 1=Lax ( ) 2=Dense ( )

Plant Height (from soil level to top of flowering head at 50% flowering):
[14] cm tall
[ ] cm shorter than [ ] standard variety
[ ] cm taller than H standard variety

Plant Width (average of 2 horizontal measurements of leaf spread at top of plant at 50% flowering of 2nd year):
[47] cm Wide
[ ] cm narrower than ❑ standard variety
[ ] cm wider than [ ] standard variety

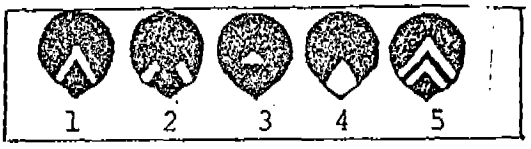
4. LEAF (Central leaflet of 3rd leaf from tip of rapidly growing stolon - usually in summer months): April
N/A [ ] plants cyanophoric (Picric Acid Test)
[12] nun leaflet width
9 ↔ 15
[19] mm leaflet length
15 ↔ 25
[14] mm petiole width
1.2 ↔ 1.7
[45] mm length pctiole
34 ↔ 54

[ ] mm narrower than ❑ standard variety
[ ] mm wider than [ ] standard variety
[ ] mm shorter than [ ] standard variety
[ ] mm longer than [ ] standard variety
[ ] mm narrower than [ ] standard variety
[ ] mm wider than [ ] standard variety
[ ] mm shorter than [ ] standard variety
[ ] mm longer than [ ] standard variety

El Color: 1=Light green (Regal) 2=Medium green (Merit)
3=Dark green (s-184) 4=Other (specify)

WHITE LEAF MARKING (at 50% flowering): Note categories below allow for increasingly detailed description of the same data. Diagram illustrates terms:

1=Full V 2=Broken V 3=V-point
N/A 4=Filled V 5=Double V



Presence of mark: of total plants,give percentage of marked and unmarked plants (total=100%)

N/A [ ] % Absent [ ] % Marked

shape of mark: of total plants, give percentage having each shape (Total= % marked above).

N/A [ ] % Full v [ ] % Broken V [ ] % V-point
[ ] % Filled V [ ] % Double V [ ] % Other (specify) _____

Om

ANTHOCYANIC (Red) LEAF MARKING (Some leaves of plants examined should have developed at temperatures of 10° C or less): of total plants give percentage marked (red flecking, red midrib, or red leaf) and unmarked (Total = 100%)

N/A [ ] % Absent [ ] % Marked

5. STOLON: Give widest diameter of stolon at point of attachment of leaf measured above (3rd node from tip)

3 4 mm diameter
2.4 <-> 4.1

[ ] mm narrower than [ ] standard variety
[ ] mm wider than [ ] standard variety

6. FLOWERING HEAD (at 50% flowering of variety):

1 2 heads/plant
10-15

[ ] no. greater than [ ] standard variety
[ ] no. fewer than [ ] standard variety

7. DISEASE AND PEST RESISTANCE: (O=not tested, 1=susceptible, and 2=resistant). If variety is claimed to be resistant or to show intermediate reaction, substantiating test scores should be attached clearly identifying disease, application variety, check varieties, location of test, and range and direction of test scores.

A. STOLON AND ROOT ROTS
- o Fusarium spp
- o Rhizoctonia spp
- o Colletotrichum spp
- o Leafodiscus spp
- o Cervularia spp
- o Sclerotium rolfsii
- o Sclerotinia tritoliorium
- [ ]

B. VIRUSES
- o Alfalfa mosaic
- o White clover mosaic
- o Clover yellow mosaic
- o Clover yellow vein mosaic
- o Red clover vein mosaic
- o Peanut stunt
- [ ] Other (specify) _____

C. NEMATODES
- o Root knot
- o Sting
- o Meadow
- o Clover cyst

D. INSECTS
- o Lygus bugs (Lygus spp)
- o Spider mites (Tetranychus spp)
- o Clover seed weevil (Miccotrogus picirostris)
- o Ladino clover seed midge (Dasineura gentneri)
- o Clover head weevil (Hypera meles)
- o Clover leaf weevil (H. punctata)
- o Lesser clover leaf weevil (H. nigrirostris)
- o Alfalfa, weevil (H. postica)
- o Meadow spittlebugs (Philaenus spumarius)
- o Clover root curculio (Sitonia hispidula)
- o Potato leafhopper (Empoasca fabae)
- 1 Other (specify) clover mites (Bryobia [illegible] t i o s a)

a.

Indicate the variety most closely resembling the application variety for the following:

CHARACTER	VARIETY	CHARACTER	VARIETY
Leaflet shape	Salina	Seed color	Palestine
Cutting recovery	Palestine	Late season growth	O'Connor's
Winter hardiness	Palestine	Persistence	unknown

Brewbaker, J. L. and H. L. Carnahan. 1956. Leaf marking alleles in white clover. Uniform nomenclature. Journ. Heredity 47:103-104.

N/A Hawkins, R. P. 1959. Botanical characters for the classification and identification of varieties of white clover. J. Nat. Inst. Agr. Bot. 8: 675-682.

I.S.T.A. (Herhags) Variety Committee, 1972. Draft paper on tests for identification and trueness to cultivar. Proc. Int. Seed Test. Assoc. 37:443-495.

Hollowell, E. A. 1939. Strawberry Clover, USDA Leaflet 176.

Exhibit "D"

NEW MEXICO STATE UNIVERSITY

AGRICULTURAL EXPERIMENT STATION

Las Cruces, New Mexico

Notice of the naming and release of "Fresa" Strawberry Clover, Trifolium fragiferum L.

The Agronomy Department and Agricultural Experiment Station of New Mexico State University announces the naming and release of Fresa strawberry clover.

Fresa strawberry clover, tested under the experimental designation of NMSC-1, is a population of selected plants from Plant Introduction 204521 originally from Turkey. The breeding procedure involved two cycles of mass selection primarily for low, dense growth. Selection and progeny evaluations were made by A. A. Baltensperger, C. E. Watson, Mark Smith, Scott McLean and Roch Gaussoin.

Strawberry clover, as a species, is a low growing perennial legume spreading vegetatively by stolons. The leaves, stems and habit of growth are similar to white clover, however the characteristic white leaf marking is generally absent on strawberry clover. Hollowell (1) describes the flowers of strawberry clover as mostly pink to white resembling a strawberry. The flower heads are dense, globose and born on long peduncles. The seed is larger than white clover and grades from yellow to brown.

Strawberry clover is adapted to the Western States (1) and as a species has shown tolerance to moderately saline soil conditions (1, 2).

It is reported to withstand a wide range of temperatures and soil moisture conditions, including flooding. It has been reported to withstand short drought periods (1).

Fresa has a lower plant height than three other strawberry clover cultivars tested and is considerably lower growing than white clover (Table 1). It also has a lower clipping yield and, therefore, can be clipped infrequently and still maintain a satisfactory ground cover (Table 2). Color, seedhead production and uniformity are shown in Table 2 for NMSC-1 and four other clovers. Fresa is slower to establish a complete cover than the other strawberry clover cultivars tested. Flowers of Fresa are predominantly pink or strawberry colored with occasional white blossoms.

Fresa is susceptible *to* the clover *mites* (Bryobia praetiosa) and damage has been noted in lush seed increase plots at the Plant Science Research Center near Las Cruces.

Fresa, a nitrogen fixing legume, is being released for use in the Southwest as a ground cover where there is little expected traffic, where little or no applied nitrogen is used, and where infrequent mowing is desired. It may also find use as a ground cover in newly-established orchards in the Southwest.

Generations of seed increase will be breeders, foundation, registered and certified. Breeders' seed will be maintained by the New Mexico Agricultural Experiment Station. Foundation, registered and certified seed will be grown under the supervision of the New Mexico Crop Improvement Association which will distribute seed for increase. Approximately 2 pounds of breeders' seed is now available for distribution in 1982.

Table 1. Mean plant height (in.) of NMSC-1 and three other cultivars of Strawberry clover measured in fall of 1979, six months after seeding; spring 1980, one year after seeding; and second test with white clover in summer 1981 at Plant Science Research Center, Las Cruces, New Mexico.

Entry	Fall 1979	Spring 1980	Summer 1981
NMSC-1	3.0a	3.5a	3.0a
Palestine	4.8b	4.5ab	4.2b
O'Connor's	3.5ab	4.3ab	5.9c
Salina	7.0c	5.3b	6.0c
White Clover			7.2d

Values followed by different letters are significantly different at the 5% level.

Table 2. Mean wet weights (g), color score (1 least - 9 most green) and seedhead score (1 least - 9 most) of NMSC-1 and four other clovers from data collected summer 1981 at Plant Science Research Center, Las Cruces, New Mexico.

Entry	Wet Weights	Color Score	Seedhead Score
NMSC-1	32.9a	6.8a	7.5d
Palestine	206.7b	6.0a	4.8b
O'Connor's	279.5c	6.6a	5.5bc
Salina	374.7d	8.1b	6.0c
White Clover	438.3e	6.0a	3.0a

Values followed by different letters are significantly different at the 5X level.

Literature Cited

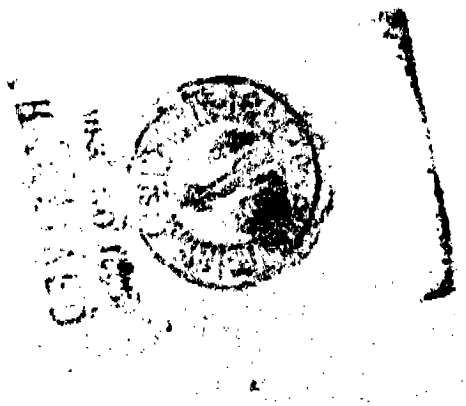
1. Hollowell, E. A,' 1939. Strawberry clover, USDA Leaflet 176.

2. Larson, Carl. A. 1938. The adaptability of strawberry clover to saline soils, State College -of Washington, Agr. Exp. Sta. Bull. 353.

Director, New Mexico Agricultural Experiment Station and Chairman, Varietal Release Committee — Date 11-11-81

Head, Department of Agronomy — Date 10-8-81

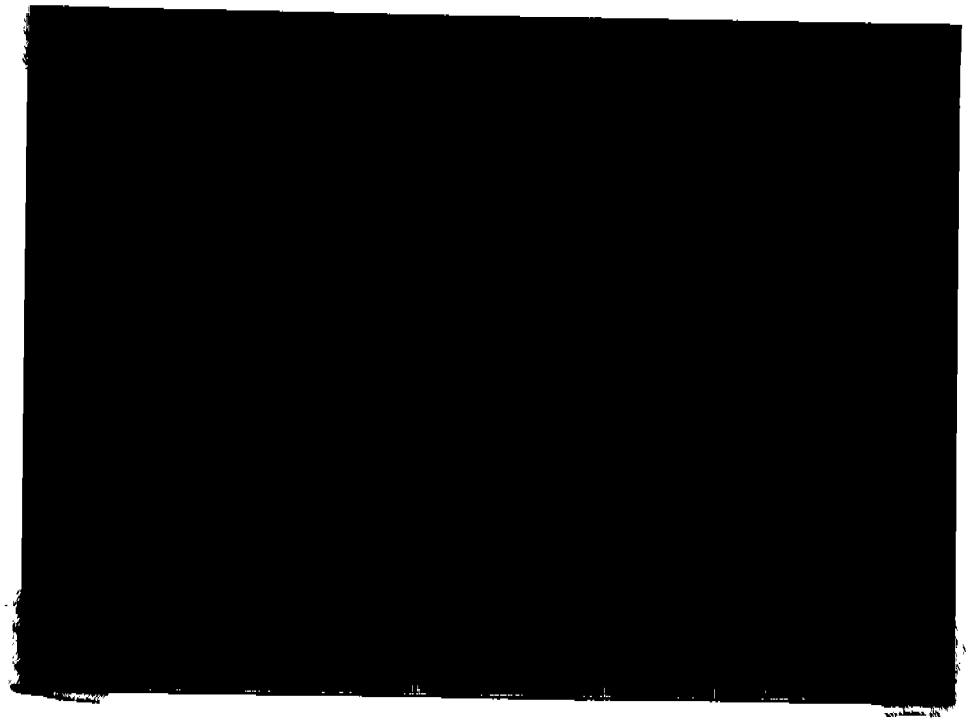
Head, Department of Horticulture — Date 10-9-81



Addendum to Exhibit "D" - Description of Variety

CHECK VARIETIES:	Salina	O'Connor's	Palestine
Plant height (cm)	27	24	22
Plant width (cm)	42	55	48
Heads/Plant	7-12 (9)	8-10 (9)	10-15 (14)
Time of Flower	June 15	June 10	June 22
Growth habit	2/2	1/2	1/2
Leaf Width (mm)	14-16 (15)	13-15 (13)	17-25 (19)
Leaf Length (mm)	21-28 (26)	20-25 (22)	19-28 (26)
Petiole Width (mm)	1.4-2.0 (1.6)	1.2-1.7 (1.3)	1.3-1.6 (1.4)
Petiole Length (mm)	172-188 (176)	142-168 (154)	139-151 (143)
Color	2	2	2
Stolon (dia. mm)	2.7-4.0 (3.2)	2.0-2.7 (2.3)	2.5-3.2 (2.9)

Note : Measurements were taken as outlined in Exhibit C. Mean value of measurements is shown in parenthesis.



1. 'Fresa'
2. 'Salina'
3. 'Palestine'
4. 'O'Connor's'
5. White clover