No. 8900229

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Dairyland Seed Co., 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 TY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS Y THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'Magnum III'

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* 29th *day of* June *in the year of our Lord one thousand nine hundred and* ninety.

Attest:

Kenneth A. Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Clayton Yeutter

Secretary of Agriculture

APPROVAL EXPIRES 4-30-85

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S): Dairyland Seed Company, Inc.

2. TEMPORARY DESIGNATION: DS503

3. VARIETY NAME: Magnum III

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*: P.O. Box 958, West Bend, WI 53095

5. PHONE *(Include area code)*: 414/338-0163

FOR OFFICIAL USE ONLY

PVPO NUMBER: 8900229

6. GENUS AND SPECIES NAME: Medicago Sativa L.

7. FAMILY NAME *(Botanical)*: Leguminosae

FILING — DATE: May 31, 1989 — TIME: ☐ A.M. ☐ P.M.

8. KIND NAME: Alfalfa

9. DATE OF DETERMINATION: 11/1/84

FEES RECEIVED — AMOUNT FOR FILING: $ 250.— DATE: May 31, 1989 — AMOUNT FOR CERTIFICATE: $ 250.— DATE: June 4, 1990

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*: Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION: Wisconsin

12. DATE OF INCORPORATION:

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

PHONE *(Include area code)*:

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

- 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 Variety *(Request form from Plant Variety Protection Office.)*
- d. ☐ Exhibit D, Additional Description of Variety.
- e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

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)* ☐ No

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

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

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? ☐ Yes *(If "Yes," give date)* ☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? ☒ Yes *(If "Yes," give names of countries and dates)* ☐ No

United States 6/88

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: Thomas [illegible] EXEC. VICE PRES. — DATE: MAY 19, 1989

SIGNATURE OF APPLICANT: — DATE:

8900229

EXHIBIT A

Magnum III is a synthetic variety developed by Dairyland Research International, Clinton, Wisconsin. Parental clones traced to Iroquois(9), MSB-CW5 AN3(8), Cherokee(2), Lahontan (2), PI206452(2), Glory(1), Thor(1), Vernal(1), Everest(1), MNB1(4), MNP-01(4), MNP42(6), California Line(M. Sativa, E. H. Stanford) (4), and Teweles Multi-Strain(8). Parental clones were selected based on progeny tests for one or more of the following traits: forage yield, stand persistence, winter hardiness, seed yield, and resistance to bacterial wilt, Phytophthora root rot, Fusarium wilt, Anthracnose and Verticillium wilt. Parental clones were planted in a cage and interpollinated by bees in Sloughhouse, CA in 1982 to produce Syn. 1 as a Breeder seed. Foundation seed will be produced from Breeder seed and Certified seed either from Breeder or Foundation seed. One generation each of Breeder, Foundation, and Certified seed class is recognized. A maximum of three years each is permitted on stands producing Breeder and Foundation seed. No varients from the description of Exhibit C have been observed during the multiplication process.

EXHIBIT B

Magnum III is most similar to the variety Saranac.

Magnum III is a novel variety, because of it's resistance to bacterial wilt, Fusarium wilt, Phytophthora root rot and moderate resistance to anthracnose (Race 1), Verticillium wilt, spotted alfalfa aphid; and low resistance to Aphanomyces; whereas Saranac is susceptible to Phytophthora root rot, anthracnose (Racel), Verticillium wilt, spotted alfalfa aphid and Aphanomyces.

The flower color is approximately 80% purple, 17% variegated and 1% each of cream, yellow and white; whereas Saranac's flower color is 85% purple, 15% variegated with no cream, yellow and white. Three percent of the plants have the multi-leaflet trait. The literature does not report any multi-leaflet traits for the variety Saranac. Spring vigor of Magnum III (2.34) is significantly better than Saranac (3.50) or Vernal (4.08).

Magnum III provides a combination of forage yield, persistence and disease resistance that exceeds Saranac and Vernal.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

OBJECTIVE DESCRIPTION OF VARIETY

ALFALFA (*Medicago sativa* sensu Gunn et al.)

NAME OF APPLICANT(S)	TEMPORARY DESIGNATION	VARIETY NAME
Dairyland Seed Company, Inc.	DS503	Magnum III

ADDRESS (*Street and No., or R.F.D. No., City, State, and Zip Code*)

P.O. Box 958
West Bend, WI 53095

FOR OFFICIAL USE ONLY

PVPO NUMBER 8900229

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place numbers in the boxes to designate the expressions which are characteristic of the commerical generations of the application variety. Data for quantitative plant characters should be based on a minimum of 100 plants. Include leading zeros when necessary (e.g., [0][8][9]) for quantitative data. Comparative data should be determined from varieties entered in the same trial. Plant color may be precisely designated by using any recognized color chart, e.g., The Munsell Plant Tissue Color Charts.

1. WINTERHARDINESS:

[8] CLASS:

1 = Very Non-Winterhardy (CUF 101)
2 = Non-Winterhardy (Moapa 69)
3 = Intermediately Non-Winterhardy (Mesilla)
4 = Semi-Winterhardy (Lahontan)
5 = (Du Puits)
6 = Moderately Winterhardy (Saranac)
7 = (Ranger)
8 = Winterhardy (Vernal)
9 = Extremely Winterhardy (Norseman)

TEST LOCATION: Clinton, Wisconsin

2. FALL DORMANCY:

FALL DORMANCY (DETERMINED FROM SPACED PLANTINGS)

TESTING INSTITUTION AND LOCATION	DATE OF LAST CUT	DATE REGROWTH SCORED	REGROWTH SCORE OR AVERAGE HEIGHT: APPLICATION VARIETY	CHECK VARIETIES*: Vernal	Sar AR		LSD .05
Dairyland Research International Clinton, WI	9/2/85	10/10/85	27.01	21.23	24.43		2.11

* CUF 101, Moapa 69, Mesilla, Lahontan, Du Puits, Saranac, Ranger, Vernal, or Norseman as appropriate.

Specify scoring system used: Actual height in cm from random sample of 100 plants

[5] Fall Growth Habit (Determined from Fall Dormancy Trials)

1 = Erect (CUF 101)
3 = Semierect (Mesilla)
5 = Intermediate (Saranac)
7 = Semidecumbent (Vernal)
9 = Decumbent (Norseman)

3. RECOVERY AFTER FIRST SPRING CUT (In Southwest, first cut after March 21):

[3]

1 = Very Fast (CUF 101)
3 = Fast (Saranac)
5 = Intermediate (Ranger)
7 = Slow (Vernal)
9 = Very Slow (Norseman)

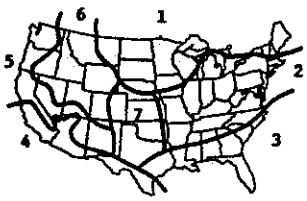
TEST LOCATION: Clinton, Wisconsin

4. AREAS OF ADAPTATION IN U.S. (Where tested and proven adapted):

[1] Primary Area of Adaptation

[0][2] Other Areas of Adaptation

1 = North Central
2 = East Central
3 = Southeast
4 = Southwest
5 = Moderately Winterhardy Intermountain
6 = Winterhardy Intermountain
7 = Great Plains
8 = Other (*Specify*) _____



5. FLOWERING DATE (When 10% of plants possess open flowers at time of first spring cut):

[0][0] Days Earlier Than . . . . . [3]

Same As . . . . . [3]

[0][0] Days Later Than . . . . . [3]

1 = CUF 101
2 = Mesilla
3 = Saranac
4 = Vernal
5 = Norseman

TEST LOCATION: Clinton, Wisconsin

4

8900229

6. PLANT COLOR (Determined from healthy regrowth 3 weeks after first spring cut, controlling leafhoppers if necessary):

[2] 1 = Very Dark Green (524) 2 = Dark Green (Vernal) 3 = Light Green (Ranger)

COLOR CHART VALUE *(Specify chart used:* _____ *):*

APPLICATION VARIETY: _____

VERNAL: _____

TEST LOCATION: Clinton, Wisconsin

7. CROWN TYPE (Determined from spaced plantings):

[2] Noncreeping Types: 1 = Broad (Vernal) 2 = Intermediate (Saranac) 3 = Narrow (CUF 101)

Creeping Types: 4 = Creeping Rooted (Rangelander) 5 = Rhizomatous (Rhizoma)

8. FLOWER COLOR (Determine frequency of plants for each color class as defined by USDA Agricultural Handbook No. 424 (Barnes 1972), allowing all plants in plot to flower):

[0 8 0] % Purple and Violet (Subclasses 1.1 to 1.4)

[0 1 7] % Variegated Other Than Blue (Subclasses 2.1, 2.2, 2.5 to 2.9)

[0 0 1] % Cream (Class 3)

[0 0 0] % Blue (Subclasses 2.3 and 2.4)

[0 0 1] % Yellow (Subclasses 4.1 to 4.4)

[0 0 1] % White (Class 5)

TEST LOCATION: Sloughouse, CA

9. POD SHAPE (Determine frequency of plants with the following pod shapes produced on well cross-pollinated racemes):

[0 9 5] % Tightly Coiled (One or more coils, center more or less closed)

[0 0 5] % Sickle (Less than 1 coil)

[0 0 0] % Loosely Coiled (One or more coils, center conspicuously open)

TEST LOCATION: Sloughouse, California

10. PEST RESISTANCE: Provide in the appropriate column, trial data for application variety, and resistant (R) and susceptible (S) check varieties, synthetic generation tested, average severity index scores (ASI), least significant difference statistics (LSD .05), the institution in charge of test, year, and location of test, and whether test is a field or laboratory evaluation. Describe scoring system, and any test procedure which differs from standard methods proposed by Elgin (1982). Trial data from other test years or locations should be presented whenever available on a separate document as Exhibit D.
Seeds of the check varieties and germplasm lines listed below can be obtained from the USDA Field Crops Laboratory, Bldg. 001, Rm. 335, BARC-West, Beltsville, MD 20705. Although comparisons with check varieties listed below are preferred, comparisons with any appropriate check variety recommended by Elgin (1982) may be presented.

A. DISEASE RESISTANCE:

DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Anthracnose, Race 1 *(Colletotrichum trifolii)*	Application	3	17.2	250		7.2	Dairyland Researc International Clinton, WI 1985 Lab Tested
	Arc (R) SaranacAR		56.5	240			
	Saranac (S)		3.9	200			
	SCORING SYSTEM: Resistant (Healthy), Susceptible (Dead or lesion on stem)						
Anthracnose, Race 2 *(Collectotrichum trifolii)*	Application						NO DATA
	Saranac AR (R)						
	Arc (S)						
	SCORING SYSTEM:						
Bacterial Wilt *(Corynebacterium insidiosum)*	Application	3	49.33	280	2.04	0.39	Univ. of Minn Rosemont, MN 1985 Field Tested
	Vernal (R)		42.00	280	2.28		
	Narragansett (S)		5.23	280	3.69		
	SCORING SYSTEM: 0 to 5, 0+1= Resistant						
Common Leafspot *(Pseudopeziza medicaginis)*	Application						NO DATA
	MSA-CW3AN3 (R)						
	Ranger (S)						
	SCORING SYSTEM:						

5

10. A. PEST RESISTANCE (Continued):

DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Downy Mildew (*Peronospora trifoliorum*)	Application						NO DATA
Isolate, if known:	Saranac (R)						
	Kanza (S)						
	SCORING SYSTEM:						
Fusarium Wilt (*Fusarium oxysporum f. medicaginis*)	Application	3	37.51	280	2.70	0.51	Univ. of Minn. Rosemont, MN 1985 Field Tested
	Moapa 69 (R)		79.67	280	0.91		
	Narragansett (R)	Agate	54.00	280	2.11		
	SCORING SYSTEM:	0 to 5, 0+1=Resistant					
Phytophthora Root Rot (*Phytophthora megasperma f. medicaginis*)	Application	3	38.49	250	4.12	0.58	Dairyland Researc International Clinton, WI 1986 Field Tested
	Agate (R)		42.63	240	4.21		
	Saranac (S)		5.01	240	5.23		
	SCORING SYSTEM:	1 to 6, 1+2=Resistant					
Verticillium Wilt (*Verticillium albostrum*)	Application	3	26.9	200	3.60	0.40	Dairyland Researc International Clinton, WI 1986 Lab Tested
	Vertus (R)		39.10	200	2.90		
	Saranac (S)		5.60	200	4.25		
	SCORING SYSTEM:	1 to 5, 1+2=Resistant					
Other (Specify) Aphanomyces euteiches	Application	3	17.6	200	3.9	.27	Univ. of Wisconsi Madison, WI 1988 Lab Tested
	(R) Aph 12		60.0	200	2.6		
	(S) Saranac		3.4	200	4.2		
	SCORING SYSTEM:	1-5, 1+2+3=Resistant					
Other (Specify)	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

B. INSECT RESISTANCE:

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT DEFOLIATION	DEFOLIATION IN PERCENT OF RESISTANT CHECK	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Alfalfa Weevil (*Hypera postica*)	Application						NO DATA
	Arc (R)			100			
	Saranac (S)						
	SCORING SYSTEM:						

10. B. INSECT RESISTANCE (Continued):

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT SEEDLING SURVIVAL	NUMBER OF SEEDLINGS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Blue Alfalfa Aphid *(Acyrthosiphon kondoi)*	Application						NO DATA
	CUF 101 (R)						
	PA-1 (S)						
	SCORING SYSTEM:						
Pea Aphid *(Acyrthosiphon pisum)*	Application						NO DATA
	Kanza (R)						
	Ranger (S)						
	SCORING SYSTEM:						
Spotted Alfalfa Aphid *(Therioaphis maculata)* *Biotype, if known:*	Application	3	25.9	225		9.8	Dairyland Resear International Clinton, WI 1985 Lab Tested
	Kanza (R)		65.0	225			
	Ranger (S)		2.8	225			
	SCORING SYSTEM: Resistant (Healthy), Susceptible (dead or stunted)						

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Potato Leafhopper Yellowing *(Empoasca fabae)*	Application						NO DATA
	MSA-CW3An3 (R)						
	Ranger (S)						
	SCORING SYSTEM:						
Other *(Specify)*	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

C. NEMATODE RESISTANCE: NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Northern Root Knot *(Meloidogyne hapla)*	Application						NO DATA
	Nev. Syn. XX (R)						
	Lahontan (S)						
	SCORING SYSTEM:						

10. C. NEMATODE RESISTANCE (Continued):

NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Southern Root Knot *(Meloidogyne incognita)*	Application						NO DATA
	Moapa 69 (R)						
	Lahontan (S)						
	SCORING SYSTEM:						
Stem Nematode *(Ditylenchus dipsaci)*	Application						NO DATA
	Lahontan (R)						
	Ranger (S)						
	SCORING SYSTEM:						
Other *(Specify)*	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						

11. INDICATE THE VARIETY THAT MOST CLOSELY RESEMBLES THE APPLICATION VARIETY FOR EACH OF THE FOLLOWING CHARACTERS:

CHARACTER	VARIETY	CHARACTER	VARIETY
Winterhardiness	Vernal	Plant Color	Vernal
Recovery After 1st Cut	Saranac	Crown Type	Saranac
Area of Adaptation	Saranac	Combined Disease Resistance	
Flowering Date	Saranac	Combined Insect Resistance	

REFERENCES

Barnes, D.K. 1972. A System for Visually Classifying Alfalfa Flower Color. U.S. Dep. Agric. Handb. 424. 18 pp. (Note: Greenish cast of plate 6, A and B is an artifact of printing, actual colors a blend of yellow and white.)

Elgin, J.H., Jr., (ed.). 1982. Standard Tests to Characterize Pest Resistance in Alfalfa Cultivars. U.S. Dep. Agric. Tech. Bull. (In Press).

Gunn, C.R., W.H. Skrdla, and H.C. Spencer. 1978. Classification of Medicago sativa L. using legume characters and flower colors. U.S. Dep. Agric. Tech. Bull. 1574. 84 pp.

Munsell Color Co. 1977. Munsell Plant Tissue Color Charts. Munsell Color Co., Inc. Baltimore.

NOTE: Any additional descriptive information and supporting documentation may be provided as Exhibit D.

8900229

Spring Vigor

1985 Iowa Forage Yield Evaluation

Ames, Iowa

	Spring Vigor*
Magnum III	2.34
Saranac	3.50
Vernal	4.08
Experimental mean	3.06
L.S.D. (0.05)	.45
C.V.	10.4

*Rated on 4/13/88

1 = Vigorous, few dead plants

5 = Weak, up to 40% of plants dead

IOWA TABLE 1. ALFALFA VARIETIES AND EXPERIMENTAL STRAINS

FIELD 2, 1985-88
LOCATION: 8 MILES WEST OF AMES — SOIL: CLARION NICOLLET, AND WEBSTER
DESIGN: 8 X 8 QUADRUPLE LATTICE — PLANTED: APRIL 17, 1985
PLOT SIZE: 3' X 12', 5 ROWS — CUTTINGS: 2 IN 1985, 4 IN 1986, 1987, AND 1988

			ADJUSTED YIELD OF DRY MATTER (T/A)								
		SPRING				1988					1985-88
ENTRY	SOURCE	VIGOR <1>	1985 <2>	1986 <3>	1987 <4>	5-24	6-28	8-2	9-23	TOTAL	AVERAGE
MAGNUM III	DAIRYLAND SEED CO.	2.34	2.81	7.78	8.51	2.72	2.41	1.61	1.21	7.95	6.76
S-105*	W-L RESEARCH, INC.	1.61	2.55	7.62	8.35	2.92	2.43	1.68	1.25	8.27	6.70
DS 504*	DAIRYLAND RESEARCH INTL.	2.24	2.74	7.57	8.05	2.66	2.44	1.68	1.28	8.05	6.60
MAGNUM+	DAIRYLAND SEED CO.	2.05	2.72	7.75	8.07	2.60	2.35	1.57	1.11	7.63	6.54
DS 512*	DAIRYLAND RESEARCH INTL.	2.70	2.86	7.64	8.12	2.53	2.20	1.60	1.14	7.48	6.53
APOLLO SUPREME	AGRIPRO	2.56	2.60	7.89	8.08	2.44	2.22	1.42	1.03	7.11	6.42
SPARTA	LAND O' LAKES, INC.	3.00	2.92	7.57	7.79	2.45	2.26	1.53	1.14	7.36	6.40
ANSTAR	NC+ HYBRIDS, INC.	2.25	2.90	7.61	7.89	2.44	2.15	1.46	1.16	7.22	6.40
WL 320<5>	FS SUPPLIES DIV. (GROWMARK)	2.84	2.82	7.31	7.92	2.36	2.34	1.68	1.13	7.52	6.39
5432	PIONEER HI-BRED INTL., INC.	2.26	2.76	7.65	7.94	2.62	2.17	1.37	1.04	7.22	6.39
ENDURE	CARGILL, INC.	2.94	2.88	7.48	7.94	2.46	2.11	1.45	1.13	7.15	6.36
CENTURION	AGWAY, INC. (ALLIED SEED)	3.33	2.91	8.06	8.02	2.14	1.94	1.31	1.00	6.39	6.34
526	PIONEER HI-BRED INTL., INC.	2.67	2.66	7.54	7.65	2.59	2.20	1.51	1.11	7.42	6.32
TOP TON	SUPERCROST	3.36	2.86	7.80	8.02	2.21	1.99	1.37	1.00	6.57	6.32
624<5>	GARST SEED CO.	2.48	2.85	7.31	7.85	2.41	2.15	1.49	1.11	7.18	6.30
ACTION	RESEARCH SEEDS, INC.	3.17	2.75	7.62	7.97	2.28	2.04	1.44	1.12	6.86	6.29
ARROW	NAPB	2.78	2.88	7.56	7.88	2.40	2.08	1.36	1.00	6.85	6.29
S-89-84*	W-L RESEARCH, INC.	2.48	2.52	7.33	7.94	2.51	2.12	1.50	1.06	7.19	6.25
NAPB 35*	AGRIPRO	2.67	2.82	7.67	7.89	2.29	1.99	1.27	0.93	6.49	6.22
MAGNUM	DAIRYLAND SEED CO.	2.88	2.94	7.40	7.69	2.40	2.09	1.34	0.95	6.80	6.21
ELEVATION	JACQUES SEED CO.	2.44	2.74	7.16	7.64	2.55	2.19	1.43	1.00	7.19	6.19
WA-2	WYFFELS HYBRIDS	2.52	2.67	7.22	7.81	2.40	2.22	1.42	1.02	7.05	6.19
NAPB 34*	AGRIPRO	3.15	2.68	7.62	7.96	2.31	2.01	1.20	0.98	6.48	6.19
HI-PHY	NC+ HYBRIDS, INC.	3.27	2.83	7.35	7.75	2.20	2.04	1.43	1.11	6.78	6.17
EDGE	RESEARCH SEEDS, INC.	3.09	2.78	7.68	7.80	2.15	1.92	1.35	0.99	6.42	6.17
SUMMIT	STAUFFER SEEDS, INC.	3.62	2.86	7.64	7.79	2.10	1.99	1.37	0.96	6.40	6.17
532	PIONEER HI-BRED INTL., INC.	2.28	2.72	7.06	7.63	2.35	2.21	1.54	1.15	7.25	6.16
PINNACLE	SEEDWAY, INC.	2.96	2.66	7.48	7.78	2.28	1.99	1.37	0.99	6.64	6.14
WA-1	WYFFELS HYBRIDS	2.99	2.60	7.23	7.57	2.35	2.10	1.49	1.15	7.09	6.13
SALUTE	UNITED AGRI. (LYNKS, HOFLER)	2.78	2.81	7.42	7.61	2.39	2.08	1.29	0.94	6.69	6.13
DART	AGRIPRO	3.07	2.72	7.46	7.63	2.33	1.98	1.33	1.05	6.69	6.12
SURE	CENEX/LAND O'LAKES	3.63	2.89	7.74	7.70	2.08	1.88	1.31	0.94	6.19	6.12
DK-135	DEKALB-PFIZER GENETICS	3.21	2.98	7.53	7.48	2.17	2.00	1.31	0.98	6.45	6.11
XAF31*	PIONEER HI-BRED INTL., INC.	2.78	2.80	7.38	7.54	2.22	2.01	1.37	1.06	6.67	6.10
SHIELD	GREAT LAKES HYBRIDS, INC.	3.26	2.92	7.58	7.52	2.02	1.96	1.37	1.00	6.36	6.10

IOWA TABLE 1. (CONTINUED)

ENTRY	SOURCE	SPRING VIGOR <1>	ADJUSTED YIELD OF DRY MATTER (T/A) 1985 <2>	1986 <3>	1987 <4>	1988 5-24	1988 6-28	1988 8-2	1988 9-23	1988 TOTAL	1985-88 AVERAGE
MAXIM	CENEX	2.82	2.65	7.46	7.92	2.14	1.93	1.30	0.98	6.35	6.10
NY 8412*	NEW YORK AES	3.15	2.62	7.24	7.69	2.39	2.07	1.37	1.01	6.84	6.09
HORIZON 85<6>	SIEBEN HYBRIDS, INC.	3.33	2.79	7.13	7.54	2.27	2.10	1.47	1.05	6.86	6.08
ADVANTAGE	DEKALB-PFIZER GENETICS	3.18	3.00	7.12	7.42	2.23	2.12	1.43	1.02	6.81	6.08
LL3409*	LAND O' LAKES, INC.	3.43	2.60	7.66	7.45	2.27	1.94	1.35	1.04	6.59	6.08
WL 316<5>	FS SUPPLIES DIV. (GROWMARK)	3.11	2.73	7.30	7.78	2.10	2.02	1.40	1.01	6.53	6.08
EXP.83631*	PRIDE CO., INC.	3.05	2.72	7.30	7.61	2.21	2.05	1.34	0.96	6.56	6.05
G-2852	FUNK SEEDS INTL.	3.78	2.99	7.50	7.58	1.95	1.89	1.31	0.99	6.14	6.05
FUTURA	DAIRYLAND SEED CO.	2.89	2.81	7.18	7.31	2.27	2.14	1.38	1.05	6.85	6.04
BELL RINGER	LOVELOCK SEED CO.	3.65	2.78	7.53	7.73	2.08	1.88	1.20	0.90	6.06	6.02
WL 221<5>	FS SUPPLIES DIV. (GROWMARK)	3.00	2.68	7.17	7.57	2.25	2.08	1.29	0.96	6.58	6.01
JUBILEE	NC+ HYBRIDS, INC.	3.45	3.01	7.08	7.31	2.14	1.98	1.42	1.06	6.59	6.00
PRESERVE	PRIDE CO., INC.	3.75	3.06	7.35	7.28	2.10	1.92	1.22	0.88	6.12	5.96
G-2818	FUNK SEEDS INTL.	3.06	2.66	7.09	7.47	2.16	2.04	1.32	0.99	6.51	5.94
BLAZER	LAND O' LAKES, INC.	3.18	2.53	7.54	7.37	2.33	1.88	1.23	0.88	6.31	5.94
G-2815	FUNK SEEDS INTL.	3.58	3.04	7.04	7.24	2.12	1.91	1.36	1.05	6.43	5.93
COMMANDOR	NORTHRUP KING CO.	2.91	2.58	7.13	7.49	2.33	1.95	1.22	0.92	6.43	5.91
629<5>	GARST SEED CO.	3.01	2.54	7.10	7.27	2.32	1.98	1.30	1.06	6.67	5.89
WL 315<5>	FS SUPPLIES DIV. (GROWMARK)	2.77	2.47	6.96	7.55	2.29	2.03	1.29	0.93	6.54	5.88
PH2121	AMERICANA SEEDS, INC.	3.30	2.78	6.97	7.28	2.21	2.07	1.29	0.94	6.50	5.88
SPECTRUM	CENEX	3.49	2.80	6.89	7.30	2.08	1.97	1.38	1.05	6.48	5.86
EAGLE	ASGROW / O'S GOLD	3.37	2.83	7.18	7.61	1.90	1.78	1.22	0.84	5.73	5.84
THOROBRED	LOVELOCK SEED CO.	3.65	2.94	7.19	7.18	1.88	1.73	1.21	0.94	5.76	5.77
SARANAC	NEW YORK AES (NY 79-12)	3.50	2.73	7.19	7.06	1.94	1.87	1.28	0.95	6.05	5.76
G-7730	FUNK SEEDS INTL.	3.58	2.83	7.08	7.11	2.04	1.91	1.17	0.84	5.96	5.75
120	DEKALB-PFIZER GENETICS	3.45	2.71	6.85	6.81	2.04	1.76	1.26	0.98	6.04	5.60
SARANAC AR	NEW YORK AES (NY 79-6)	3.90	2.72	6.97	7.04	1.80	1.81	1.17	0.93	5.71	5.60
VERNAL	WISCONSIN AES & USDA (VCC-78)	4.08	2.64	6.77	6.40	1.99	1.74	1.09	0.83	5.64	5.36
LOSAP	INTERNATIONAL SEEDS, INC.	5.04	2.55	6.54	5.67	1.07	1.32	0.93	0.60	3.93	4.67
EXPERIMENT MEAN		3.06	2.77	7.36	7.61	2.25	2.03	1.37	1.01	6.67	6.10
LEAST SIGNIFICANT DIFFERENCE (0.05)		0.45	0.24	0.31	0.41	0.15	0.22	0.21	0.17	0.60	0.29
COEFFICIENT OF VARIATION		10.4	6.0	3.0	3.9	4.8	7.8	10.7	11.9	6.4	3.4
RELATIVE EFFICIENCY OF LATTICE (%)		116	230	186	174	122	214	173	133	177	225

<1> Rated on 4/13/88: 1=Vigorous, few dead plants; 5=Weak, up to 40% of plants dead.
<2> Total of two harvests: July 1, August 6.
<3> Total of four harvests: May 22, June 25, July 26, September 6.
<4> Total of four harvests: May 19, June 22, July 28, September 11.
<5> Seed treated with Apron.
<6> Seed treated with Vitavax.
* Experimental Strain

Summary of Head-to-Head Comparison of Magnum III
From Wisconsin, Iowa, Minnesota, and Michigan over Four Years
(1985 - 1988)

Cultivar	% Check	No. of Harvests	States Tested	Persistence
Magnum III	111%	74	WI, IA, MN	76
Action	109%			49
Magnum III	112%	66	WI, IA, MN, MI	
Apollo Supreme	109%			
Magnum III	111%	90	WI, IA, MN, MI	76
Arrow	109%			61
Magnum III	112%	67	WI, IA, MN, MI	76
Centurion	111%			49
Magnum III	113%	37	WI, IA, MN	
Champ	110%			
Magnum III	109%	31	WI, IA	
Chief	108%			
Magnum III	112%	73	WI, IA, MN, MI	76
Commandor	104%			52
Magnum III	112%	51	WI, IA, MI	
DK 135	110%			
Magnum III	114%	57	WI, IA, MN	76
Edge	107%			37
Magnum III	112%	50	WI, IA, MN	76
Elevaton	108%			76
Magnum III	109%	49	WI, IA, MN, MI	
Endure	108%			

Summary of Head-To-Head Comparison of Magnum III, Cont'd.
From Wisconsin, Iowa, Minnesota, and Michigan over Four Years
(1985 -1988)

Cultivar	% Check	No. of Harvests	States Tested	Persistence
Magnum III	112%	56	WI, IA, MN	
Fortress	109%			
Magnum III	106%	32	WI, MN	
Garst 629	102%			
Magnum III	110%	53	WI, IA, MN, MI	76
Garst 636	107%			61
Magnum III	112%	79	WI, IA, MN, MI	76
G-2852	108%			31
Magnum III	114%	34	WI, IA, MN	
Impact	111%			
Magnum III	124%	2	IA	
Legend	119%			
Magnum III	112%	77	WI, IA, MN, MI	76
Pioneer 5432	106%			67
Magnum III	110%	25	WI, IA	
Pro-Cut	105%			
Magnum III	114%	52	WI, IA, MN	76
Shield	105%			52
Magnum III	114%	46	WI, IA, MN	76
Sparta	110%			64
Magnum III	111%	63	WI, IA, MN, MI	76
Summit	108%			40

Summary of Head-to-Head Comparison of Magnum III, Cont'd
From Wisconsin, Iowa, Minnesota, and Michigan over Four Years
(1985 -1988)

Cultivar	% Check	No. of Harvests	States Tested	Persistence
Magnum III	112%	62	WI, IA, MN, MI	76
Sure	110%			40
Magnum III	106%	18	MN	
Surpass	109%			
Magnum III	127%	28	WI, IA	76
Top Gun	116%			37
Magnum III	111%	90	WI, IA, MN, MI	76
Vernal	100%			49
Magnum III	109%	31	WI, IA	
WL 225	107%			
Magnum III	112%	48	WI, IA	76
WL 316	109%			49
Magnum III	111%	71	WI, IA, MN, MI	
WL 320	109%			
Magnum III	112%	24	WI, MN	
Wrangler	104%			

*Persistence = Percent ground cover from the 1985 Forage Yield Trial at the University of Wisconsin-Arlington Recorded 5/01/88.

EXHIBIT E

Magnum III was originated and developed by Paul Sun and Michael Velde, Company Plant Breeders. By agreement between employee and Dairyland Seed Company, all rights to any invention, discovery, or development made by an employee are assigned to the Company. No rights to such invention, discovery, or development are retained by the employee.