

US EPA ARCHIVE DOCUMENT

EEE BRANCH REVIEW

DATE: IN 4/11/79 OUT 4/19/79 IN _____ OUT _____ IN _____ OUT _____
 FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. Section 18

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCTS(S): I, D, H, F, N, R, S _____

DATA ACCESSION NO(S) _____

PRODUCT MGR. NO. Hoyt Jamerson, Emergency Response Section

PRODUCT NAME(S) Goal

COMPANY NAME Manufactured by Rohm and Haas; Section 18 requested by USDA

SUBMISSION PURPOSE Emergency exemption request to use Goal

Corn - North + South Carolina

CHEMICAL & FORMULATION 2-chloro-(3-ethoxy-4-nitrophenoxy)-4
(trifluoromethyl) benzene

100.0 Pesticidal Use

Control of witchweed in corn in North and South Carolina

100.1 Application Methods/Directions

100.2 Application Rates

Approximately 3,000 pounds of "Goal" will be applied on 2,000 acres of corn. This will be applied in a contiguous 30-county area in North Carolina and South Carolina. Treatment will be a directed spray to the soil surface (pressure not to exceed 25 pounds per square inch) and target weed by ground equipment during May, June, July, and August. A maximum of two applications will be made where necessary. The need for the second application will be based upon survey. The rates for the first application will be three-fourths to 1 pound per acre and one-half to 1 pound per acre for the second application. The higher rates for both the first and second applications will be used where there is a heavy grass cover. The total amount used will not exceed 2 pounds maximum per acre in 1 year. Treatments will be applied by Plant Protection and Quarantine Programs (PPQ) personnel or certified commercial applicators under the supervision of qualified PPQ officers.

Note: A similar program was conducted last year. A description of the program is attached. R. Hitch's 3/6/78 review granted the exemption allowing this program (copy in Oxyflourfen file).

102.0 Behavior in the Environment

(From R. Hitch's 2/7/79 review and last years section 18 for witchweed data. A copy of last year's Section 18 data has been placed in the oxyfluorfen file).

1. Personal communication with C. Collier and S. Toward has revealed that Goal can be expected to:

(1) persist in fields with a half life of approximately 60 days (note that the USDA found no soil residues of Goal immediately after treatment during the Section 18 program last year.

2. Bioaccumulate in fish over 300 x.

103.1 Acute Toxicity (Important data which was not considered in R. Hitch's 3/6/78 review).

Oyster, Crassostrea virginica. 48 hr. larval LC50 32 ppb. Observed no effect level 3.2 ppb. (Called supplemental in R. Hitch's 2/7/79 review because no definite LC50 is determined. The no effect level is, however, valid.

Bluegill, Lepomis macrochirus. 96 hr. LC50. 0.20 ppm. Called core in R. Hitch's 2/7/79 review.

104.0 Hazard Assessment

Note: The following information influenced the text of the conclusions, but was too technical to be entered in that section:

The distance that applicators should lay off of certain habitats was calculated with R. Holst's "SPRAY DRIFT" program.

The following must be assumed when using this program:

- 1. No evaporation of droplets.
- 2. No air turbulence (the droplet is falling due to gravity only).

Quantitative values* used in the program were as follows:

- 1. The application height = 12 feet.
- 2. The critical concentration** in fish habitat = 0.02 ppm. (1/10 the bluegill LC50).
- 3. The critical concentration in oyster habitat = 0.0032 ppm.
- 4. Application rate in pounds/acre = 2.
- 5. Maximum allowable windspeed = 5 MPH.

* Computer printout attached

** No endangered species occur in the proposed treatment area

107.0 Conclusions

Section 18 of The Federal Insecticide, Fungicide, and Rodenticide Act allows exemption of any Federal or State agency from any provision of the act if emergency conditions exist which require such exemption. Witchweed was according to the USDA found in the United States in 1956. The USDA estimates that if the weed spreads it will cost farmers \$675 million in annual control cost plus an estimated 10 percent loss in yield. The Section 18 program presented by the Dept. of Agriculture for control of witchweed in cultivated fields can not be considered to be a proper response to an emergency which poses such financial hardship unless this Section 18 has been preceded by attempts to actually eradicate every source of witchweed infestation on crop and noncrop land.

Three other data elements have been confirmed concerning Goal environmental effects since the program was reviewed by the Ecological Effects Branch last year.

These are:

1. Goal can be expected to accumulate in fish 300 fold above aquatic background levels.
2. The 96 hr. LC50 of Goal on bluegill sunfish is approximately 0.2 ppm.
3. The 48 hr. observed no effect level on oyster, Crassostrea virginica larvae is 3.2 ppb.

In view of the above information, the Ecological Effects Branch can concur with the proposed Section 18 program only under the following conditions:

1. That the Department of Agriculture submit a listing of the steps it has taken to eliminate witchweed from the United States.
2. That applications be made no closer than 60 feet to fish habitat.
3. That applications be made no closer than 120 feet to oyster habitat.

- 4. That 15 young-of-year fish are analyzed for Goal residues two weeks before and two weeks after the application in North and South Carolina. The fish should be from a limnetic or estuarine habitat adjacent to a treated field. They should be of the same species and approximately of the same size. Goal should also be measured in the water and hydrosol of the fish habitat. A suggested fish collection protocol is attached. (Butler & Schutzmann, 1978).
- 5. That the methodology for treatment with Goal, collection of soil samples, and analysis of soil samples which was used for the previously-submitted residue monitoring program should be presented to the EPA Emergency Response Section.
- 6. That application not be made when the windspeed exceeds from five miles per hour.
- 7. That cleaning of spray equipment or disposal of waste pesticide not contaminate aquatic habitat.
- 8. That application not occur where runoff is likely to occur.

~~4/24/79~~ Robert Hitch
 Robert Hitch
 Fish and Wildlife Biologist, EEB, HED

4/24/79

Norman Cook
 Registration Coordinator, EEB

Norman Cook 4-25-79

Clayton Bushong
 Chief, EEB

Clayton Bushong 4/25/79

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Htd

DATE: APR 02 1979

SUBJECT: Section 18 Requests

FROM: Emergency Response Section (TS-767)

TO: Clayton Bushong
Branch Chief
EEB, HED (TS-769)

The Emergency Response Section has recently received a Section 18 request from the ~~state of~~ USDA, APHIS for use of Grain on Corn. The Emergency Response Section requests that an evaluation of the proposed use be conducted. If an evaluation can not be completed by May 1, 1979, please advise us by telephone. The completed review and any questions or comments concerning this request should be directed to the undersigned.

COMMENTS:

A Section 18 request for this use was previously reviewed by your Branch (copy or copies of reviews attached). An evaluation of this request should be conducted if additional information is available that would warrant an up-dated review. Otherwise, we will make our recommendation based on the information provided by the previous evaluation of the proposed use. Please advise us on this subject.

Hoy T. Jamerson
Emergency Response Section
Room 315E - Phone # 54851

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Attachment

Witchweed-Striga asiatica (L.) O. Kuntze

The Federal Insecticide, Fungicide, and Rodenticide Act,
as amended, Section 18

Section 18, Part 166.3—Specific Exemption Request

1. Witchweed presents a serious threat to the production of corn, sorghum, and sugarcane in the United States. These crops have an annual value in the United States of more than \$16 billion. Witchweed is an annual semiparasitic plant that was first identified as occurring in the United States in North Carolina and South Carolina in 1956. The infestation had been confined to parts of 37 contiguous counties in the United States. A program to control and suppress witchweed has reduced losses from total crop failures in some cases to occasional minor damage. An eradication trial program has indicated that witchweed can be eradicated. A plan to complete the eradication of this pest from the United States was started in fiscal year 1977.

2. Witchweed is an annual chlorophyll-producing, seed-bearing, semi-parasitic plant that may attack corn, sorghum, sugarcane, and more than 60 other species of the grass family that occur in this country. Witchweed plants are bright green and relatively small usually from 8 to 12 inches tall and are seldom over 18 inches. The species is characterized by bright red flowers, but some may be yellowish-red, yellow, or almost white. A single witchweed plant may produce as many as 500,000 microscopic seed.

Treatment of witchweed with "Goal" in corn will begin in May and continue until August. One or two applications of "Goal" will be made during this time. "Goal" gives effective residual preemergence control of witchweed in emerged corn. It gives as effective postemergence control of witchweed as the presently used herbicides. It provides excellent preemergence control of crabgrass and postemergence control of crabgrass that is less than 6 inches tall. This grassy weed acts as a host to witchweed late in the season after corn has matured.

3. Paraquat and 2,4-D are registered for witchweed control in corn. These two herbicides are effective when applied postemergency to witchweed but provide no residual control of the pest. 2,4-D treatments start about mid-June and continue at 2- to 3-week intervals until a killing frost which normally occurs part of the season after one or two applications of 2,4-D.

Because "Goal" has residual preemergence control of witchweed, the first application can be made in May or June, postemergence to the corn, before witchweed emerges. The second application, if necessary, would be put on in July or August. Two applications will control witchweed throughout

the season. This continuous seasonal control is essential to eradication. During August, September, and October, corn lodges due to wind, insects, and maturity; also heavy rains prevent entry by the ground machines used for all witchweed control. With 2,4-D or paraquat, spraying must stop if fields are lodged or too wet. The eradication efforts of that and previous years are then lost as viable seed are produced to reinfest the area requiring the eradication cycle to be started again. An effective preemergence herbicide with residual control is imperative to eradication of witchweed in order to eliminate the presently necessary repeated applications and their inherent pitfalls previously mentioned. There is no herbicide available to substitute for the "Goal" use pattern. Herbicides are the only known means of controlling this parasitic weed.

4. Treatment of 2,4-D and paraquat are presently used to control this pest in corn. "Goal" will be used instead of 2,4-D in corn on the acres treated.

5. Approximately 3,000 pounds of "Goal" will be applied on 2,000 acres of corn. This will be applied in a contiguous 30-county area in North Carolina and South Carolina. Treatment will be a directed spray to the soil surface (pressure not to exceed 25 pounds per square inch) and target weed by ground equipment during May, June, July, and August. A maximum of two applications will be made where necessary. The need for the second application will be based upon survey. The rates for the first application will be three-fourths to 1 pound per acre and one-half to 1 pound per acre for the second application. The higher rates for both the first and second applications will be used where there is a heavy grass cover. The total amount used will not exceed 2 pounds maximum per acre in 1 year. Treatments will be applied by Plant Protection and Quarantine Programs (PPQ) personnel or certified commercial applicators under the supervision of qualified PPQ officers.

6. Economic losses and benefits based on past observations indicate that where heavy infestations of witchweed have been allowed to go uncontrolled, damage to corn has resulted in complete crop failure. Based upon previous research work, estimates of annual production loss of corn in the United States if witchweed were allowed to spread and not controlled would approach 50 percent of the production. Therefore, corn could not continue to be produced on land infested with witchweed unless control measures were taken. Losses of corn in South Africa where witchweed is common is reported to be greater than that caused by all other diseases and insects combined. If allowed to spread throughout the United States, it is estimated that it would cost the farmers \$675 million in annual control cost plus an estimated 10 percent loss in yield.

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7. It is expected that no adverse effect will occur to man or the environment. Treatments will be made where, in the opinion of knowledgeable experts, treatments are required to attain PPQ objectives. Appropriate safety precautions will be followed. All pesticidal applications will be under the supervision of personnel who meet or exceed the requirements of "knowledgeable experts" as outlined in the Pesticide Enforcement Policy Statement. Monitoring will be conducted under the direction of PPQ personnel in accordance with plans outlined by the Environmental Evaluation Staff to determine the impact of the program on the environment, as well as to obtain residue data in food crops. Any food crop which is found to contain residues that are unacceptable to Environmental Protection Agency (EPA) standards shall not be marketed. Results of the monitoring program will be submitted to EPA.

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UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WASHINGTON, D.C. 20250

March 27, 1979

Mrs. Patricia Critchlow
Pesticide Registration Division
Environmental Protection Agency
401 M Street, SW.
Washington, DC 20460

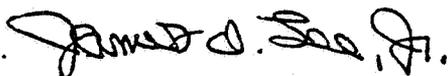
Dear Mrs. Critchlow:

This is in further response to our specific exemption issued March 29, 1978, for the use of RH 2915 (Goal) in the witchweed eradication program in North Carolina and South Carolina.

Enclosed is a copy of the "Summary Report - Residue Monitoring of Directed Spray Applications of Goal in Corn in North Carolina and South Carolina." Attached to the report are the data generated by the analysis at our National Monitoring and Residue Analysis Laboratory in Gulfport, Mississippi. The number of soil samples collected with residues was insufficient to conduct statistical analysis and develop regression lines. All samples of corn grain, cob, husk, and stalk were negative indicating that there were no residues of the compound "Goal" in the plant resulting from program treatments.

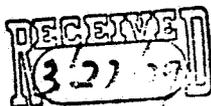
This completes the monitoring for the 1978 specific exemption. If you have any questions, please contact me at Area Code (202) 447-5601.

Sincerely,



James O. Lee, Jr.
Deputy Administrator
Plant Protection and Quarantine Programs

Enclosure



Hand carried

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Summary Report
Residue Monitoring of Directed Spray Applications
of "Goal" in Corn in North Carolina and South Carolina

The Plant Protection and Quarantine Programs (PPQ) exemption for the use of "Goal" in cornfields of North Carolina and South Carolina for the control of witchweed Striga asiatica (L.) required, as a precondition, that residue monitoring be conducted.

During June, July, and August, directed spray applications of the Rohm and Haas herbicide "Goal" were applied in cornfields infested with witchweed.

Applications were made by directing the spray at the base of the corn plant before emergence of the witchweed. The rate of application for initial treatments was 0.75 pounds active ingredient per acre. Fields receiving a second treatment were treated at the rate of 0.5 to 0.75 pounds active ingredient per acre.

The residue monitoring plan required samples of soil, plant, and grain to be collected at pretreatment and approximately day 1, day 20, day 40, and day 80 or at harvest. A sample consisted of a minimum of 1 pound of each environmental component. Samples were to be collected from fields prior to a second treatment and again at the normal interval (80 days). Only one field (site #2) was identified as receiving a second treatment.

Samples collected were packed in dry ice and shipped to the National Monitoring and Residue Analysis Laboratory in Gulfport, Mississippi, for analysis.

Samples were analyzed in accordance with the procedure described by Rohm and Haas in their confidential report "Technical Report 3923-75-22; Terminal Residue Method for RH 2915 and Reduced Metabolites" by L. D. Haines, February 1975.

Only soil samples contained residues. However, the number of samples containing residues was insufficient for statistical analysis. In addition, time degradation over time could not be determined. A listing of the residues are attached.

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<u>SITE NUMBER</u>	<u>ENVIRONMENTAL COMPONENT</u>	<u>TIME FROM APPLICATION</u>	<u>GOAL PPM</u>
1	SOIL	PRETREATMENT	0.0
2	SOIL	PRETREATMENT	0.0
3	SOIL	PRETREATMENT	0.0
6	SOIL	PRETREATMENT	0.0
7	SOIL	PRETREATMENT	0.0
8	SOIL	PRETREATMENT	0.0
9	SOIL	PRETREATMENT	0.0
10	SOIL	PRETREATMENT	0.0
1	SOIL	1.0	0.0
2	SOIL	1.0	0.0
3	SOIL	1.0	0.0
4	SOIL	1.0	0.0
5	SOIL	1.0	0.0
6	SOIL	1.0	0.27
7	SOIL	1.0	0.16
8	SOIL	0.0	0.50
9	SOIL	0.0	0.16
10	SOIL	1.0	0.41
1	SOIL	21.0	0.0
2	SOIL	21.0	0.0
3	SOIL	21.0	0.0
4	SOIL	21.0	0.0
5	SOIL	21.0	0.0
6	SOIL	20.0	0.0
7	SOIL	20.0	0.0
8	SOIL	20.0	0.09
9	SOIL	20.0	0.10
10	SOIL	21.0	0.02
1	SOIL	42.0	0.0
2	SOIL	39.0	0.0
3	SOIL	39.0	0.0
4	SOIL	41.0	0.0
5	SOIL	41.0	0.0
6	SOIL	40.0	0.0
7	SOIL	40.0	0.0
8	SOIL	42.0	0.0
9	SOIL	42.0	0.0
10	SOIL	43.0	0.0
2	SOIL	80.0	0.0
3	SOIL	80.0	0.0
4	SOIL	81.0	0.0
5	SOIL	81.0	0.0
6	SOIL	67.0	0.0
7	SOIL	71.0	0.0
8	SOIL	79.0	0.0
9	SOIL	84.0	0.0
10	SOIL	85.0	0.05

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<u>SITE NUMBER</u>	<u>ENVIRONMENTAL COMPONENT</u>	<u>TIME FROM APPLICATION</u>	<u>GOAL PPM</u>
2	STALK	1.0	0.0
3	STALK	1.0	0.0
4	STALK	1.0	0.0
5	STALK	1.0	0.0
6	STALK	1.0	0.0
7	STALK	1.0	0.0
8	STALK	0.0	0.0
9	STALK	0.0	0.0
10	STALK	1.0	0.0
1	STALK	21.0	0.0
2	STALK	21.0	0.0
3	STALK	21.0	0.0
4	STALK	21.0	0.0
5	STALK	21.0	0.0
6	STALK	20.0	0.0
7	STALK	20.0	0.0
8	STALK	20.0	0.0
9	STALK	20.0	0.0
10	STALK	21.0	0.0
1	STALK	42.0	0.0
2	STALK	39.0	0.0
3	STALK	39.0	0.0
4	STALK	41.0	0.0
5	STALK	41.0	0.0
6	STALK	40.0	0.0
7	STALK	40.0	0.0
8	STALK	42.0	0.0
9	STALK	42.0	0.0
10	STALK	43.0	0.0
2	STALK	80.0	0.0
3	STALK	80.0	0.0
4	STALK	81.0	0.0
5	STALK	81.0	0.0
7	STALK	71.0	0.0
8	STALK	79.0	0.0
9	STALK	84.0	0.0
10	STALK	85.0	0.0

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<u>SITE NUMBER</u>	<u>ENVIRONMENTAL COMPONENT</u>	<u>TIME FROM APPLICATION</u>	<u>GOAL PPM</u>
1	GRAIN	42.0	0.0
1	GRAIN	21.0	0.0
2	GRAIN	80.0	0.0
3	GRAIN	80.0	0.0
4	GRAIN	81.0	0.0
5	GRAIN	81.0	0.0
6	GRAIN	67.0	0.0
7	GRAIN	71.0	0.0
8	GRAIN	79.0	0.0
9	GRAIN	84.0	0.0
10	GRAIN	85.0	0.0

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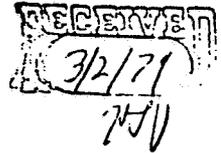
<u>SITE NUMBER</u>	<u>ENVIRONMENTAL COMPONENT</u>	<u>TIME FROM APPLICATION</u>	<u>GOAL PPM</u>
1	HUSK OF CORN	2.0	0.0
1	HUSK OF CORN	21.0	0.0
4	HUSK OF CORN	81.0	0.0
5	HUSK OF CORN	81.0	0.0
6	HUSK OF CORN	67.0	0.0
7	HUSK OF CORN	71.0	0.0
8	HUSK OF CORN	79.0	0.0
9	HUSK OF CORN	84.0	0.0
10	HUSK OF CORN	85.0	0.0

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<u>SITE NUMBER</u>	<u>ENVIRONMENTAL COMPONENT</u>	<u>TIME FROM APPLICATION</u>	<u>GOAL PPM</u>
1	CORN COB	21.0	0.0
1	CORN COB	42.0	0.0
4	CORN COB	81.0	0.0
5	CORN COB	81.0	0.0
6	CORN COB	67.0	0.0
7	CORN COB	71.0	0.0
8	CORN COB	79.0	0.0
9	CORN COB	84.0	0.0
10	CORN COB	85.0	0.0

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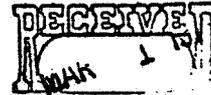
UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WASHINGTON, D.C. 20250



February 28, 1979

Mrs. Pat Critchlow
Pesticides Registration Division
Environmental Protection Agency
401 M Street, SW.
Washington, DC 20460

Hand Delivered



Dear Mrs. Critchlow:

In accordance with Section 18, Part 166.5 (d), enclosed is a Summary Report of the specific exemption for the use of "Goal" in the witchweed program issued April 4, 1978. As stated in our letter of December 22, 1978, to Mr. Doug Campt, the chemical analysis of samples collected for residue study have not been completed. You will be provided a report of the monitoring results as soon as possible.

Also, enclosed is a request for specific exemption, in accordance with Section 18, Part 166.3 of the Federal Insecticide, Fungicide and Rodenticide Act, in the witchweed eradication program in North Carolina and South Carolina during the 1979 growing season.

The inclusion of "Goal" in this program will permit treatment of corn acreage where, in the opinion of the Plant Protection and Quarantine personnel, the use of existing registered compounds will provide inadequate or incomplete control or where wet fields or crop lodging prevent necessary 2,4-D and paraquat treatments.

Because "Goal" has residual preemergence control of witchweed, previous eradication efforts will not be lost due to wet fields or lodging. 2,4-D and paraquat treatments must be terminated when lodged or wet fields are encountered. Consequently viable witchweed seed are produced and previous eradication efforts are lost. There is no herbicide registered and available to substitute for the "Goal" use pattern.

Your early consideration of this request would be appreciated. If you have any questions, please contact me at Area Code (202) 447-5601.

Sincerely,

J. F. Spears
Acting Deputy Administrator
Plant Protection and Quarantine Programs

2 Enclosures

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Summary Report
Control of Witchweed with "Goal"

Witchweed, Striga asiatica (L.) O. Kuntze, is an annual Chlorophyll-producing, seed-bearing, semiparasitic plant that attacks corn, sorghum, and sugarcane, and presents a serious threat to the production of these crops. It was first found in the United States in North Carolina and South Carolina in 1956. The infestation has been confined to parts of 38 contiguous counties in these 2 States. A program to control and suppress witchweed has reduced losses from total crop failures in some cases to occasional minor damage. An eradication trial program has indicated that witchweed can be eradicated. A plan to complete the eradication of this pest from the United States was started in FY 1977.

The Methods Center at Whiteville, North Carolina, is working on more effective methods of controlling this pest to aid in the eradication program and has developed the use of "Goal" for control of witchweed in corn. The Environmental Protection Agency (EPA) granted a specific exemption to the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, as provided under Section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to apply "Goal" in cornfields in the witchweed eradication program in the States of North Carolina and South Carolina.

"Goal" was applied from June 16, 1978, until August 29, 1978. In North Carolina, it was used in the following counties: Brunswick, Columbus, Cumberland, Duplin, Green, Harnett, Pender, Richmond, Robeson, Sampson, Scotland, and Wayne, on a total of 690 aggregate acres. Initial treatments of "Goal" were applied at three-quarters pound per acre on 556 acres, and 1 pound per acre on 94 acres. Retreatments were applied at one-half pound per acre of 16 acres, and three-fourths pound per acre on 24 acres. A total of 537 pounds of "Goal" was used in North Carolina.

In South Carolina, "Goal" was applied to corn for witchweed control in the following counties: Dillon, Florence, Horry, Marion, and Marlboro Counties. A total of 348.3 aggregate acres was treated in South Carolina. All initial treatments were three-fourths pound per acre, and 42.3 acres were retreated with "Goal" at one-half pound per acre. A total of 250.65 pounds of "Goal" was used in South Carolina.

Results of treatment with "Goal" were excellent. Control lasted from 6 weeks to full season. There were no adverse effects observed on corn or other aspects of the environment.

Samples of soil, corn plants, and mature grain were taken from six fields in North Carolina and three fields in South Carolina. Results of analyses of these samples have not been received from the laboratory. As indicated in our letter of December 22, 1978, a report on residues will be submitted by mid-March.

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