No. 7700013

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Northrup King Company

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 seventeen 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 (7 U.S.C. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

RED CLOVER

'Florex'

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* 18th *day of* May *in the year of our Lord one thousand nine hundred and* seventy-eight

Attest:

Acting

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

FORM GR-4 0
(1-76)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
PLANT VARIETY PROTECTION OFFICE
NATIONAL AGRICULTURAL LIBRARY
BELTSVILLE, MARYLAND 20705

FORM APPROVED
OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1a. TEMPORARY DESIGNATION OF VARIETY K8-115	1b. VARIETY NAME Florex	FOR OFFICIAL USE ONLY PV NUMBER 7700013
2. KIND NAME Red Clover	3. GENUS AND SPECIES NAME Trifolium pratense (L.)	FILING DATE 11-24-76 TIME 11:30 A.M. FEE RECEIVED $250.00 DATE 11-24-76 $250.00 10/5/77 $250.00 5/12/78
4. FAMILY NAME (BOTANICAL) Leguminosae	5. DATE OF DETERMINATION April, 1976	
6. NAME OF APPLICANT(S) Northrup, King & Co.	7. ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*) P. O. Box 959 Minneapolis, MN 55440	8. TELEPHONE AREA CODE AND NUMBER 612/781-8011
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 Minnesota	11. DATE OF INCORPORATION 1896

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

Allenby L. White
Northrup, King & Co.
P. O. Box 959
Minneapolis, Minnesota 55440

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? [X] YES [ ] NO

14C. If "Yes," to 14B, how many generations of production beyond breeder seed? Three [ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

15. Does the applicant(s) agree to the publication of his/her (their) name(s) and address in the Official Journal? [X] YES [ ] NO

16. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically 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.

November 19, 1976 (DATE) — Allenby L. White (SIGNATURE OF APPLICANT) 1

(DATE) — (SIGNATURE OF APPLICANT)

NORTHRUP, KING & CO.
1500 JACKSON ST., N.E., MINNEAPOLIS, MINN. 55413

7700013

FLOREX RED CLOVER

EXHIBIT A

Origin and Breeding History

In 1961, about one third of an acre of Dollard medium red clover was planted at the Northrup, King & Co. farm in Eden Prairie, Minnesota. This field was subjected to repeated mowing for a period of six years and was never allowed to reseed itself. The purpose of this rigorous regime was to eliminate plants which did not possess a high level of winter hardiness and resistance to endemic diseases.

At the end of six years, some 2,000 plants were selected from the surviving population. These plants were lifted by digging and the main root of each plant was cut and examined for disease symptoms. Healthy, non-diseased plants were planted in a spaced, polycross nursery.

Following further selection for desirable plant type, disease resistance and general persistence, Syn 1 seed was produced on the surviving plants in this nursery in 1968.

The Syn 1 seed was used to establish another nursery. Following a further selection, the plants in this nursery were allowed to cross pollinate at random and the resulting seed formed the pre-breeders seed for the new variety. Part of this seed was placed in long-term storage. The balance was used to produce breeders seed.

It is anticipated that the available breeders seed will last for the expected lifetime of the variety. However, should more breeders seed be needed, it can be produced from the stored pre-breeders seed.

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EXHIBIT B

Novelty Statement (Amended)

Florex is a diploid medium red clover which is most similar to Dollard, but differs from that variety in being later and having greater resistance to Northern Anthracnose, *Kabatiella caulivora*, Powdery Mildew, *Erysiphe polygoni* and generally greater persistence.

FORM GR-470-42
(9-77)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

Red Clover

OBJECTIVE DESCRIPTION OF VARIETY
RED CLOVER *(Trifolium Pratense)*

NAME OF APPLICANT(S)
Northrup King Company

VARIETY NAME OR TEMPORARY DESIGNATION
Florex

ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code)*
1500 Jackson Street N.E.
Minneapolis, MN. 55413

FOR OFFICIAL USE ONLY
PVPO NUMBER
7700013

Place the appropriate number that describes the varietal character of this variety in the boxes below. Fill unused columns with zeros (e.g. [0|9|9] when number is 99). In comparisons to standard varieties, the value [0|0] 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: _____. Give location of test area _____. 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 = DOUBLE CUT (medium) 2 = SINGLE CUT (mammoth) 3 = OTHER *(Specify)* _____

2. PLOIDY:

[1] 1 = DIPLOID 2 = TETRAPLOID 3 = OTHER *(Specify)* _____

3. PRODUCTIVE PERSISTENCE (Usual duration of planting):

[3] 1 = ANNUAL 2 = BIENNIAL 3 = SHORT LIVED PERENNIAL (3 - 4 Years)

4. ADAPTATION: (e.g., [0|2|3] = northcentral and southcentral)

[0|1|2] 1 = NORTHEAST 2 = NORTHCENTRAL 3 = SOUTHCENTRAL
4 = SOUTHEAST 5 = WEST 6 = OTHER *(Specify)* _____

STANDARD VARIETIES

1 = KENSTAR 2 = ARLINGTON 3 = PENNSCOTT 4 = TENSAS 5 = ALTASWEDE 6= Dollard

5. MATURITY:

[| |] % PLANTS FLOWERING IN SEEDLING YEAR

Beginning of spring growth:

[|] DAYS EARLIER THAN . . . . . [ ] STANDARD VARIETY

[|] DAYS LATER THAN . . . . . [ ] STANDARD VARIETY

Time of flowering (50% of plants in bloom): (from spring growth in non-seedling year)

[|] DAYS EARLIER THAN [ ] STANDARD VARIETY

[0|2] DAYS LATER THAN [6] STANDARD VARIETY

6. PLANT HEIGHT (from soil level to top of flowering head at 50% flowering)

[6|0] CM. TALL [0|3] CM. SHORTER THAN [6] STANDARD VARIETY

[|] CM. TALLER THAN [ ] STANDARD VARIETY

INSTRUCTIONS

GENERAL: Send an original copy of the application, exhibits and $250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, National Agricultural Library, 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 commerical 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 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.

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 or published or the certificate has been issued. However, if the applicant specifies "NO", he may change his choice. (See Section 180.15 of the Regulations and Rules of Practice.)

7. FLOWERING STEM (from first noncontracted internode, longer than 0.5 cm., to tip of flowering head):

[ ][ ] NO. FLOWERING STEMS PER CROWN

[ ][ ] NO. INTERNODES

[ ][ ] CM. LENGTH OF STEM

Hairiness: Give percentage of plants with each type of surface (Total = 100%)

[1][0][0] % HAIRS PROJECTING UPWARD

[ ][ ][0] % HAIRS PROJECTING DOWNWARD OR AT RIGHT ANGLES

[ ][ ][0] % GLABROUS (FEWER THAN 5 HAIRS/1 CM. PATH ALONG CENTRAL INTERNODES)

Habit: Give percentage of plants with each type of habit. Stem habit should be determined by the angle of lowest stems to the horizontal (soil level) at 50% flowering.

[ ][1][3] % PROSTRATE *(0 - 30°)* [ ][3][1] % SEMI-PROSTRATE *(30 - 45°)* [ ][5][4] % SEMI-ERECT *(45 - 60°)* [ ][ ][2] % ERECT *(60 - 90°)*

8. LEAF (Central leaflet at 3rd node below flowering head):

[ ][ ] MM WIDTH

[ ][ ] MM NARROWER THAN ..... [ ] STANDARD VARIETY

[ ][ ] MM WIDER THAN ..... [ ] STANDARD VARIETY

[ ][ ] MM LENGTH

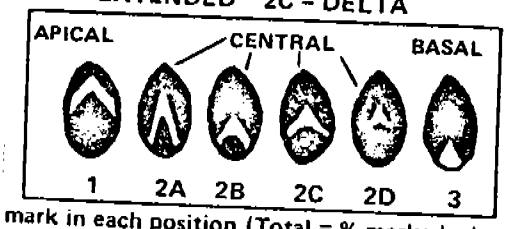
[ ][ ] MM SHORTER THAN ..... [ ] STANDARD VARIETY

[ ][ ] MM LONGER THAN ..... [ ] STANDARD VARIETY

Color:

[2] 1 = LIGHT GREEN *(Altaswede)* 2 = MEDIUM GREEN *( )* 3 = DARK GREEN *(Hungaropoli)* 4 = BLUE GREEN *( )*

Leaf Marking (at 50% flowering): NOTE: Categories below allow for increasingly detailed description of the same data. Diagram illustrates terms: 1 = APICAL 2A = FULL 2B = EXTENDED 2C = DELTA 2D = INCOMPLETE 3 = BASAL



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

[ ][8][5] % ABSENT [ ][1][5] % MARKED

Position of Mark: Of total plants, give percentage with leaf mark in each position (Total = % marked, above)

[ ][ ][1] % APICAL [ ][1][4] % CENTRAL [ ][ ][0] % BASAL

Shape of Mark: Of total plants, give percentage with central leaf marks having each shape (Total = % central above)

[ ][ ][ ] % FULL [ ][ ][ ] % EXTENDED [ ][ ][ ] % DELTA [ ][ ][ ] % INCOMPLETE

9. FLOWER COLOR (Determine color on freshly opened florets): Give percentage of plants with each color (Total = 100%). Colors are referenced to the Munsell Color System.

[ ][ ][2] % WHITE

[ ][3][4] % LIGHT PINK (5RP 8/4)

[ ][1][4] % MEDIUM PINK (5RP 7/6)

[ ][4][9] % DARK PINK (5RP 6/8)

[ ][ ][1] % RED (5RP 5/10)

[ ][ ][ ] % OTHER *(Specify)* _____

10. SEED COLOR: Maximum color development in unstored, mature seed (at beginning of calyx browning). Give percentage of plants with each seed color (Total = 100%)

019	% YELLOW	026	% YELLOW WITH SOME PURPLE
007	% PURPLE	048	% PURPLE WITH SOME YELLOW
	% OTHER *(Specify)* _____		*(attach explanation)*

11. DISEASE AND INSECT RESISTANCE (0 = 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, date and location of test, and range and direction of test scores.

A. DISEASES:

0	CROWN ROT *(Sclerotina trifoliorum)*	0	ROOT ROT *(Fusarium spp.)*
2	NORTHERN ANTHRACNOSE *(Kabatiella caulivora)*	0	SUMMER BLACK STEM *(Cercospora zebrina)*
1	SOUTHERN ANTHRACNOSE *(Colletotrichum trifolii)*	0	BLACK STEM *(Phoma trifolii)*
0	TARGET SPOT *(Stemphylium sarcinaeformae)*	2	POWDERY MILDEW *(Erysiphe polygoni)*
0	PEPPER SPOT *(Leptosphaeralina trifolii)*	1	BLACK PATCH *(Rhizoctonia leguminicola)*
0	RED CLOVER VEIN MOSIAC VIRUS	0	BEAN YELLOW MOSIAC VIRUS
0	NEMATODE *(Specify)* _____	1	OTHER *(Specify)* Rust (Uromyees Trifolii)

B. INSECTS:

1	CLOVER ROOT BORER *(Hylastinus obsurus)*	0	CLOVER ROOT CURCULIO *(Sitona hispidula)*
0	SWEETCLOVER WEEVIL *(Sitona cylindricollis)*	0	CLOVER SEED CHALCID *(Bruchophagus platyptera)*
0	LESSER CLOVER LEAF WEEVIL *(Hypera nigrirostris)*	2	POTATO LEAF HOPPER *(Empoasca fabae)*
0	YELLOW CLOVER APHID *(Therioaphis trifolii)*	0	MEADOW SPITTLE BUG *(Philaenus spumarius)*
0	CLOVER SEED MIDGE *(Dasineura leguminicola)*	0	PEA APHID *(Acrythosiphon pisum)*
0	CLOVER LEAFHOPPER *(Aceratagallia sanguinolenta)*		OTHER *(Specify)* _____

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

CHARACTER	VARIETY	CHARACTER	VARIETY
LEAFLET SHAPE	Dollard	SEED COLOR	Kenland
CUTTING RECOVERY	Dollard	LATE SEASON GROWTH	Dollard
WINTER HARDINESS	Dollard	PERSISTENCE	more persistant than any standard variety

REFERENCES:

Hawkins, R. P. 1953. Investigations on local strains of herbage plants II. Types of red clover and their identification. J. Brit. Grassland Soc. 8, 213-218.

Williams, R. D. 1927. Red clover investigations, 1919 - 1926. Welsh Plant Breeding Station Bull., Ser. H. No. 7.

COMMENTS: (If additional space is necessary, use reverse side)

NORTHRUP, KING & CO.
1500 JACKSON ST., N.E., MINNEAPOLIS, MINN. 55413

7700013

OBJECTIVE DESCRIPTION OF VARIETY

Exhibit C

1. KIND

[1] 1. Medium 2. Mammoth Ploidy [1] 1. Diploid 2. Tetraploid

2. PLANT HABIT

[1] Type 1. Determinate 2. Indeterminate

3. PLANT HEIGHT

[60] Cm Tall

[ ] Cm Taller Than (shorter than all checks)

[3] Cm Shorter Than Dollard

4. STEM HABIT

[2] % Erect

[54] % Semi-erect

[31] % Semi-prostrate

[13] % Prostrate

5. STEMS PER CROWN

[3] 1. 1 to 6

2. 7 to 12

3. More than 12

6. STEM HAIRINESS

[2] 1. Glabrous 2. Pubescent

7. STEM COLOR AT CROWN

[17] % Red

[49] % Red and Green

[34] % Green

8. LEAF SHAPE MARKINGS (% in each category)

[85] % None

[1] % Apricot

[9] % Delta

[3] % Extended

[2] % Full

9. LEAF HAIRINESS

[2] 1. Glabrous 2. Pubescent

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EXHIBIT C
OBJECTIVE DESCRIPTION OF VARIETY

7700013

10. FLOWER COLOR

[2] % White

[35] % Light Pink

[14] % Pink

[37] % Bluish Pink

[11] % Reddish Pink

[1] % Red

11. TIME OF BLOOM

[2] 1. Early 2. Medium 3. Late

[ ] Days Earlier Than _____

[2] Days Later Than Dollard

12. SEED COLOR

[19] % Yellow

[26] % Light Bi-color

[48] % Dark Bi-color

[7] % Dark Violet

13. DISEASE RESISTANCE

0 = Not Tested 1 = Susceptible 2 = Resistant

[0] Crown Wart	[0] Phoma	[0] Cercospora	[0] Cymodothea
[0] Sclerotinia rot	[0] Pythium	[0] Pseudopeziza	[2] Erysiphe
[0] Fusarium	[2] Northern Anthracnose	[0] Stemphyllium	[1] Rust (Wisc.)
[0] Rhizoctonia	[1] Southern Anthracnose	[1] Black Patch (Kent)	[2] Virus

14. INSECT RESISTANCE

0 = Not Teated 1 = Susceptible 2 = Resistant

[1] Root Borer	[0] Chalcid Fly	8 [0] Clover Leafhopper
[0] Root Curculio	[2] Potato Leafhopper	[0] Clover Flower Midge

15. INDICATE A VARIETY WHICH MOST CLOSELY RESEMBLES THAT SUBMITTED

Character:	Variety
Leaflet Shape	Dollard
Seed Color	Kenland
Seedling Vigor	-------
Spring Growth	Dollard
Winter Hardiness	Dollard
Cutting Recovery	Dollard
Late Season Growth	Dollard
Stem Habit	--------
Flowering Date (50% Bloom)	Dollard
Flower Color	Dollard

EXHIBIT D

Additional Description of the Variety

7700013

I. Seed Color

Variety	PERCENT OF SEEDS			
	Yellow	Light Bi-Color	Dark Bi-Color	Dark Violet
Florex	19	26	48	7
Dollard	13	21	58	8
Lakeland	14	29	52	5
Arlington	18	34	43	5
Kenland	17	29	49	5
Kenstar	31	45	23	<1

II. Plant

A. Growth Habit

Variety	Percent of Plants			
	Erect	Semi-Erect	Semi-Prostrate	Prostrate
Florex	2	54	31	13
Lakeland	42	40	16	2
Kenland	40	43	16	1

B. Stems

1. Stem Color at Crown

Variety	Percent of Plants		
	Red	Red-Green	Green
Florex	17	49	34
Lakeland	10	41	49
Kenland	2	59	39

2. Stem Number per Plant

Variety	Percent of Plants		
	1-6	7-12	More than 12
Florex	8	26	66
Lakeland	8	24	68
Kenland	15	41	44

C. Leaves

Variety	% of Plants with Marked Leaves
Florex	15
Lakeland	75
Kenland	85

10

D. Flower Color

Variety	PERCENT OF PLANTS					
	White	Light-Pink	Pink	Reddish-Pink	Bluish-Pink	Red
Florex	2	35	14	37	11	1
Lakeland	0	9	16	59	8	8
Kenland	0	3	23	63	0	11

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III. Agronomic Data

A. Yield and Persistence Data - In % of checks
Northrup King Yield Trials

Variety	Norwood, Minnesota Yr. 1	Norwood, Minnesota Yr. 2	Stanton, Minnesota Yr. 1 1/	Stanton, Minnesota Yr. 2	Washington, Iowa Yr. 1 2/	Washington, Iowa Yr. 2 2/
Florex	95	126	100	117	97	129
Dollard	97	111	103	96	96	113
Lakeland	110	103	97	104		
Kenland	97	91			100	100
C.V.	7.6	8.2	5.1	8.7	6.8	19.0

1/ Average of 3 trials seeded in 1971, 1973, and 1974.
2/ Average of 2 trials seeded in 1971, and 1973

Experiment Station Trials

Variety	Marshfield, WI Yr. 1	Marshfield, WI Yr. 2	Lacombe, Alberta Yr. 1	Lacombe, Alberta Yr.2	Universite, Loval Yr. 1	Universite, Loval Yr. 2
Florex	107	105	118	203	125	120
Lakeland	101	94			111	84
Dollard	99	105			108	96
Ottawa			100	100	100	100
C.V.	4.5		11	10	5.7	9.7

B. Plant Height

Variety	Height in cm 1st cut 6-17-75	Stanton, MN Regrowth 7-25-75
Florex	60	30
Lakeland	62	32
Kenland	69	38
Dollard	63	33

C. Disease Resistance 1=clean 9=severe

Variety	Northern Anthracnose Minn.	Northern Anthracnose Wisc.	Mildew Wisc.	Mildew Kentucky
Florex	1.0	1.1	1.5	3.0
Dollard	2.6	2.0	5.0	
Lakeland	1.5	1.8	2.0	3.5
Kenland	7.3	3.6	9.0	6.6
Kenstar	7.0	2.8	8.8	5.8

Florex is susceptible to rust, black patch, and southern anthracnose.

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EXHIBIT D
ADDENDUM

III. Agronomic Data

D. Bloom Dates - Stanton, Minnesota

Variety	(1)	(2)	(3)	(4)
Florex	13.7	13%	20.0%	33.8%
Kenstar	10.7	22	67.0	-----
Lakeland	12.0	10	27.5	36.3
Dollard	10.3	15	27.5	43.8
Arlington				43.8
LSD .05	2.1	NS	No analysis made	9.8
C.V.	9.8			15.7

(1) Days after June 1, 1975, reaching 80% bloom in a 3 replicate yield trial. This is prior to first cut.

(2) Percent of bloom on July 25, 1975, prior to second cut.

(3) Percent of bloom on September 23, 1975, prior to third cut.

(4) Percent of bloom on May 31, 1977, just prior to first cut.

NORTHRUP KING CO.
1500 JACKSON STREET N.E., MINNEAPOLIS, MN 55413

Seedsmen since 1884

ALLENBY L. WHITE - VICE PRESIDENT RESEARCH & MARKET DEVELOPMENT

TELEX 29-0143
TWX 910-576-3420
PHONE 612-781-8011

Mr. Larry W. Dosier, Examiner
Plant Variety Protection Office
U.S. Department of Agriculture
National Agricultural Library Building
Beltsville, Maryland 20705

February 21, 1978

Subject: APPLICATION NO. 7700013, RED CLOVER, "FLOREX"

Dear Mr. Dosier:

Thank you for your letter of September 19 on the above subject.

Exhibit C

We are enclosing a completed copy of the amended Exhibit C form.

Exhibit A

There are no known variants in Florex red clover aside from those referred to in Exhibit C and, more particularly, those referred to in Tables I and II of Exhibit D.

Florex red clover is stable. This variety has been under test and generation increase since 1970. During that time, we have carefully observed it for stability, taking special notice of morphological characteristics, such as leaf markings and stem color, and, more importantly, the physiological character of persistence. Red clovers, unless very carefully maintained, tend toward instability in large part because of their lack of persistence. This lack of persistence of some plants in the population can, if not carefully controlled through good maintenance breeding programs and cultural practices, cause a varietal shift over the course of some generations of multiplication. In the case of Florex, we have carefully selected for persistence. This character coupled with the fact that we have produced enough breeder seed for the expected life of the variety eliminates the need for a maintenance breeding program and for repeated regeneration of the variety, thus insuring the stability of the variety.

The allusion to selection for "desirable plant type" in the third paragraph of Exhibit A is meant to convey that, even though relatively fixed as to plant type, the population prior to the production of Syn 1 seed still contains some plants considered undesirable. That is, the selection

NOTICE: Northrup King Co. warrants that seeds sold have been labeled as required under State and Federal Seed Laws and that they conform to the label description. No liability hereunder shall be asserted unless the buyer or user reports to the warrantor within a reasonable period after discovery (not to exceed 30 days), any conditions that might lead to a complaint. OUR LIABILITY ON THIS WARRANTY IS LIMITED IN AMOUNT TO THE PURCHASE PRICE OF THE SEEDS.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE HEREOF.

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for "desirable plant type" actually consisted of removing from the population undesirable types, such as plants without the sought-for leafiness, plants showing disease symptoms which could make the variety less persistent, plants with coarse stems, etc. This discrimination between "desirable" and "undesirable" plant types is, in part, a subjective one, the end objective of which is to produce a variety possessing those characteristics originally targeted by the breeder.

The term "following a further selection" in the fourth paragraph is meant to convey that the process referred to above was once more carried out with the objective being the production of pre-breeders seed having all of the desired qualities. No further selection is made by the breeder following the production of pre-breeders seed.

Exhibit B

You ask whether the three centimeter height difference claimed as a difference between Florex and Dollard red clover can be demonstrated statistically. The breeder of Florex states that the 3 cm difference noted in III B of Exhibit D for both first cut and regrowth is real and that his data for this trial indicates that a difference of 1.8 cm is significant. He points out, however, that this trial does not take differences in flowering date into account. While he has observed this difference even when both varieties have reached the same stage of bloom, we have no data to offer demonstrating a difference at this stage, so are therefore willing to drop the claim for "being shorter."

You further ask whether the two days earlier bloom cited in Exhibit C can be statistically verified. We do have data to support this claim and offer this as an addition (III D) to Exhibit D. You will find this amendment attached.

For the above reasons, we propose to drop the claim "being shorter" in Exhibit B, substituting for it "being later" and we are attaching an amended Exhibit B in which this change has been made.

The data in Exhibit D on which we base our claim for Northern anthracnose resistance (see III C) occurs under the column, "Minn." As noted in the explanatory note accompanying this table, a rating of 1 = clean and a rating of 9 = severe. The L.S.D. at the .05 level for the trial was 1.5, which was statistically significant.

We have no statistical verification for the powdery mildew data for Wisconsin and Kentucky since these were not our own trials. Dollard was not included in the Kentucky trial since it is considered an unadapted variety there. We could set up a replicated, spaced-plant trial this spring to make this determination.

NORTHRUP, KING & CO.
1500 JACKSON ST., N.E. MINNEAPOLIS, MINN. 55413

We understand your reluctance to accept a novelty claim for persistence because of the generality of this claim, and yet this is a truly remarkable feature of Florex. The data in Exhibit D (III A) are representative of the results we have obtained with this variety. We recognize that "persistence" is the product of other characteristics and that a recitation of these characteristics should, in sum, suggest persistence. The problem lies in the fact that red clover breeders are uncertain, or do not agree, on what makes up persistence. Most agree that a not-well-understood complex of diseases (often complicated by the eventual intrusion of saprophytic organisms) is involved, but, excepting for reaction to some of the better understood diseases (e.g. anthracnose and powdery mildew) referred to in our Exhibit D data, it is difficult to demonstrate persistence other than by providing data which demonstrates that a given variety, and for whatever reasons, does, in fact, live longer and maintains stands better than other varieties. We are in something of a quandary. We believe that persistence is a easily seen and clearly differentiating feature of Florex and that we might be remiss in not pointing out this novel feature. We would appreciate your guidance on this matter.

Sincerely,

NORTHRUP KING CO.

Allenby L. White

sam
Enclosures

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