

NATURAL PRODUCTS FOR WEED CONTROL IN TURF

**NICK CHRISTIANS
IOWA STATE UNIVERSITY**



FUNDAMENTALS OF
TURFGRASS MANAGEMENT

FIFTH EDITION

NICK E. CHRISTIANS · AARON J. PATTON · QUINCY D. LAW

WILEY

2018 EDITION

Turfgrass Weed Control

for Professionals

EXPERT
REVIEWED



Illinois
University of Illinois Extension EC007-18

Indiana
Purdue Extension EW-18

Iowa
Iowa State University Extension
and Outreach EW007-18A

Kansas
Kansas State University Extension
and Outreach EW-18A

Kentucky
University of Kentucky Cooperative
Extension Service EW-18

Michigan
Michigan State University Extension EW-18

Minnesota
University of Minnesota Extension

Missouri
University of Missouri EW-18

Nebraska
University of Nebraska-Lincoln
Extension EW-18

New Jersey
 Rutgers, The State University of New Jersey

New York
Cornell University

Ohio
The Ohio State University Extension EW006-18

Pennsylvania
Penn State University

Wisconsin
University of Wisconsin Extension EW-18

PURDUE
EXTENSION

A. J. TURGEON
L. B. McCARTY
NICK CHRISTIANS



WEED CONTROL
IN TURF AND ORNAMENTALS

NATURAL HERBICIDES

DEFINITION

NON CHEMICAL?

NATURAL ORIGIN?

MAYBE

IRON?

THINGS OTHER THAN TRADITIONAL HERBICIDES

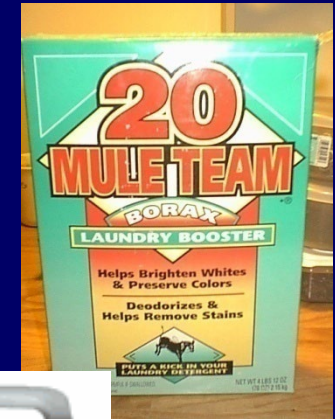
NATURAL PRODUCTS

- Comprised mostly of plant essential oils
- Very little published research on products

Clove oil



Boron



Active Ingredient

Herbicidal action

Essential oils

Desiccant

Soaps

Desiccant

Acids

Desiccant

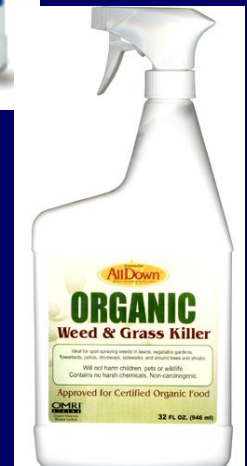
Boron

Nutrient Toxicity

Clove oil



Acetic acid (vinegar)



BORAX FOR GROUND IVY

- **Mix 10 oz of borax in 3 gallons of water.**
- **Stir well to mix and create a solution.**
- **Apply the borax solution over 1000 sq. ft. of turfgrass affected with Ground Ivy.**
- **Wait for a week or two to see signs of dying ground ivy.**
- **Repeat the application after about 2 months if you do not see results.**

SCOTTS BIO-HERBICIDE

- *Phoma macrostoma*
 - Fungi
 - Preemergence and postemergence
 - Causes chlorosis in target plants
- Dandelion and clover
- Repeat application

FIESTA

IRON HEDTA (CHELATE) 26%

12.5 oz product/1000 ft²

**Selectively burns off
weeds without
damaging grass**

**\$120 per gallon—10,000
ft²**

CORN GLUTEN MEAL

- **PREEMERGENCE CONTROL**
- **10% N**
- **DOING WELL**
- **LICENSED HYDRDOLYSATE 2006**
 - **ENVIRONMENTAL FACTOR**
 - **ONTARIO CANADA**

**THE USE OF CORN
GLUTEN MEAL FOR
WEED CONTROL**

**NICK CHRISTIANS
IOWA STATE UNIVERSITY**

www.gluten.iastate.edu

THE IDEA CAME
FROM AN
UNRELATED
STUDY ON GRASS
DISEASES







FIVE CORN COMPONENTS TESTED

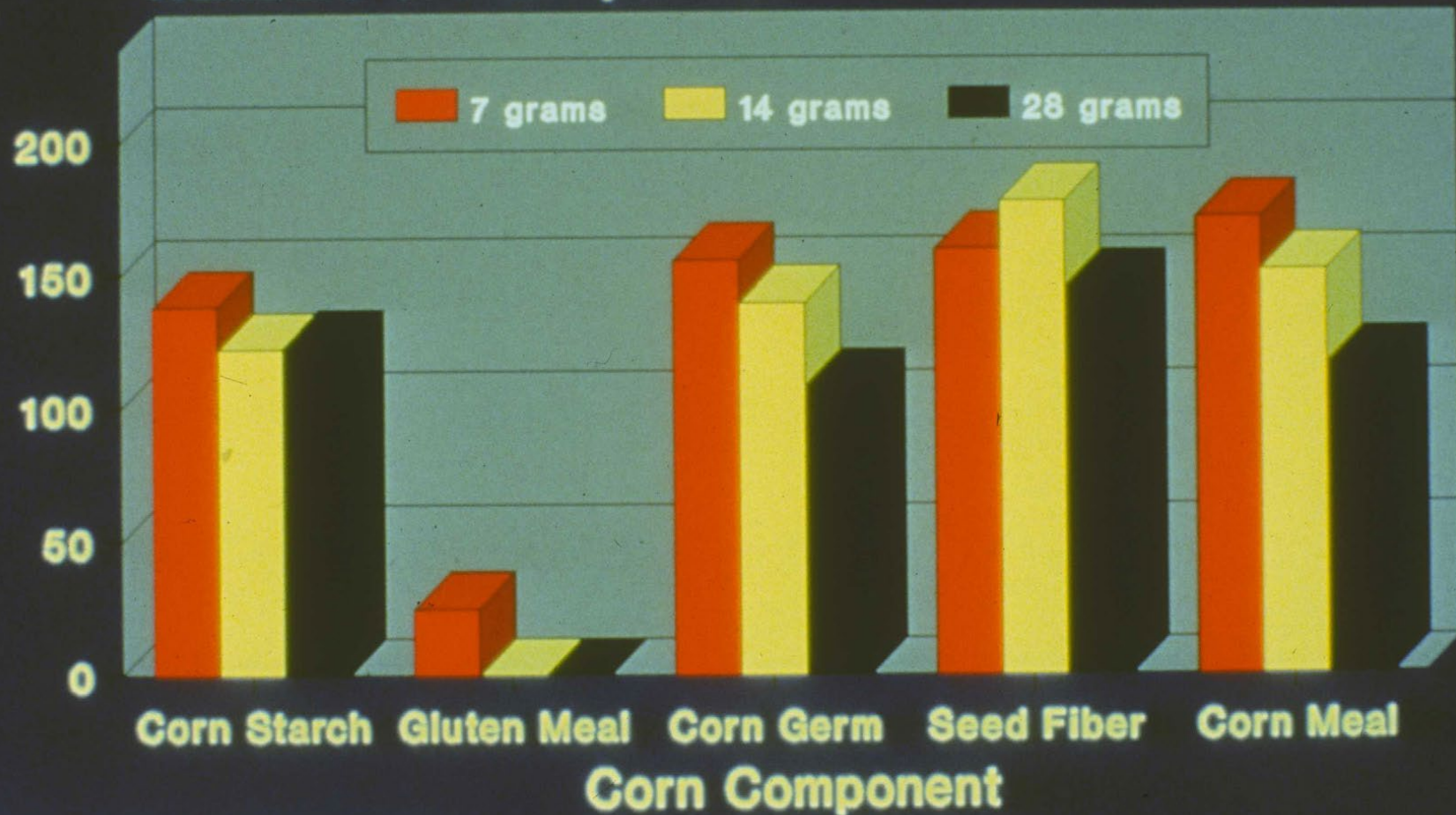
- **CORN MEAL**
- **INDUSTRIAL CORN STARCH**
- **DRIED CORN GERM**
- **CORN SEED FIBER**
- **CORN GLUTEN MEAL**





Plant Numbers of Five Corn Components on Creeping Bentgrass

Numbers of Plant per Pot



Feb. 1, 1988 to March 3, 1988
Pot= 4"X4", Seed rate= 0.10g
Control= 182, n=4

CORN GLUTEN MEAL

- **BYPRODUCT OF WET MILLING**
- **60% PROTEIN BY WEIGHT**
- **10% NITROGEN BY WEIGHT**
- **SOLD AS A FEED MATERIAL FOR CATTLE, POULTRY, FISH, AND DOGS**

**COULD IT BE USED IN
TURF AS A NATURAL
FERTILIZER AND AS
A WEED CONTROL
FOR ANNUALS, LIKE
CRABGRASS?**

FIELD TESTING BEGAN IN LATE 1980'S

EXCELLENT FERTILIZER

GOOD WEED CONTROL

20 LBS/1000 SQ. FT.

STANDARD PROGRAM: 20 LBS IN
SPRING AND 20 LBS IN LATE
SUMMER TO EARLY FALL

CONTROL OF ANNUALS

- **APPROXIMATELY 60% FIRST YEAR**
- **80% + IN SECOND YEAR**
- **90% + IN THIRD YEAR**

**HOW ABOUT
PERENNIAL
BROADLEAVES?**



5 5 93



US PATENT 5,030,268

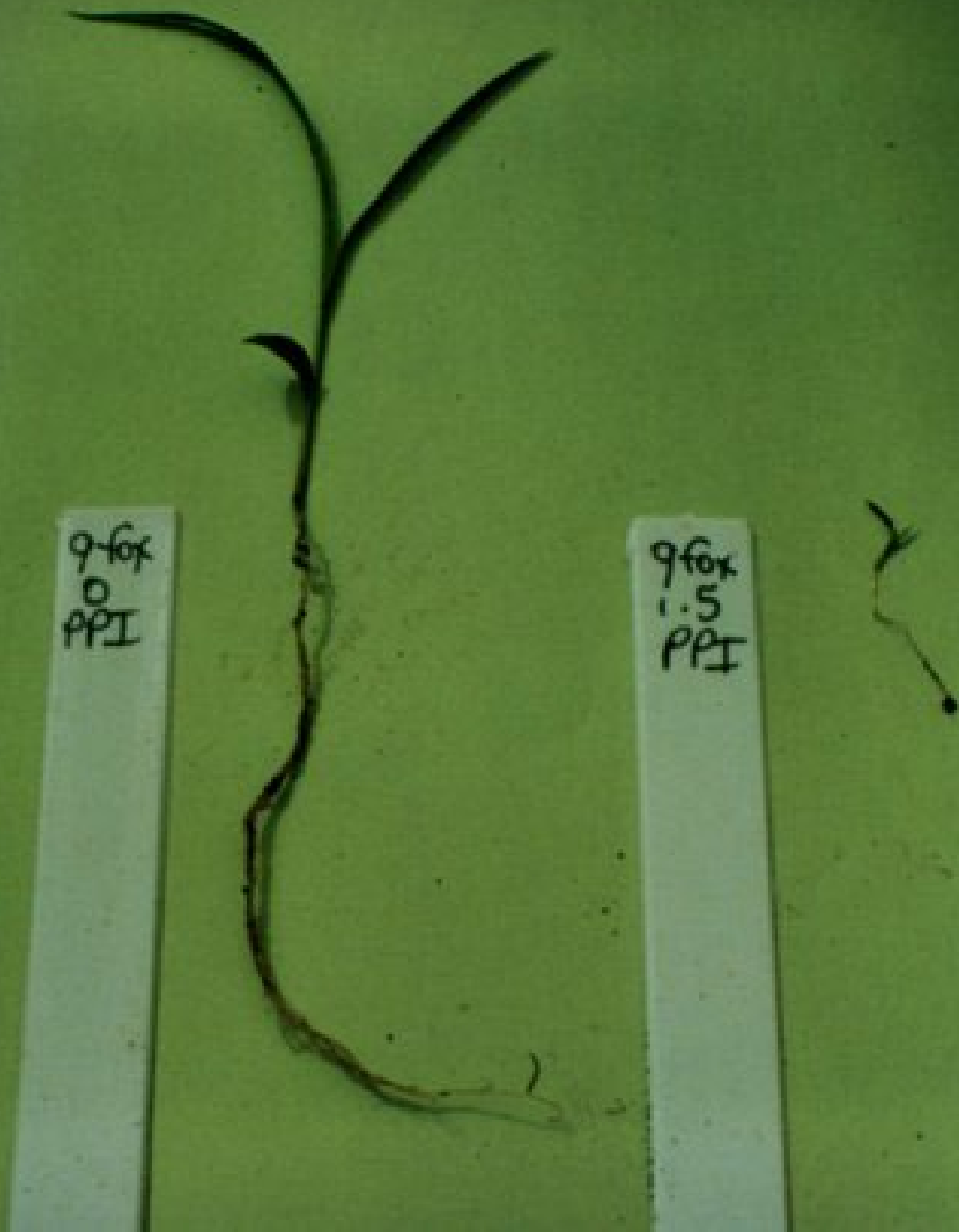
PREEMERGENCE WEED
CONTROL USING CORN
GLUTEN MEAL

WEED SPECTRUM

- **ANNUAL BLUEGRASS**
- **BLACK MEDIC**
- **BUCKHORN PLANTAIN**
- **LAMBSQUARTERS**
- **DANDELION**
- **FOXTAIL**
- **PURSLANE**
- **REDROOT PIGWEED**

9fox
0
PPI

9fox
1.5
PPI



BIM
0
PRE
4



BIM
1.5
PRE
5



**NCERA-192
TURFGRASS REGIONAL
RESEARCH GROUP**



NCERA-192
TURFGRASS REGIONAL
RESEARCH GROUP

SPONSORED BY USDA
AVOID DUPLICATION
PERFORM REGIONAL
PROJECTS

**Efficacy of Corn Gluten Meal
and Fiesta Herbicide
Combinations for Crabgrass
Control
2021-2022**

**OBJECTIVE: TO DETERMINE
HOW EFFECTIVE THESE TWO
NATURAL PRODUCTS ARE AT
CONTROLLING CRABGRASS IN
TURF**

**Efficacy of Corn Gluten Meal
and Fiesta Herbicide
Combinations for Crabgrass
Control
2021-2022**

**KENTUCKY BLUEGRASS
RANDOMIZED COMPLETE
BLOCK
4 REPLICATIONS
MOST NORTH CENTRAL
STATES**

TREATMENTS

- 1. Nontreated**
- 2. Corn gluten meal (CGM) (30 lbs/M) applied approximately 1 week before crabgrass predicted emergence in your location**

TREATMENTS

3. Fiesta (FeHEDTA – 25.2 fl oz/M) alone in spring when crabgrass reaches the 2-leaf stage which will be about 3 weeks after crabgrass germination at many locations. Additionally, apply a sequential Fiesta application 2 weeks after the first application.

TREATMENTS

4. Fiesta (25.2 fl oz/M) alone early summer when crabgrass reaches 1-2 tiller in size. This should occurs about 6 weeks after crabgrass emergence. Additionally, apply a sequential Fiesta application 2 weeks after the first application.

TREATMENTS

5. Corn Gluten Meal PRE + Fiesta spring

**Apply CGM (30 lbs/M) PRE
(same as #2)**

**Apply Fiesta (25.2 fl oz/M) in
late spring (crabgrass 2-leaf
stage – same as above trt #3)**

**Apply Fiesta (25.2 fl oz/M) in
late spring 2 weeks after
initial Fiesta application
(same as above trt #3)**

TREATMENTS

6. Corn Gluten Meal PRE + Fiesta early summer

**Apply CGM (30 lbs/M) PRE (same
as #2)**

**Apply Fiesta (25.2 fl oz/M) in early
summer (crabgrass 1-2 tiller in
size – same as above trt #4)**

**Apply Fiesta (25.2 fl oz/M) in early
summer 2 weeks after initial
Fiesta application (same as above
trt #4)**

TREATMENTS

7. 2.7 lbs N/M from a sustane treatment (to mimic N amount and release from CGM) (same timing as above trt #2)

8. Dimension 2EW at 0.5 lbs ai/A (same timing as above trt #2)

OBSERVATIONS SO FAR

DIMENSION REALLY WORKS

GOOD

OTHER TREATMENTS HIGHLY

VARIABLE

NATURAL APPROACH TAKES

TIME

IT IS EXPENSIVE