THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Syngenta Seeds, Inc.

Whereas, there has been presented to the

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPLANTED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HERETO 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 THEREOF IS FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICATION INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT 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 TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLACEMENT 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 CONDITIONING IT FOR PROPAGATION, OR STORING IT FOR ANY OF THE ABOVE PURPOSES OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (4 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'S21-A1'

In Testimony Whereof, I have hereto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fifteenth day of November, in the year two thousand two.

Signature
Commissioner, Plant Variety Protection Office
Agricultural Marketing Service

[Seal]
**APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**

1. **NAME OF APPLICANT** (as it is to appear on the Certificate)
   
   Singenta Seeds, Inc.

2. **TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER**
   
   X9621

3. **VARIETY NAME**
   
   S21-A1

4. **ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)**
   
   P.O. Box 959
   
   Minneapolis, MN 55440

5. **TELEPHONE (Include area code)**
   
   612-593-7333

6. **FAX (Include area code)**
   
   612-593-7801

7. **GENUS AND SPECIES NAME**
   
   Glycine max

8. **FAMILY NAME (Botanicals)**
   
   Leguminosae

9. **CROP KIND NAME (Common name)**
   
   Soybean

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

11. **DATE OF INCORPORATION**
    
    1976

12. **NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS**
    
    C. Thorne
    
    Seeds Inc.
    
    P.O. Box 949
    
    Washington, Iowa 52353

13. **DATE OF FILING AND EXAMINATION FEE**
    
    April 14, 1997

14. **DATE OF CERTIFICATION**
    
    1997

15. **TELEPHONE (Include area code)**
    
    319-653-2181

16. **FAX (Include area code)**
    
    319-653-4609

17. **DOES THE APPLICANT 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)**
    
    No

18. **DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?**
    
    No

19. **IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?**
    
    No

20. **HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?**
    
    No

21. **SIGNATURE OF APPLICANT (Owner(s))**
    
    John C. Thorne

22. **DATE**
    
    April 14, 1997

(See reverse for instructions and information collection burden statement)
EXHIBIT A

Origin and Breeding History of the Variety

The soybean variety 'S21-A1' is derived from a single F6 plant from the cross 'W602548' x 'A2234'. W602548 is an experimental line from the cross 'S 14-60' x 'S 23-12'. The cross was made in the winter of 1989 at the Novartis (formerly Northrup King) Research Center at Waimea, Kauai, Hawaii. The F1 generation was grown at the Novartis Research Center at Washington, Iowa, in the summer of 1989; the F2 and F3 at Waimea, in the winter of 1989-90; and the F4 at Washington the summer of 1990. The F1 was bulk harvested. The F2 and F3 were advanced by harvesting 2-4 seeds per plant and planting 600 seed from the resulting bulk. Individual plants of the F4 population were tested for resistance to Phytophthora megasperma, Race 4, by inoculating detached cotyledons with the fungus. Each resistant plant was harvested and threshed individually. The seed from each of these resistant plants were planted in a plant progeny row at Washington in 1991. One of these, numbered W116264, was selected based on early Group 2 maturity and agronomic characteristics for further testing. This line was subsequently tested under the temporary designation X9621 and named S21-A1. It has been tested at several northern cornbelt locations in the U.S. and in Ontario from 1992 through 1996 and found to yield well compared to other early Group 2 varieties. Descriptive characteristics including purple flowers, gray pubescence, tan pods, and imperfect black hilum (may contain up to 2% other hilum) have been identified and confirmed. S21-A1 has been tested in the field for iron deficiency chlorosis and found to be susceptible. It has been tested for reaction to Races 1, 3, 4, and 7 of Phytophthora sojae using hypocotyl inoculation of greenhouse grown plants and found to carry the Rps1-k gene for resistance.

In the winter of 1993-94, 200 seeds of S21-A1 were planted at Waimea. The increase was rogued for flower and pubescence color and 100 single plants were harvested and threshed individually. The progeny from these plants were planted at Washington in the summer of 1994. This increase was carefully rogued at flowering and maturity. Uniform rows which conformed to the variety description were bulked to produce Pedigree Seed. This seed was planted near Washington, IA in 1995 to produce Breeder Seed. The increase block was rogued carefully during flowering and at maturity and found to be uniform.

Foundation Seed of S21-A1 was produced in 1996 from the 1995 Breeder Seed. The Iowa Crop Improvement Association inspected the fields and found them to meet the standards for Foundation Seed.

S21-A1 is stable and uniform within a purity level of 99% (98% for hilum color) except for seed coat peroxidase reaction. Seed coat peroxidase is 95% low (+ or - 5%) and 5% high (+ or - 5%). Over four years of testing and three cycles of seed increase, we have observed no variants. Any off-type plants removed from increase fields were assumed to have arisen from admixture or outcrossing. Varietal purity will be maintained using progeny rows as described previously as needed for the life of the variety.
EXHIBIT B

Novelty Statement for the Variety

S21-A1 is most similar to A2396. It can be differentiated from A2396 on the basis of pod color and reaction to Race 3 of Phytophthora megasperma. S21-A1 has tan pods and is resistant to Race 3; A2396 has brown pods and is susceptible to Race 3.
OBJECTIVE DESCRIPTION OF VARIETY

SOYBEAN (Glycine max L.)

NAME OF APPLICANT(S)

Syngenta (Brasil/202)

TEMPORARY DESIGNATION

X962

VARIETY NAME

S21-A1

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

P.O. Box 859

Minneapolis, MN 55440

FOR OFFICIAL USE ONLY

PVPO NUMBER

9700266

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g., 09).

1. SEED SHAPE:

   1 = Spherical (L/W, L/T, and T/W ratios < 1.2)
   2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio < 1.2)
   3 = Elongate (L/T ratio > 1.2; T/W < 1.2)
   4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

2. SEED COAT COLOR: (Mature Seed)

   1 = Yellow
   2 = Green
   3 = Brown
   4 = Black
   5 = Other (Specify)

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

   1 = Dull ('Corsoy 79'; 'Braxton')
   2 = Shiny ('Nebsoy'; 'Gasoy 17')

4. SEED SIZE: (Mature Seed)

   1
   6
   Grams per 100 seeds

5. HILUM COLOR: (Mature Seed)

   1 = Buff
   2 = Yellow
   3 = Brown
   4 = Gray
   5 = Imperfect Black
   6 = Black
   7 = Other (Specify)

6. COTYLEDON COLOR: (Mature Seed)

   1 = Yellow
   2 = Green

7. SEED PROTEIN PEROXIDASE ACTIVITY:

   1 = Low
   2 = High

95% low (+ or - 5%)

5% high (+ or - 5%)

8. SEED PROTEIN ELECTROPHORETIC BAND:

   1 = Type A (SP₁)
   2 = Type B (SP₂)

9. HYPOCOTYL COLOR:

   1 = Green only ('Evans'; 'Davis')
   2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')
   3 = Light Purple below cotyledons ('Beeon'; 'Pickett 71')
   4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

10. LEAFLET SHAPE:

   1 = Lanceolate
   2 = Oval
   3 = Ovate
   4 = Other (Specify)
11. LEAFLET SIZE:

- 2 = Medium ('Corsoy 79'; 'Gaso7 17')
- 3 = Large ('Crawford'; 'Tracy')
- 1 = Small ('Amsoy 71'; 'A5312')

12. LEAF COLOR:

- 2 = Medium Green ('Corsoy 79'; 'Braxton')
- 3 = Dark Green ('Gnome'; 'Tracy')
- 1 = Light Green ('Weber'; 'York')

13. FLOWER COLOR:

- 2 = Purple
- 3 = White with purple throat
- 1 = White

14. POD COLOR:

- 2 = Brown
- 3 = Black
- 1 = Tan

15. PLANT PUBESCENCE COLOR:

- 2 = Brown (Tawny)
- 1 = Gray

16. PLANT TYPES:

- 2 = Intermediate ('Amcor'; 'Braxton')
- 3 = Bushy ('Gnome'; 'Govan')
- 1 = Slender ('Essex'; 'Amsoy 71')

17. PLANT HABIT:

- 2 = Semi-Determinate ('Will')
- 3 = Indeterminate ('Nebsoy'; 'Improved Pelican')
- 1 = Determinate ('Gnome'; 'Braxton')

18. MATURITY GROUP:

- 8 = V
- 7 = IV
- 6 = III
- 5 = II
- 4 = I
- 11 = XII
- 10 = XI
- 9 = X
- 3 = 0
- 2 = 00
- 1 = 000

19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

BACTERIAL DISEASES:

- 1 = Bacterial Pustule (Xanthomonas phaseoli var. sojensis)
- 1 = Bacterial Blight (Pseudomonas glycines)
- 1 = Wildfire (Pseudomonas tabaci)

FUNGAL DISEASES:

- 1 = Brown Spot (Septoria glycines)
- 1 = Frogeye Leaf Spot (Cercospora sojina)
- 1 = Target Spot (Corynespora cassicola)
- 1 = Downy Mildew (Peronospora trifoliorum var. manshurica)
- 1 = Powdery Mildew (Microsphaera difusa)
- 1 = Brown Stem Rot (Cephalosporium graminum)
- 1 = Stem Canker (Diaporthe phaseolorum var. ceuliwora)

Other (Specify)
19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

FUNGAL DISEASES: (Continued)
- Pod and Stem Blight (Diaporthe phaseolorum var. sojae)
- Purple Seed Stain (Cercospora kikuchii)
- Rhizoctonia Root Rot (Rhizoctonia solani)
- Phytophthora Rot ( Phytophthora megasperma var. sojae)
- Race 1
- Race 2
- Race 3
- Race 4
- Race 5
- Race 6
- Race 7
- Race 8
- Race 9
- Other (Specify)

VIRAL DISEASES:
- Bud Blight (Tobacco Ringspot Virus)
- Yellow Mosaic (Bean Yellow Mosaic Virus)
- Cowpea Mosaic (Cowpea Chlorotic Virus)
- Pod Mottle (Bean Pod Mottle Virus)
- Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:
- Soybean Cyst Nematode (Heterodera glycines)
- Race 1
- Race 2
- Race 3
- Race 4
- Other (Specify)
- Lance Nematode (Hoplolaimus Columbus)
- Southern Root Knot Nematode (Meloidogyne incognita)
- Northern Root Knot Nematode (Meloidogyne hapla)
- Peanut Root Knot Nematode (Meloidogyne arenare)
- Reniform Nematode (Rotylenchulus reniformis)
- OTHER DISEASE NOT ON FORM (Specify):

10. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)
- Iron Chlorosis on Calcareous Soil
- Other (Specify)

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)
- Mexican Bean Beetle (Epilachna varivestis)
- Potato Leaf Hopper (Empoasca fabae)
- Other (Specify)

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

<table>
<thead>
<tr>
<th>CHARACTER</th>
<th>NAME OF VARIETY</th>
<th>CHARACTER</th>
<th>NAME OF VARIETY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Shape</td>
<td>A2242</td>
<td>Seed Coat Luster</td>
<td>S14-60</td>
</tr>
<tr>
<td>Leaf Shape</td>
<td>A2396</td>
<td>Seed Size</td>
<td>S24-92</td>
</tr>
<tr>
<td>Leaf Color</td>
<td>S23-12</td>
<td>Seed Shape</td>
<td>A2234</td>
</tr>
<tr>
<td>Leaf Size</td>
<td>A2242</td>
<td>Seedling Pigmentation</td>
<td>S20-91</td>
</tr>
</tbody>
</table>
23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

<table>
<thead>
<tr>
<th>VARIETY</th>
<th>NO. OF DAYS MATURETY</th>
<th>PLANT LODGING SCORE</th>
<th>CM PLANT HEIGHT</th>
<th>LEAFLET SIZE</th>
<th>SEED CONTENT</th>
<th>SEED SIZE G/100 SEEDS</th>
<th>NO. SEEDS/POD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submitted</td>
<td>126</td>
<td>3.3</td>
<td>75</td>
<td>6</td>
<td>10</td>
<td>39.7</td>
<td>22.3</td>
</tr>
<tr>
<td>A2242</td>
<td>130</td>
<td>3.1</td>
<td>77</td>
<td>6</td>
<td>10</td>
<td>38.6</td>
<td>21.7</td>
</tr>
<tr>
<td>Note: Similar Variety</td>
<td></td>
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</tr>
</tbody>
</table>

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

**STATEMENT OF THE BASIS OF OWNERSHIP**

1. **NAME OF APPLICANT(S):**
   - [Signature: Syngenta Seeds, Inc.]

2. **TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER:**
   - KG621

3. **VARIETY NAME:**
   - S21-A1

4. **ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country):**
   - P.O. Box 959
   - Minneapolis, MN 55440

5. **TELEPHONE (include area code):**
   - 612-593-7333

6. **FAX (include area code):**
   - 612-593-7801

7. **PVPO NUMBER:**
   - 9700266

8. **Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain.**
   - [ ] YES  [ ] NO

9. **Is the applicant (individual or company) a U.S. national or U.S. based company?**
   - [ ] YES  [ ] NO

10. **Is the applicant the original breeder? If no, please answer the following:**
   - [ ] YES  [ ] NO
     - a. If original rights to variety were owned by individual(s):
        - Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country
     - b. If original rights to variety were owned by a company:
        - Is the original breeder(s) U.S. based company? If no, give name of country

11. **Additional explanation on ownership (If needed, use reverse for extra space):**

**PLEASE NOTE:**

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original breeder, both the original breeder and the applicant must meet one of the above criteria.

The original breeder may be the individual or company who directed final breeding. See Section 41a(12) of the Plant Variety Protection Act for definition.