No. 7700102

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

North Carolina Foundation Seed Producers, 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 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, 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. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

OAT

'Firecracker'

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-470 (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: NC 1373-1	1b. VARIETY NAME: Firecracker	FOR OFFICIAL USE ONLY — PV NUMBER: 7700102
2. KIND NAME: Oat	3. GENUS AND SPECIES NAME: Avena sativa	FILING DATE: 8-11-77 — TIME: 3:30 ~~A.M.~~ P.M.
4. FAMILY NAME (BOTANICAL): Gramineum	5. DATE OF DETERMINATION: August 23, 1976	FEE RECEIVED: $250.00 / $250.00 / $250.00 — DATE: 8-1-77 / 8-11-77 / 4-18-78
6. NAME OF APPLICANT(S): North Carolina Agricultural Experiment Station	7. ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*): North Carolina State University, School of Agriculture and Life Sciences, Agricultural Experiment Station, Box 5847, Raleigh, N. C. 27607	8. TELEPHONE AREA CODE AND NUMBER: 919-737-2717
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (*Corporation, partnership, association, etc.*): Public Institution	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION

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

R. W. McMillen, Manager
N. C. Foundation Seed Producers, Inc.
P. O. Box 5687
State University Station
Raleigh, North Carolina 27607

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.)* [X] YES [ ] 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? [X] FOUNDATION [X] REGISTERED [X] 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.

8-27-76
(DATE)

Kenneth R. Keller
(SIGNATURE OF APPLICANT)

1

(DATE)

(SIGNATURE OF APPLICANT)

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.)

PROPOSAL TO

N. C. STATE BREEDERS RELEASE BOARD

FOR

N. C. 1373-1 OAT

PROPOSED NAME: Firecracker

PROPOSED RELEASE: July 4, 1976

Firecracker Oats

The oat line proposed for release under the name, "Firecracker," has been tested as N.C. 1373-1 and is listed in the World Oat Collection as C.I. 9224. It was derived from the cross Carolee x T.F. 1012. Carolee is a widely grown release from this station and T.F. 1012 is a French line which was obtained from Dr. K. J. Frey at Iowa State University for its very good straw strength. The cross was made in 1968 with the final selection (a single F_3 panicle) having been made in 1970.

N.C. 1373-1 has been tested for three years at the Piedmont Research Station (Rowan Co.), the Central Crops Research Station (Clayton) and the Mountain Research Station (Waynesville). It was tested in the coastal plains in the 1974 and 1975 North Carolina Official Variety Tests. Results are attached.

The breeding history of this line is somewhat unusual, as is the line itself. Because of the unique appearance of some of the plants from the cross, a few individual F_3 heads were harvested and increased. N.C. 1373-1 resulted from one of these F_3 selections as did a sister selection, N.C. 1373-2, which has been similarly tested. Both lines proved to be quite uniform and N.C. 1373-1 was also very early and showed excellent yield potential.

The cross of Carolee x T.F. 1012 has produced some very interesting material and it is being used extensively in the oat breeding program. A number of lines from this cross are in yield tests but anything else which might be considered for release is four years behind N.C. 1373-1. All of this material has excellent straw and a very characteristic panicle type. While many very stiff strawed oats are plagued by large hull percentages and relatively small numbers of seeds/panicle,

these lines have very large numbers of seeds/panicle, relatively small seeds and rather low hull percentages. They do tend, however, to lack both winterhardiness and crown rust resistance. A major objective of the oat breeding program is to incorporate more winterhardiness into this basic type. Crown rust is not a serious problem in North Carolina but becomes a problem further south.

Because N.C. 1373-1 lacks both winterhardiness and crown rust resistance, it is anticipated that its area of adaptation would be the coastal plains of North Carolina and Virginia. It would not be recommended for the piedmont. It is anticipated, though, that this line could prove to be quite important in the coastal plains (especially in double cropping situations) because of its excellent yield potential and early maturity. The new variety Salem also offers excellent yield potential but it is considerably later in maturity.

There is some national effort to identify varietal releases with the Bicentennial and the name "Firecracker" and the July 4 release date are, of course, proposed with this in mind. The new releases, Boone barley and Salem oats, are now being produced by certified growers and will be available for sale to farmers during the summer of 1976. Mr. McMillen is increasing approximately 230 bushels of "Firecracker" which would allow for a plentiful sale to certified growers during the summer of 1976.

EXHIBIT A - FIRECRACKER OAT

(Supplement)

Statement of Stability

The variety is uniform and stable. No variants have been observed.

EXHIBIT B - FIRECRACKER OAT

Characteristics	*Salem*	*Firecracker*
Panicles	*Midsize*	*Small*
Floret Separation	*Disarticulation*	*Heterofracture*
Lemma Color	*Red*	*Yellow*
Lemma Shape	*Midplump*	*Slender to Midplump*
Length of Second Rachilla Segment	*Midlong to Long*	*Long*
Awns	*Common -- Twisted and Subgeniculate*	*Absent*

We don't know of any particular variety "most similar" to Firecracker, but we believe 'Salem' is as similar as exists.

FORM APPROVED: OMB NO. 40-R3712

FORM GR-470-35
(1-76)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF VARIETY
OAT
(Avena spp.)

NAME OF APPLICANT(S)
North Carolina Agricultural Experiment Station

VARIETY NAME OR TEMPORARY DESIGNATION
Firecracker

ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code)
North Carolina State University
School of Agriculture & Life Sciences, Agri. Exp. Sta.
Box 5847, Raleigh, North Carolina 27607

FOR OFFICIAL USE ONLY
PVPO NUMBER
7700102

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less.

1. SPECIES:

[1] 1 = SATIVA 2 = BYZANTINA 3 = OTHER (Specify)_____

2. GROWTH HABIT:

[2] 1 = WINTER 2 = SEMIWINTER 3 = SPRING

[2] JUVENILE GROWTH: 1 = PROSTRATE 2 = SEMIPROSTRATE 3 = ERECT

STANDARD VARIETIES

1 = JAYCEE 2 = CLINTLAND 64 3 = CAYUSE 4 = NORLINE 5 = YANCEY 6 = FLORIDA 501

3. MATURITY (50% flowering): (Not Applicable)

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

[ ] Season: 1 = VERY EARLY (Jaycee) 2 = EARLY (Nodaway 70) 3 = MIDSEASON (Clintford)
4 = LATE (Lodi) 5 = VERY LATE (Garry) 6 = EXTREMELY LATE (Mackinaw)

4. PLANT HEIGHT (From soil level to top of head): (Not Applicable)

[0][8][9] CM. TALL

[ ][ ] CM. SHORTER THAN .... [ ] STANDARD VARIETY
[ ][ ] CM. TALLER THAN ..... [ ] STANDARD VARIETY

5. STEM:

[2] DIAMETER: 1 = FINE (Kherson) 2 = MEDIUM (Clintford) 3 = COARSE (Nodaway 70)

[1] HAIRINESS AT UPPER CULM NODES: 1 = HAIRLESS 2 = HAIRY

[1] MATURE STEM COLOR: 1 = YELLOW 2 = REDDISH

6. LEAF: (Leaf Color: The Royal Horticultural Society's or any recognized color chart should be used to determine the leaf color of the described variety.)

[ ] CARRIAGE: 1 = DROOPING (Random) 2 = ERECT (Walken)

[ ] COLOR: 1 = YELLOW GREEN 2 = LT. GREEN 3 = DK. GREEN 4 = BLUE GREEN

[ ][ ] MM. WIDTH (First leaf below flag leaf) [1] LEAF MARGIN: 1 = GLABROUS 2 = CILIATE

[2] LIGULE: 1 = ABSENT 2 = PRESENT [1] LEAF SHEATH: 1 = HAIRLESS 2 = HAIRY

7. HEAD:

[1] PANICLE SHAPE: 1 = EQUILATERAL 2 = INTERMEDIATE 3 = SIDE PANICLE (Unilateral)

[ ] ATTACHMENT OF LOWER WHORL OF BRANCHES: 1 = FIRST NODE 2 = SECOND NODE (False node)

[1] PANICLE SIZE: 1 = SMALL (Yancey) 2 = MEDIUM (Walken) 3 = LARGE (Markton)

[2] PANICLE WIDTH: 1 = NARROW (Gopher) 2 = MIDBROAD (Yancey) 3 = BROAD (Nodaway 70)

[ ][ ] CM. PANICLE LENGTH [ ][ ] NUMBER OF BRANCHES [ ][ ] NUMBER OF WHORLS OF BRANCHES

[1] POSITION OF BRANCHES: 1 = ASCENDING (Yancey) 2 = SPREADING (Cayuse) 3 = DROOPING (Markton)
4 = PECTINATE (White Tartar) 5 = CONFUSED (Storm King)

Table I. Yield of N.C. 1373-I and selected check varieties at Clayton, Rowan Co. and O.V.T. Coastal Plains test (bu/A.)

Clayton

Variety	1973	1974	1975	1976	$\bar{x}$
N.C. 1373-I	43.4	29.6	26.9	52.1	38.0
Carolee	35.0	42.6	17.6	26.7	30.5
Salem	24.9	31.8	9.5	42.3	27.1
Coker 66-22	47.5	61.6	28.8	24.9	40.7
Coker 227	--	--	23.0	48.0	

Rowan Co.

Variety	1973	1974	1975	1976	$\bar{x}$
N.C. 1373-I	7.2	101.2	104.2	62.0	68.7
Carolee	41.4	82.3	94.4	73.4	72.9
Salem	69.7	86.4	100.2	61.1	79.4
Coker 66-22	31.2	78.9	97.4	38.8	61.6
Coker 227	--	--	98.4	84.7	

O.V.T. -- Coastal Plains

Variety	1974	1975	1976	$\bar{x}$
N.C. 1373-I	104.1	105.1	97.5	102.2
Carolee	100.8	106.1	91.9	99.6
Salem	114.5	111.4	89.7	105.2
Coker 227	108.1	97.4	96.0	100.5

Table 2. Test weight of N.C. 1373-1 and selected check varieties at Clayton and Rowan Co. (lbs/bu.)

Clayton

Variety	1973	1974	1975	1976	$\bar{x}$
N.C. 1373-1	29.0	33.7	25.8	29.0	29.4
Carolee	25.6	33.8	27.5	31.0	29.5
Salem	23.9	35.5	26.0	29.6	28.8
Coker 66-22	20.4	35.4	26.7	27.9	30.1
Coker 227			21.0	31.3	

Rowan Co.

Variety	1973	1974	1975	1976	$\bar{x}$ 1/
N.C. 1373-1	--	33.5	32.7	36.0	34.1
Carolee	29.0	33.7	30.6	36.7	33.7
Salem	31.0	36.0	33.8	36.5	35.4
Coker 66-22	32.0	34.9	35.2	35.6	35.2
Coker 227			35.0	35.6	

Table 3. Heading date of N.C. 1373-1 and selected check varieties.

	Clayton				
Variety	1973	1974	1975	1976	$\bar{x}$
N.C. 1373-1	4/28	4/20	4/24	4/14	4/22
Carolee	4/28	4/22	5/3	4/18	4/25
Salem	5/2	4/22	4/30	4/18	4/26
Coker 66-22	4/28	4/18		4/20	
Coker 227			4/28	4/16	

Table 4. Plant height (in.) of N.C. 1373-1 and selected check varieties

	Clayton	Rowan Co.			
Variety	1973	1974	1975	1976	$\bar{x}$
N.C. 1373-1	34	38	41	26	35
Carolee	35	42	43	31	38
Salem	34	44	44	28	38
Coker 66-22	34	43	48	33	40
Coker 227			41	27	

Table 5. Maturity date of N.C. 1373-1 and selected check varieties.

	Clayton
Variety	1976
N.C. 1373-1	5/23
Carolee	5/26
Salem	5/26
Coker 66-22	5/31
Coker 227	5/25

Table 6. Percent survival of N.C. 1373-1 and selected check varieties.

Variety	Rowan Co. 1973	Waynesville 1973	Waynesville 1974	Waynesville 1975	Waynesville 1976	$\bar{x}$
N.C. 1373-1	5	0	60	45	0	22
Carolee	95	0	85	75	20	55
Salem	100	5	70	50	25	50
Coker 66-22	100	80	95	60	85	84
Coker 227				85	75	

Table 7. Percent soil-borne mosaic of N.C. 1373-1 and selected check varieties.

Variety	Clayton 1974	Rowan Co. 1974	Rowan Co. 1975	Rowan Co. 1976	Clayton 1976	$\bar{x}$
N.C. 1373-1	20	35	85	50	20	42
Carolee	40	60	60	50	30	48
Salem	30	30	55	55	50	44
Coker 66-22	20	15	35	35	40	29
Coker 227			30	45	20	

OCT 03 1977

8. RACHIS:

[2] 1 = RECURVED (Yancey) 2 = ERECT (Walken)

[3 0] MM. SECOND FLORET RACHILLA SEGMENT LENGTH

[1] SECOND FLORET RACHILLA SEGMENT: 1 = HAIRLESS 2 = HAIRY

[ ] RACHILLA HAIRS: 1 = SHORT 2 = LONG

9. SPIKELET:

[3] SPIKELET SEPARATION BY: 1 = ABSCISSION 2 = SEMIABSCISSION 3 = FRACTURE

[2] FLORET SEPARATION BY: 1 = DISARTICULATION 2 = HETEROFRACTURE 3 = BASIFRACTURE

[ ] FLORETS PER SPIKELET (mean no.)

10. GLUMES: (Glume Color: The Royal Horticultural Society's or any recognized color chart should be used to determine the color of the described variety.)

[ ] MM. WIDTH [ ] MM. LENGTH [ ] NO. OF VEINS ON GLUMES [ ] COLOR: 1 = WHITE 2 = YELLOW 3 = RED 4 = STRIPED

11. LEMMA: (Lemma Color: The Royal Horticultural Society's or any recognized color chart should be used to determine the color of the described variety.)

[1 4] MM. LENGTH

[2] COLOR: 1 = WHITE 2 = YELLOW 3 = RED 4 = GRAY 5 = BLACK

[1] HAIRINESS OF DORSAL SURFACE: 1 = HAIRLESS 2 = HAIRY

12. AWN (First floret):

[1] OCCURENCE: 1 = ABSENT (Walken) 2 = INFREQUENT (Yancey) 3 = COMMON (Chilocco) 4 = FREQUENT (Random)

[ ] TYPE: 1 = NON-TWISTED 2 = TWISTED 3 = TWISTED GENICULATE

[ ] MM. AWN LENGTH

13. SEED:

[ ] FLORESCENCE UNDER ULTRAVIOLET LIGHT: 1 = FLORESCENT 2 = NON-FLORESCENT

[2] BASAL HAIR: 1 = ABSENT (Florida 501) 2 = ABSENT TO FEW (Yancey) 3 = FEW TO SEVERAL (Lee) 4 = SEVERAL TO NUMEROUS (Florilee) 5 = NUMEROUS (Red Rustproof)

[ ] MM. BASAL HAIR LENGTH

[ ] GMS. PER 1,000 SEEDS

[ ] MG. GROAT WEIGHT (each)

[1 5 2] % GROAT PROTEIN

[ ] % GROAT OIL

14. INSECTS: (0 = NOT TESTED, 1 = SUSCEPTIBLE, 2 = RESISTANT)

[0] CEREAL LEAF BEETLE [0] BLUEGRASS BILLBUG [0] GRAIN BUG (C. Sayi) [0] NEMATODE (Type) ____

[0] GREEN BUG (Biotype) ____ OTHER *(Specify)* ____

15. DISEASE: (0 = NOT TESTED, 1 = SUSCEPTIBLE, 2 = RESISTANT)

[0] HALO BLIGHT [2] POWDERY MILDEW [0] SEPTORIA LEAF BLOTCH [2] SOIL-BORNE MOSIAC

[0] HELMINTHOSPORIUM LEAF BLOTCH [0] YELLOW DWARF VIRUS [0] VICTORIA BLIGHT [0] OTHER *(Specify)* ____

SPECIFY RACES TESTED:

	RACES SUSCEPTIBLE	RACES RESISTANT
[0] CROWN RUST.....		
[0] STEM RUST.....		
[0] COVERED SMUT.....		
[0] LOOSE SMUT.....		

16. INDICATE VARIETY YOU BELIEVE MOST CLOSELY TO RESEMBLE THAT SUBMITTED:

CHARACTER	VARIETY	CHARACTER	VARIETY
PLANT TILLERING	Salem	LEAF COLOR	Salem
LEAF SIZE	Salem	LEAF CARRIAGE	Salem
SEED COLOR	Salem	SEED SHAPE	Salem

COMMENTS: Salem may be substituted for Yancey if this will provide better continuity.