No. 8100167

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Moran Seeds, 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 HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

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

LETTUCE

'Yuma'

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 *this* 29th *day of* March *in the year of our Lord one thousand nine hundred and* eighty-five.

Attest:

Kenneth A. [illegible]
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

John R Block
Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

FORM APPROVED
OMB NO. 40-R3822

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY: Yuma	1b. VARIETY NAME: Yuma	FOR OFFICIAL USE ONLY — PV NUMBER: 8100167
2. KIND NAME: Lettuce	3. GENUS AND SPECIES NAME: Lactuca sativa	FILING DATE: 9/9/81 — TIME: 1:00 A.M. (P.M.)
4. FAMILY NAME (BOTANICAL): Compositae	5. DATE OF DETERMINATION: March 31, 1979	FEE RECEIVED: $ 500.00 $ 250.00 — DATE: 9/9/81 3/5/85
6. NAME OF APPLICANT(S): Moran Seeds, Inc.	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*: 1155 Harkins Rd., Salinas, CA 93901	8. TELEPHONE AREA CODE AND NUMBER: (408) 757-3651
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*: Corporation	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION: Delaware - 1964	11. DATE OF INCORPORATION: 4-29-64

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: Donald G. Bergam
Moran Seeds, Inc.
1155 Harkins Rd., Salinas, CA 93901 .

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14a. 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). (If "Yes," answer 14B and 14C below.)* [ ] YES [X] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? [ ] YES [X] NO

14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED? [ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed 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 Act.

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

September 4, 1981
(DATE)

Richard [signature]
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

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. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, 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

5 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.

13a 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.

13b 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.

13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.

13d 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.

RECEIVED
SEP 9 1981
U.S. DEPARTMENT
AMS, LPG&S Div.
PVPO

14a 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.)

15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

EXHIBIT A

Origin and Breeding History of the Variety

Lettuce: Yuma

1. Yuma originated from a single plant selection of the variety Winterhaven made in June, 1975, in the Hollister area of California. Winterhaven does not head-in well under long day, warm temperature conditions. Yuma evolved from one of three selections made for good heading ability and plant vigor.

2. Two generations of mass selection, based on plant vigor, heading ability, head conformation and butt appearance, were made in 1976 and 1977. Trial evaluations following the second generation of mass selecting were conducted in the desert areas of Arizona and California and San Juan Bautista, California. Yuma was uniform for type with no variants other than the natural rogue mutation found in most crisphead lettuce varieties. The natural rogue, a semi-cos type plant with leaves longer than broad and poor heading ability, occurs at a frequency of approximately 1 in 800 plants.

3. A small seed increase was made in 1978. Research and field trial evaluations of the increase and two subsequent increases made in 1979 and 1980 indicated that Yuma was genetically uniform for type and free of variants other than the natural rogue mutation.

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EXHIBIT B

NOVELTY STATEMENT

Lettuce: Yuma

Yuma is a crisphead lettuce variety belonging to the Moranguard group of the Vanguard varietal type. Moranguard, released in 1968, is distinguished from Vanguard by its greater plant and head size, slower bolting tendency and taller seedstalk.

Yuma is a vigorous growing variety from seedling emergence through harvest with large frame and head size. It has outstanding ability to make large, solid heads under cold weather conditions during the winter cropping conditions in the desert areas of Arizona and California. Yuma has little tendency to produce oblong or elongated heads and has a lower incidence of this characteristic than Moranguard or Winterhaven.

The wrapper leaves are dull dark green, broad, thick, moderately savoyed and provide good head protection. Foliage color at maturity is less yellow green than Moranguard (143C vs 146A, Royal Horticultural Society color chart). Interior color is creamy to yellow. Yuma averages larger frame diameter than Moranguard (19.1 inches vs. 18.5 inches) and smaller frame diameter than Winterhaven (19.1 inches vs. 19.6 inches). Yuma produces mature heads that average more spherical in shape with a greater depth (polar diameter) to width (equatorial diameter) ratio than Winterhaven. [Yuma - 5.96 inches depth: 5.89 inches width. Winterhaven - 5.68 inches depth: 6.14 inches width]. Yuma has excellent butt appearance with good color, flat ribs and the butt remains flat under environmental conditions where Winterhaven tends to point. The green color extends further into the butt than Moranguard or Winterhaven and is particularly evident when the heads are trimmed for film-wrapped packs.

Yuma is best adapted for winter cropping in the desert areas. Under cold weather conditions, Yuma averages 5-8 days earlier maturity than Vanguard, 2-4 days earlier than Moranguard and 2 days earlier maturity than Winterhaven. Under summer cropping, Yuma is slower bolting and has taller seedstalks than Vanguard, Vanmax, Coolguard and Vanagara. The seed color is black.

<u>Summary</u>: Yuma most closely resembles Moranguard and Winterhaven but Yuma has: (1) less yellow green foliage color at harvest maturity than Moranguard (143C vs. 146A, Royal Hort. Soc. color chart), (2) larger average frame diameter than Moranguard (19.1 48.7cm inches vs. 47.1 18.5 inches) and smaller average frame diameter than Winterhaven (19.1 inches vs. 19.6 inches), and (3) more spherical head with a greater depth to width ratio than Winterhaven. Mature heads of Yuma average 5.96 inches depth and 5.89 inches width whereas, Winterhaven heads average 5.68 inches depth and 6.14 inches width.

FORM GR-471
(4-3-72)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C

OBJECTIVE DESCRIPTION OF VARIETY
(LETTUCE)

INSTRUCTIONS: See reverse.

NAME OF APPLICANT(S)
Moran Seeds, Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)
1155 Harkins Road
Salinas, California 93901

FOR OFFICIAL USE ONLY
PVPO NUMBER
297 - 1 - 8100167
VARIETY NAME OR TEMPORARY DESIGNATION

Place the appropriate number that describes the varietal character of this variety in the boxes below.

1. PLANT TYPE: [4 3]
10 = CUTTING (Leaf) 20 = STALK
50 = BUTTERHEAD 60 = LATIN
70 = OTHER (Specify) _____

30 = COS
31 = SELF-CLOSING GROUP
32 = LOOSE-CLOSING GROUP

40 = CRISPHEAD
41 = IMPERIAL GROUP
42 = GREAT LAKES GROUP
43 = VANGUARD
44 = NEW YORK GROUP

2. SEED COLOR: [2] 1 = WHITE 2 = BLACK 3 = YELLOW

3. ANTHOCYANIN: [1] 1 = ABSENT 2 = PRESENT

4. LEAF CONTAINING ANTHOCYANIN: [4] 1 = COVERED 2 = SPOTTED 3 = ALONG MARGIN 4 = ABSENT 5 = OTHER (Specify) _____

5. LEAF SURFACE TEXTURE: [2] 1 = SMOOTH 2 = BLISTERED

6. LEAF SURFACE REFLECTANCE: [1] 1 = DULL 2 = GLOSSY 3 = OTHER (Specify) _____

7. LEAF MARGIN: [2] 1 = STRAIGHT 2 = WAVY 3 = CURLED

[2] 1 = ENTIRE 2 = DENTATE 3 = INCISED 4 = DEEPLY INCISED 5 = OTHER (Specify) _____

8. LEAF SHAPE: [1] 1 = ROUNDED 2 = POINTED

[1] 1 = BROADER THAN LONG 2 = LONGER THAN BROAD 3 = OTHER (Specify) _____

9. LEAF COLOR: (See reverse.)
[7] 1 = RED 2 = REDDISH-BROWN 3 = YELLOW 4 = YELLOWISH-GREEN 5 = GREYISH-GREEN
6 = BLUE-GREEN 7 = DARK-GREEN 8 = VERY DARK GREEN

10. HEADS: [1] 1 = SPHERICAL 2 = FLATTENED 3 = ELONGATE 4 = POINTED 5 = NON-HEADING

11. PLANT SIZE: (See reverse.) [3] 1 = SMALL 2 = MEDIUM 3 = LARGE

12. CULTURE: [2] 1 = SUMMER CROP 2 = WINTER CROP 3 = NOT SPECIFIC 4 = UNDER GLASS 5 = OTHER (Specify) _____

13. SIZE OF 10-DAY OLD SEEDLING GROWN UNDER CONSTANT LIGHT (Growth Chamber) AT 25° C.: (Place a zero in first box (i.e. [0 2]) when size is 9 mm. or less.)
[7 1] mm. LENGTH OF SEEDLING [1 2] mm. LENGTH OF COTYLEDON [0 6] mm. WIDTH OF COTYLEDON

14. DISEASE RESISTANCE TO: (Enter zeroes in box(es) where there is no special disease resistance.)
[1] 1 = TIPBURN [0] 2 = MOSAIC [0] 3 = DAMPING OFF [0] 4 = DOWNY MILDEW
[0] 5 = SCLEROTINIA ROT [0] 6 = BROWN BLIGHT [0] 7 = BIG VEIN [ ] 8 = OTHER (Specify) _____

15. OUTLINE THE FOURTH LEAF: (For standardization purposes, the fourth leaf should be taken from a 20-day old plant grown under constant light.)

8100167

FORM GR-471 (REVERSE)

16. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY
Leaf color	Vanguard
Leaf pigmentation	Vanguard
Leaf shape	Winterhaven
Plant size	Winterhaven
Head size	Winterhaven

VARIETY	NO. OF DAYS TO HEAD MATURITY UNDER WINTER CROPPING	LOCATION	NO. OF DAYS TO HEAD MATURITY UNDER SUMMER CROPPING	LOCATION	NO. OF DAYS TO SEED STALK EMERGENCE UNDER SUMMER CROPPING	LOCATION
Submitted	approx. 118	Yuma, Ariz.	81	San Juan Bautista, CA	approx. 94	San Juan Bautista, CA
Similar	approx. 122	same	83	same	approx. 96	same
Name of similar variety →	Moranguard		Moranguard		Moranguard	

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for completing this form:

1. C. M. Rodenburg, 1960, Varieties of Lettuce, An International Monograph, Institunt Voor de Veredeling van Tuinbouwgewassen, Wageningen, Holland.

2. L. L. Morse, 1930, Field Notes on Lettuce, published by Ferry-Morse Seed Co.

LEAF COLOR: Nickerson's or any recognized color fan may be used to determine the leaf color of the described variety. The following lettuce varieties may be used as a guide to identify the eight colors listed on the form.

Color	Variety
Red	"Salad Trim"
Reddish-brown	"Ruby"
Yellow	"Salad Bowl"
Yellowish-green	"Oakleaf"
Greyish-green	"White Boston"
Bluish-green	"Bibb"
Dark-green	"Imperial" group
Very dark green	"Deer Tongue"

PLANT SIZE: The following varieties may be used as a guide to identify the plant type size:

TYPE	COMPARABLE VARIETIES		
	SMALL	MEDIUM	LARGE
Cutting (leaf)	Boston-Curled	Prize Head	Grand Rapids
Stalk (stem)	Celtuce	--	--
Cos	Express	Parris Island	Giant White
Crisphead	Mignonette	Hanson (Merit)	Climax
Butterhead	Tom Thumb	Big Boston	Mammoth Butter
Latin	Sucrine	Creole	Deer Tongue

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EXHIBIT C

Objective Description of Variety

LETTUCE: Yuma

Section 15: Outline the Fourth Leaf

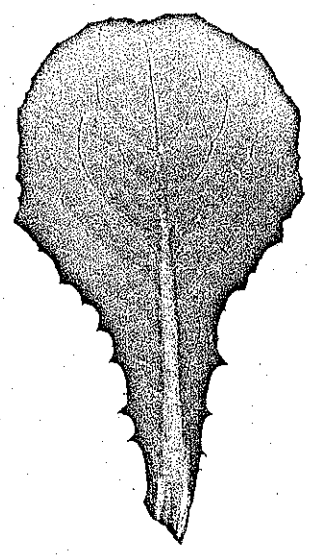

EXHIBIT D

Additional Description of the Variety

Lettuce: Yuma

Yuma differs from other varieties of the Vanguard varietal type as follows:

1. Vanguard: Yuma is slower bolting, has taller seedstalks and has larger plant size.

2. Vanguard 75: Vanguard 75 is similar in type to Vanguard but has lettuce mosaic virus resistance.

3. Vanagara: Yuma has larger plant size, taller seedstalks and is slower bolting. Vanagara is intermediate in type between Yuma and Vanguard and does not perform as well as Yuma under cooler growing conditions.

4. Vanmax: Yuma is slower bolting, has taller seedstalks, darker green color and larger plant size.

5. Coolguard: Yuma is slower bolting under summer growing conditions and has taller seedstalks.

6. Domingos 42: Yuma has larger frame and plant size and is earlier in maturity under winter cropping conditions. Domingos 42 is better adapted for growing in the Vanguard season.

7. Crispy: Yuma has better plant vigor and larger frames. Crispy normally fails to make good size in the winter season.

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EXHIBIT D ADDENDUM

ADDITIONAL DESCRIPTION OF THE VARIETY

Lettuce: Yuma

I. Frame diameter:

Yuma averages larger frame diameter in comparison with Moranguard and smaller frame diameter in comparison with Winterhaven. The data in the following table is based on 5 trials in the San Juan Bautista, CA area. (15 plants per variety per trial)

TRIAL NO.	YUMA	MORANGUARD	WINTERHAVEN
1	19.4"	18.7"	19.8"
2	17.4"	16.8"	18.1"
3	20.1"	19.2"	20.7"
4	18.0"	17.3"	18.5"
5	20.8"	20.3"	21.2"
AVERAGE	19.1 inches	18.5 inches	19.6 inches

II. Foliage color

Yuma has less yellow green foliage color at harvest maturity than Moranguard. (Based on the Royal Horticultural Society color chart).

Yuma: 143C
Moranguard: 146A

III. Head shape

Yuma produces mature heads that average more spherical in shape with a greater depth (polar diameter) to width (equatorial diameter) ratio than Winterhaven. [Yuma - 5.96 inches depth: 5.89 inches width. Winterhaven - 5.68 inches depth: 6.14 inches width]. The statistical analysis of the data on the following pages is based on 7 trials in the San Juan Bautista, CA area.

EXHIBIT D Addendum
Page Two (2)

Lettuce: Yuma

III. Head shape

A. Polar diameter comparison. (Measurements in inches)

TRIAL NO.	YUMA	WINTERHAVEN	HARVEST DATE
1 (20 plants per variety)	5.63	5.36	5.49
2 (25 plants per variety)	6.10	5.93	6.01
3 (25 plants per variety)	6.05	5.62	5.83
4 (15 plants per variety)	5.95	5.63	5.79
5 (30 plants per variety)	5.93	5.71	5.82
6 (10 plants per variety)	5.86	5.59	5.73
7 (15 plants per variety)	6.19	5.91	6.05
$\bar{x}$	5.96	5.68	5.82

Analysis of variance

	df	SS	MS	F
Total	13	.7078		
Trials	6	.4134	.0689	20.88**
Variety	1	.2744	.2744	83.15**
V X T (Error)	6	.0200	.0033	

Coef. of Variation = 1.0% Standard error = .01 LSD = .06

EXHIBIT D Addendum
Page Three (3)

Lettuce: Yuma

III. Head shape

B. Equatorial diameter comparison. (Measurements in inches)

TRIAL NO.	YUMA	WINTERHAVEN	HARVEST DATE
1 (20 plants per variety)	6.24	6.53	6.39
2 (25 plants per variety)	6.05	6.34	6.19
3 (25 plants per variety)	5.80	5.97	5.89
4 (15 plants per variety)	5.57	5.75	5.66
5 (30 plants per variety)	5.81	5.96	5.89
6 (10 plants per variety)	5.72	5.84	5.78
7 (15 plants per variety)	6.05	6.10	6.07
$\bar{x}$	5.89	6.14	6.01

Analysis of Variance

	df	SS	MS	F
Total	13	.8939		
Trials	6	.7594	.1265	33.29**
Variety	1	.1116	.1116	29.37**
V X T (Error)	6	.0229	.0038	

Coef. of Variation = 1% Standard error = .04 LSD = .10

EXHIBIT D Addendum
Page Four (4)

Lettuce: Yuma

III. Head shape

C. Shape comparison - Polar diameter/Equatorial diameter Ratio

TRIAL NO.	YUMA	WINTERHAVEN	HARVEST DATE
1	0.91	0.82	0.87
2	1.01	0.94	0.97
3	1.04	0.94	0.99
4	1.07	0.98	1.03
5	1.02	0.96	0.99
6	1.03	0.96	0.99
7	1.02	0.97	0.99
$\bar{x}$	1.01	0.94	0.97

Analysis of Variance

	df	SS	MS	F
Total	13	.0527		
Trials	6	.0316	.0053	26.5**
Variety	1	.0200	.0200	100.00**
V X T (Error)	6	.0011	.0002	

Coef. of Variation = 1.5% Standard error = .01 LSD = .02

Lettuce: Yuma

III. Head shape

D. General conclusions based on combined trial data:

Each trial (Harvest Date) was handled as a replicate in combining the data. The Variety X Harvest Date mean square was used as the error term.

Yuma is significantly rounder in head shape than Winterhaven with a P/E ratio of 1.01 for Yuma and 0.94 for Winterhaven. Significance was at the 1% level. LSD is 0.02.

Yuma has a significantly deeper head than Winterhaven (Polar diameter). The depth of head for Yuma is 5.96 inches whereas the depth of head for Winterhaven is 5.68 inches. Significance was at the 1% level. LSD is 0.06 inches.

Winterhaven has a significantly broader head than Yuma (Equatorial diameter). The head width of Yuma is 5.89 inches whereas the head width of Winterhaven is 6.14 inches. Significance was at the 1% level. LSD is 0.10 inches.

IV. Yuma compared to Monterey:

Yuma is susceptible to U.S. Race 5 of Down Mildew while Monterey is resistant. Yuma is adapted for winter cropping in the desert areas of California and Arizona while Monterey is adapted for mid and late summer harvest in the Central Coast districts of California.

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EXHIBIT D Addendum
Page Six (6)

Lettuce: Yuma

V. Photograph of Yuma plant at harvest maturity

Illustration of Yuma plant at harvest maturity and detached leaf showing the leaf margin pattern.

EXHIBIT D ADDENDUM page 6 7

ADDITIONAL DESCRIPTION OF THE VARIETY

Lettuce: "Yuma", Application No. 8100167

I. Yuma compared to Vanguard:

A. Seedstalk emergence (Number of days to seedstalk emergence under summer cropping, San Juan Bautista, CA):

Vanguard - 80 days average
Yuma - 94 days average

B. Seedstalk height:

Vanguard - 111.8 cm. average
Yuma - 144.8 cm. average

C. Frame Diameter:

Vanguard - 43.43 cm. average
Yuma - 48.51 cm. average

II. Yuma compared to Vanguard 75:

Vanguard 75 is similar in horticultural and reproductive characteristics to Vanguard but is resistant to Lettuce Mosaic Virus. Yuma is susceptible to Lettuce Mosaic Virus.

III. Yuma compared to Vanguard 30:

A. Foliage color (Based on the Royal Horticultural Society color chart). Yuma has lighter green color at harvest maturity than Vanguard 30.

Vanguard 30 - 143A
Yuma - 143C

B. Frame diameter: Yuma has larger average frame diameter than Vanguard 30.

Vanguard 30 - 46.23 cm. average
Yuma - 48.51 cm. average

C. Maturity: Under winter cropping conditions in the Yuma, Arizona area, Yuma consistently matures 4-6 days earlier than Vanguard 30.

Vanguard 30 - 123 days average
Yuma - 118 days average

8100167

ASSIGNMENT

WHEREAS, Moran Seeds, Inc. ("Moran"), a corporation duly organized and existing under the laws of the State of Delaware is the owner of United States Plant Variety Protection Certificates (the "Certificates"), listed in Exhibit A hereto and Pending United States Plant Variety Protection Applications (the "Applications"), listed in Exhibit B hereto; and

WHEREAS, in accordance with a Technology Transfer Agreement (the "Transfer Agreement") among Celanese Corporation ("Celanese"), Moran Seeds, Inc., Joseph Harris Company, Inc., CelPril Industries, Inc., Harris Moran International B.V. ("Sellers"), Virginia Chemicals, Inc., Les Produits Organiques du Santerre-Orsan S.A. ("Orsan"), HMS Acquisition Inc., CP Acquisition Inc., and Exploitatiemaatschappij Wolwevershaven B.V., dated January 10, 1985, and a Purchase Agreement dated December 7, 1985, as amended, among Celanese, Sellers and Orsan, Orsan has purchased from Moran said Certificates and Applications.

NOW, THEREFORE, in accordance with said Transfer Agreement and Purchase Agreement, Moran assigns to Orsan all of its rights, title and interest in and to said Certificates and Applications.

Moran hereby authorizes Orsan to apply for and obtain the recordation of this Assignment. Moran agrees that it shall, without further consideration, promptly and duly cause to be performed such lawful acts and execution of any other documents as Orsan may reasonably request in order for Orsan to obtain the full benefits of this Assignment and to permit Orsan to be duly recorded in each office, bureau and tribunal in the appropriate jurisdiction as the registered owner or proprietor of each of the rights hereby assigned. Such instruments and documents shall include, without limitation, such applications, affidavits and other documents for filing in such jurisdictions as Orsan may from time to time reasonably request.

By these presents Orsan does hereby accept this Assignment and authorize the recording thereof with the appropriate authorities aforesaid.

8100167

IN WITNESS WHEREOF, the parties have caused this Assignment to be executed by its proper officers thereunto duly authorized this 10th day of January, 1985.

MORAN SEEDS, INC.,
Assignor

By David A. Jenkins
David A. Jenkins
Vice President

LES PRODUITS ORGANIQUES DU
SANTERRE-ORSAN S.A.
Assignee

By:
Title: Attorney-in-fact

8100167

STATE OF New York

COUNTY OF New York

Before me, a Notary Public, in and for said County, personally appeared David Jenkins who acknowledged that he is Vice President of Moran Seeds, Inc., the corporation which executed the foregoing instrument and who acknowledged he signed said instrument on behalf of said corporation by authority of its Board of Directors; and that said instrument is the free corporate act and deed of said Moran Seeds, Inc.

Sworn before me at New York this 10th day of January, 1985

Alex C. Lengyel
NOTARY PUBLIC

(Notary Public)

My Commission Expires:

ALEX C. LENGYEL
Notary Public, State of New York
No. [illegible]
Qualified in New York County
Commission Expires March 30, 19[illegible]6

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STATE OF New York

COUNTY OF New York

Before me, a Notary Public, in and for said County, personally appeared Patrice LeHodey who acknowledged that he is ~~Attorney~~ Fact of Les Produits Organiques du Santerre-Orsan S.A., the corporation which executed the foregoing instrument and who acknowledged he signed said instrument on behalf of said corporation by authority of its Board of Directors; and that said instrument is the free corporate act and deed of said Les Produits Organiques du Santerre-Orsan S.A.

Sworn before me at New York this 10th day of January, 1985.

Alex C. Lengyel
NOTARY PUBLIC

(Notary Public)

My Commission Expires:

ALEX C. LENGYEL
Notary Public, State of New York
No. 31 48[illegible]
Qualified in New York County
Commission Expires March 30, 1986

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DEED OF ASSIGNMENT

WHEREAS, Les Produits Organiques du Santerre - ORSAN (S.A.), a French corporation having a place of business at 16 rue Ballus, 75009 Paris, France (hereinafter referred to as "ASSIGNOR") owns and is using the Plant Variety Protection Certificates listed on the attached Exhibit for the indicated varieties which were awarded to ASSIGNOR by the Secretary of Agriculture on the indicated dates upon applications filed with the United States Plant Variety Protection Office; and

WHEREAS, Arisix (S.A.), a French corporation having a place of business at 61 rue des Belles Feuilles, 75116 Paris, France,

(hereinafter referred to as "ASSIGNEE") is desirous of acquiring the entire right, title and interest in and to the said varieties and Plant Variety Protection Certificates;

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN: Be it known that, for good and valuable consideration, receipt of which is hereby acknowledged, ASSIGNOR has sold, assigned and transferred, and by these presents does sell, assign and transfer unto said ASSIGNEE, and ASSIGNEE'S successors and assigns, all right, title and interest in and to the said varieties and said Plant Variety Protection Certificates in the United States including reissues, and including the right to enforce such rights against any past, present or future violation thereof, the said interest to be held and enjoyed by said ASSIGNEE as fully and exclusively as it would have been and enjoyed by said ASSIGNOR had this assignment and transfer not been made, to the full end and term of any right, title and interest assigned and transferred hereby.

ASSIGNOR further agrees that it will, without charge to said ASSIGNEE, but at ASSIGNEE's expense, cooperate with ASSIGNEE in the assignment of said Certificates and the perfection of all rights thereto, execute, verify, acknowledge and deliver all such further papers and instruments of assignment and transfer

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thereof, and will perform such other acts as ASSIGNEE lawfully may request, to obtain or maintain the listed Certificates and to vest title thereto in said ASSIGNEE or ASSIGNEE's successors and assigns.

IN TESTIMONY WHEREOF, an authorized representative of ASSIGNOR has hereunto signed its name to this assignment on the date indicated below.

Les Produits Organiques du Santerre
– ORSAN (S.A.)

Date: 1/11/95

PHILIPPE ROLLIER
Print Name

PRESIDENT
Print Title

On this date, _____, 1993, before me, the undersigned notary public, personally appeared the above-named assignor, known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same.

_____
(Notaire)

Seal/Stamp

Vu pour certification matérielle de la signature figurant ci-contre, de Philippe ROLLIER par Me ROURGES
Fait à Paris, le 11/1/1995
Notaires

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DEED OF ASSIGNMENT

WHEREAS, Arisix (S.A.), a French corporation having a place of business at 61 rue des Belles Feuilles, 75116 Paris, France (hereinafter referred to as "ASSIGNOR") owns and is using the Plant Variety Protection Certificates listed on the attached Exhibit for the indicated varieties which were awarded to ASSIGNOR by the Secretary of Agriculture on the indicated dates upon applications filed with the United States Plant Variety Protection Office; and

WHEREAS, Clause (S.A.), a French corporation having a place of business at 1 Avenue Lucien Clause, 91221 Bretigny sur ORGE Cedex, France,

(hereinafter referred to as "ASSIGNEE") is desirous of acquiring the entire right, title and interest in and to the said varieties and Plant Variety Protection Certificates;

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN: Be it known that, for good and valuable consideration, receipt of which is hereby acknowledged, ASSIGNOR has sold, assigned and transferred, and by these presents does sell, assign and transfer unto said ASSIGNEE, and ASSIGNEE'S successors and assigns, all right, title and interest in and to the said varieties and said Plant Variety Protection Certificates in the United States including reissues, and including the right to enforce such rights against any past, present or future violation thereof, the said interest to be held and enjoyed by said ASSIGNEE as fully and exclusively as it would have been and enjoyed by said ASSIGNOR had this assignment and transfer not been made, to the full end and term of any right, title and interest assigned and transferred hereby.

ASSIGNOR further agrees that it will, without charge to said ASSIGNEE, but at ASSIGNEE's expense, cooperate with ASSIGNEE in the assignment of said Certificates and the perfection of all rights thereto, execute, verify, acknowledge and deliver all such further papers and instruments of assignment and transfer

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thereof, and will perform such other acts as ASSIGNEE lawfully may request, to obtain or maintain the listed Certificates and to vest title thereto in said ASSIGNEE or ASSIGNEE's successors and assigns.

IN TESTIMONY WHEREOF, an authorized representative of ASSIGNOR has hereunto signed its name to this assignment on the date indicated below.

Arisix (S.A.)

Date: 1/11/95

P DE SAINT RAPT

Print Name

PRESIDENT

Print Title

On this date, _____, 1993, before me, the undersigned notary public, personally appeared the above-named assignor, known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same.

(Notaire)

Seal/Stamp

Vu pour certification matérielle de la signature figurant ci-contre, de M. de SAINT RAPT
Fait à Paris, le 1/1/1995

S.C.P. B. CHEUVREUX - R. BOURGES
Notaires
77, Bd Malesherbes, 75008 PARIS

EXHIBIT

Certif. #	Date Status Begins	Crop	Variety Name	
~~7600032~~	~~09/15/77~~	~~Lettuce~~	~~Vanagara~~	Expired
~~7600039~~	~~12/08/77~~	~~Lettuce~~	~~Morangold~~	Expired
~~7605018~~	~~09/28/77~~	~~Marigold~~	~~Cabaret Orange~~	Expired
7800028	05/31/79	Muskmelon	Valley Gold	
7800033	12/21/78	Radish	Fancy Red	
7800086	01/25/79	Lettuce	Deep Red	
7900038	01/14/82	Garden Bean	Blue Duet	
7900039	07/15/82	Garden Bean	Score	
7900066	11/27/79	Cauliflower	Snowball 123	
8000020	07/31/80	Muskmelon	Top Net	
8000082	12/10/81	Lettuce	Delmar	
8100167	3/29/85	Lettuce	Yuma	
8100172	09/29/83	Lettuce	Van Mor	
8200027	04/23/83	Lettuce	El Toro	
8200045	09/23/82	Turnip	Royal Gem	
8200061	03/24/83	Watermelon	Sun Gold	
8200068	12/30/82	Egg Plant	Little Fingers	
8200104	10/28/82	Tomato	Advantage	
8200105	11/26/82	Tomato	Moran 3053	
8300024	12/30/83	Radish	Red King	
8300113	08/31/84	Muskmelon	Top Net SR	
8300155	02/22/85	Celery	Bishop	
8300156	01/25/85	Celery	Deacon	
8300172	11/29/85	Tomato	Harris Morgan 3075	
8400013	2/19/88	Lettuce	Greenfield	
8600032	03/11/88	Tomato	Murrieta II	

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PLANT VARIETY PROTECTION REGISTRATION ASSIGNMENTS

Clause, S.A. to Harris Moran Seed Company

WHEREAS, Clause, S.A. ("Assignor"), a corporation organized and existing under the laws of France, has sold and transferred assets, including plant variety protection registrations, to Harris Moran Seed Company ("Assignee"), a corporation organized and existing under the laws of the State of Maryland;

WHEREAS, Assignor, is the owner of the following plant variety protection registrations:

VARIETY NAME	Registration No.	Issue Date
BLUE DUET	7900038	01/14/82
SCORE	7900039	07/15/82
TOP NET SR	8300113	08/31/84
TOP NET	8000020	07/31/80
SNOWBALL 123	7900066	11/27/79
BISHOP	8300155	02/22/85
DEACON	8300156	01/25/85
LITTLE FINGERS	8200068	12/30/82
EL TORO MI	8200027	04/28/83
DELMAR MI	8000082	12/10/81
GREENFIELD MI	8400013	02/19/88
VAN MOR MI	8100172	03/29/83
YUMA MI	8100167	03/29/85

8100167

RED KING	8300024	12/30/83
MORAN 3053	8200105	11/26/82
ADVANTAGE	8200104	10/28/82
HARRIS MORAN 3075	8300172	11/29/85
ROYAL GEM	8200045	09/23/82
SUN GOLD	8200061	03/24/83

WHEREAS, Assignor is desirous of selling and Assignee is desirous of acquiring the aforesaid plant variety protection registrations of Assignor.

NOW THEREFORE, for $10.00 and other good and valuable consideration, the receipt of which is hereby acknowledged, Assignor, by these presents sells, assigns and transfers to Assignee, its successors and assigns, all right title and interest in and to the above-referenced plant variety protection registrations, to be held and enjoyed by said Assignee, as fully as the same would have been enjoyed by said Assignor, had this assignment not been made.

Assignor also assigns and transfers to Assignee, any and all causes of action, claims, demands, or other rights occasioned from or because of any and all past infringement of any of the above referenced plant variety protection registrations.

Assignor further agrees that upon request, it will execute any and all documents necessary to vest all rights, title and interest in and to the above-referenced plant variety protection registrations

8100167

IN WITNESS WHEREOF, said Assignor, has affixed its signature hereto this 22 day of January, 1997.

CLAUSE, S.A.

By: [signature]
Name: John W. Powell
Title: Chairman

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Exhibit A

United States Plant Variety Protection Certificates

Cert. No.	Date Issued	Kind	Variety Name	Owner
7200145	10/30/74	Garden Bean	Gem	Moran Seeds, Inc.
7200146	11/15/74	Watermelon	Charleston 76	Moran Seeds, Inc.
7400013	5/9/74	Lettuce	Calmaria	Moran Seeds, Inc.
7400014	6/19/74	Lettuce	Cal K-60	Moran Seeds, Inc.
7400071	6/19/74	Lettuce	Cabrillo	Moran Seeds, Inc.
7600032	9/15/77	Lettuce	Vanagara	Moran Seeds, Inc.
7600039	12/8/77	Lettuce	Morangold	Moran Seeds, Inc.
7800028	5/31/79	Muskmelon	Valley Gold	Moran Seeds, Inc.
7900038	1/14/82	Garden Bean	Blue Duet	Moran Seeds, Inc.
7900039	7/15/82	Snapbean	Score	Moran Seeds, Inc.
7900066	11/27/79	Cauliflower	Snowball 123	Moran Seeds, Inc.
8000020	7/31/80	Muskmelon	Top Net	Moran Seeds, Inc.
8000082	12/10/81	Lettuce	Delmar	Moran Seeds, Inc.
8200019	10/28/82	Onion	OMO M	Moran Seeds, Inc. Oshita, Inc.
8200061	3/24/83	Watermelon	Sun Gold	Moran Seeds, Inc.
8200104	10/28/82	Tomato	Advantage	Moran Seeds, Inc.
8200105	11/26/82	Tomato	Moran 3053	Moran Seeds, Inc.
8200027	4/23/83	Lettuce	El Toro	Moran Seeds, Inc.
8100172	9/29/83	Lettuce	Van Mor	Moran Seeds, Inc.
8300113	8/31/84	Muskmelon	Top Net SR	Moran Seeds, Inc.

Exhibit B

Pending United States Plant Variety Protection Applications

Application No.	Filing Date	Kind	Variety Name	Owner
8100167	9/9/81	Lettuce	Yuma	Moran Seeds, Inc.
8300155	7/18/83	Celery	Bishop	Moran Seeds, Inc.
8300156	7/18/83	Celery	Deacon	Moran Seeds, Inc.
8300172	9/1/83	Tomato	Diego	Moran Seeds, Inc.
8400013	12/1/83	Lettuce	Greenfield	Moran Seeds, Inc.

ASSIGNMENT OF INTELLECTUAL PROPERTY

WHEREAS, HARRIS MORAN SEED COMPANY, a corporation duly organized and existing under the laws of the State of Maryland, having its principal place of business at 4511 Willow Road, Suite 3, Pleasanton, California 94588 ("**Assignor**"), has, pursuant to that certain Bill of Sale and Assignment dated as of June 30, 1997, transferred to FERRY-MORSE SEED COMPANY (CALIFORNIA), a corporation duly organized and existing under the laws of the State of California, having its principal place of business at 555 Codoni Avenue, P.O. Box 4938, Modesto, California 95352-4938 ("**Assignee**"), all of the intellectual property Assignor had adopted, used and was using as of the effective date of this Assignment, including without limitation, the intellectual property represented by the United States Plant Variety Protection Certificates of Assignor identified on Schedule A hereto (collectively, the "**Property**"); and

WHEREAS, on the date hereof, Assignee has changed its name to "Harris Moran Seed Company";

NOW, THEREFORE, effective by this instrument as of the close of business on June 30, 1997, and for good and valuable consideration, receipt of which is hereby acknowledged, Assignor hereby assigns to Assignee any and all right, title and interest worldwide in and to the Property and any and all recordations thereof, including, but not limited to, the use of the Property in any manner, all benefit of any and all prior use of the Property, and any and all rights to initiate claims or proceedings for past, present or future infringements of Assignor's rights, title and interest in and to the Property.

Dated: as of June 30, 1997

HARRIS MORAN SEED COMPANY

By: _____
Philip Ashcraft, President

NEWY01A:171511:1:09/26/97
26757-1

A400370

ENDORSED
FILED
In the office of the Secretary of State
of the State of California

JUN 30 1997

BILL JONES, Secretary of State

CERTIFICATE OF AMENDMENT

OF THE

ARTICLES OF INCORPORATION

OF

FERRY-MORSE SEED COMPANY (CALIFORNIA)

(a California corporation)

To the Secretary of State
State of California

Pursuant to the provisions of the General Corporation Law of the State of California, the undersigned officers of FERRY-MORSE SEED COMPANY (CALIFORNIA), a California corporation (the "**Corporation**"), do hereby certify as follows:

1. The name of the Corporation is Ferry-Morse Seed Company (California).

2. Article One of the Corporation's Articles of Incorporation, which relates to the name of the Corporation, is hereby amended in its entirety to read as follows:

   One. The name of this Corporation is:
   HARRIS MORAN SEED COMPANY.

3. The amendment herein provided for has been approved by the Corporation's Board of Directors.

4. The amendment herein provided for was approved by the written consent of the Corporation's sole shareholder in accordance with the provisions of Section 902 of the California General Corporation Law. The total number of outstanding shares of the corporation is 5,000.

IN WITNESS WHEREOF, each of the undersigned does hereby declare under the penalty of perjury that he or she signed the foregoing Certificate of Amendment as of June 30,

1997, in the Town of Modesto, State of California, in the official capacity set forth beneath his or her signature and that the statements set forth in this certificate are true of his or her own knowledge.

Yves Queste, President

Helen Andritsakis, Secretary

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State of California

SECRETARY OF STATE

OFFICE OF THE SECRETARY OF STATE

VB

2 PAGES

I, *BILL JONES*, Secretary of State of the State of California, hereby certify:

That the attached transcript has been compared with the record on file in this office, of which it purports to be a copy, and that it is full, true and correct.

IN WITNESS WHEREOF, I execute this certificate and affix the Great Seal of the State of California this

JUN 30 1997

THE GREAT SEAL OF THE STATE OF CALIFORNIA
EUREKA

Bill Jones

Secretary of State

SEC/STATE FORM CE-107 (REV. 4/97)

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