

AD-A172 698

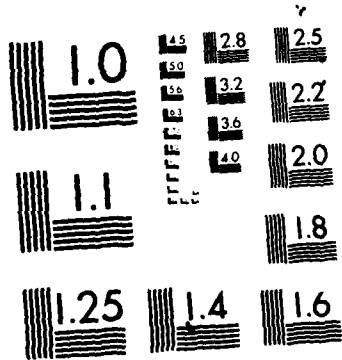
ENVIRONMENTAL IMPACT RESEARCH PROGRAM GRASS SEEDER
SECTION 845 US ARMYCC (U) ARMY ENGINEER WATERWAYS
EXPERIMENT STATION VICKSBURG MS ENVIR T B DOERR
JUL 86 WES/TR/EL-86-32 F/G 13/2

1/1

UNCLASSIFIED

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

12

**ENVIRONMENTAL IMPACT
RESEARCH PROGRAM**

TECHNICAL REPORT EL-86-32

GRASS SEEDER

Section 8.4.5, US ARMY CORPS OF ENGINEERS
WILDLIFE RESOURCES MANAGEMENT MANUAL

by

Ted B. Doerr

Environmental Laboratory

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
PO Box 631, Vicksburg, Mississippi 39180-0631

DTIC
ELECTE
OCT 3 1986

S

B



July 1986

Final Report

Approved For Public Release - Distribution Unlimited

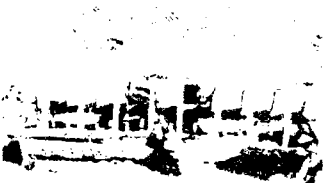
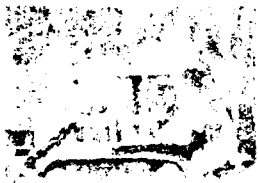
Prepared for: DEPARTMENT OF THE ARMY
US Army Corps of Engineers
Washington, DC 20314-1000
Under EIRP Work Unit 31631

86 10 01 16



**US Army Corps
of Engineers**

AD-A172 698



DTIC FILE COPY

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION Unclassified		1b RESTRICTIVE MARKINGS	
2a SECURITY CLASSIFICATION AUTHORITY		3 DISTRIBUTION AVAILABILITY OF REPORT Approved for public release; distribution unlimited.	
2b DECLASSIFICATION/DOWNGRADING SCHEDULE		5 MONITORING ORGANIZATION REPORT NUMBER(S)	
4 PERFORMING ORGANIZATION REPORT NUMBER(S) Technical Report EL-86-32		7a NAME OF MONITORING ORGANIZATION	
6a NAME OF PERFORMING ORGANIZATION USAEWES Environmental Laboratory	6b OFFICE SYMBOL <i>(if applicable)</i>	7b ADDRESS (City, State, and ZIP Code)	
6c ADDRESS (City, State, and ZIP Code) PO Box 631 Vicksburg MS 39180-0631		9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8a NAME OF FUNDING SPONSORING ORGANIZATION US Army Corps of Engineers	8b OFFICE SYMBOL <i>(if applicable)</i>	10 SOURCE OF FUNDING NUMBERS	
8c ADDRESS (City, State, and ZIP Code) Washington, DC 20314-1000		PROGRAM ELEMENT NO	PROJECT NO
		TASK NO	WORK UNIT ACCESSION NO EIRP 31631
11 TITLE (Include Security Classification) Grass Seeder: Section 8.4.5, US Army Corps of Engineers Wildlife Resources Management Manual			
12 PERSONAL AUTHOR(S) Doerr, Ted B.			
13a TYPE OF REPORT Final report	13b TIME COVERED FROM _____ TO _____	14 DATE OF REPORT (Year, Month, Day) July 1986	15 PAGE COUNT 10
16 SUPPLEMENTARY NOTATION Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.			
17 COSATI CODES		18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	
			Grass seeder Cultipacker seeder Revegetation
			Equipment Pasture improvement
			Planting methods Grass-legume mixture
19 ABSTRACT (Continue on reverse if necessary and identify by block number)			
<p>An equipment report on grass seeders is provided as Section 8.4.5 of the US Army Corps of Engineers Wildlife Resources Management Manual. The report is designed to assist the Corps District or project biologist with the selection and use of types of equipment and materials available for habitat development and manipulation. Topics covered include description, operation and maintenance, limitations, and availability.</p> <p>The grass seeder is used primarily to establish uniform grass and grass-legume stands on well-prepared soil surfaces. Management objectives for using grass seeders are stated, and applications to habitat improvement are discussed. The design and assembly of equipment are described and illustrated, and general specifications are provided. Methods of operation are described, and maintenance and safety requirements are given. Appropriate cautions and limitations are discussed.</p>			
20 DISTRIBUTION AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS		21 ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a NAME OF RESPONSIBLE INDIVIDUAL		22b TELEPHONE (Include Area Code)	22c OFFICE SYMBOL

PREFACE

This work was sponsored by the Office, Chief of Engineers (OCE), US Army, as part of the Environmental Impact Research Program (EIRP), Work Unit 31631, entitled Management of Corps Lands for Wildlife Resource Improvement. The Technical Monitors for the study were Dr. John Bushman and Mr. Earl Eiker, OCE, and Mr. Dave Mathis, Water Resources Support Center.

This report was prepared by Mr. Ted B. Doerr, Range Science Department, Colorado State University, Fort Collins, Colo. Mr. Doerr was employed by the Environmental Laboratory (EL), US Army Engineer Waterways Experiment Station (WES), under an Intergovernmental Personnel Act contract with Colorado State University during the period this report was prepared. Mr. Chester O. Martin, Team Leader, Wildlife Resources Team, Wetlands and Terrestrial Habitat Group (WTHG), EL, was principal investigator for the work unit. Equipment specifications and photographs were provided by personnel from Brillion Iron Works, Brillion, Wisc. Review and comments were provided by Mr. Martin, WES, and Mr. Larry E. Marcy, Texas A&M University.

The report was prepared under the general supervision of Dr. Hanley K. Smith, Chief, WTHG, EL; Dr. Conrad J. Kirby, Chief, Environmental Resources Division, EL; and Dr. John Harrison, Chief, EL. Dr. Roger T. Saucier, WES, was Program Manager, EIRP. The report was edited by Ms. Jessica S. Ruff of the WES Publications and Graphic Arts Division (PGAD). Drawings were prepared by Mr. John R. Harris, Scientific Illustrations Section, PGAD, under the supervision of Mr. Aubrey W. Stephens, Jr.

COL Allen F. Grum, USA, was the previous Director of WES. COL Dwayne G. Lee, CE, is the present Commander and Director. Dr. Robert W. Whalin is Technical Director.

This report should be cited as follows:

Doerr, Ted B. 1986. "Grass Seeder: Section 8.4.5, US Army Corps of Engineers Wildlife Resources Management Manual," Technical Report EL-86-32, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

NOTE TO READER

This report is designated as Section 8.4.5 in Chapter 8 -- EQUIPMENT, Part 8.4 -- DRILL AND BROADCAST SEEDERS, of the US ARMY CORPS OF ENGINEERS WILDLIFE RESOURCES MANAGEMENT MANUAL. Each section of the manual is published as a separate Technical Report but is designed for use as a unit of the manual. For best retrieval, this report should be filed according to section number within Chapter 8.



Account	
DE	
DATE	
BY	
Dist	
A-1	

✓

GRASS SEEDER

Section 8.4.5, US ARMY CORPS OF ENGINEERS
WILDLIFE RESOURCES MANAGEMENT MANUAL

DESCRIPTION	3	AVAILABILITY	6
OPERATION AND MAINTENANCE	5	LITERATURE CITED	7
LIMITATIONS	5		

The grass seeder (also known as a cultipacker seeder) is used primarily to establish uniform grass and grass-legume stands on well-prepared soil surfaces. It firms the seedbed, plants seeds, and covers the seed using a method similar to the Oregon press seeder. The grass seeder has been used throughout the United States for pasture improvement and strip-mine revegetation (Larson 1980), as well as for turf-farming, sod-farming, and landscaping (Brillion Iron Works 1983a, b). It has also been used successfully in the Southwest following pitting (Anderson et al. 1953), contour furrowing, and ripping (Vallentine 1971).

DESCRIPTION

The grass seeder is composed of a double seedbox centered over 2 cultipacker rollers mounted on a wheel-supported frame (Fig. 1). The cultipacker rollers either have a V-shaped ridge or are toothed to pulverize surface soil clods and create furrows for planting. Each cultipacker roller is attached by floating axles that allow the rollers to follow the ground contour. The spreader seedboxes have 2 compartments, 1 each for grass seeds and legume seeds. Seeds flow directly from the seedbox to the soil surface and do not pass through seed tubes. This eliminates clogging problems encountered with drill seeders but reduces accuracy of seed placement. Wide metal deflectors between the rollers prevent winds from blowing the seed away. They guide the seed down between rollers, where the rear section covers the seed with 0.5 in. of soil. Seed metering can be adjusted easily and is powered by a chain-gear

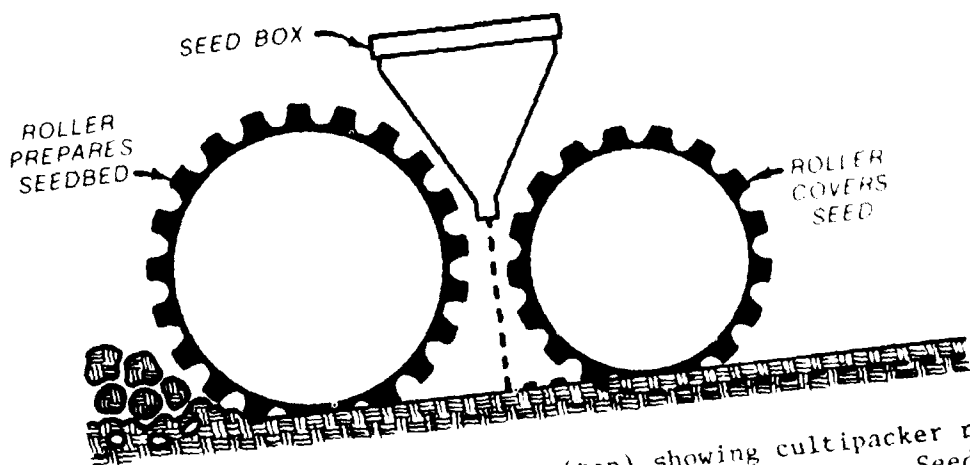
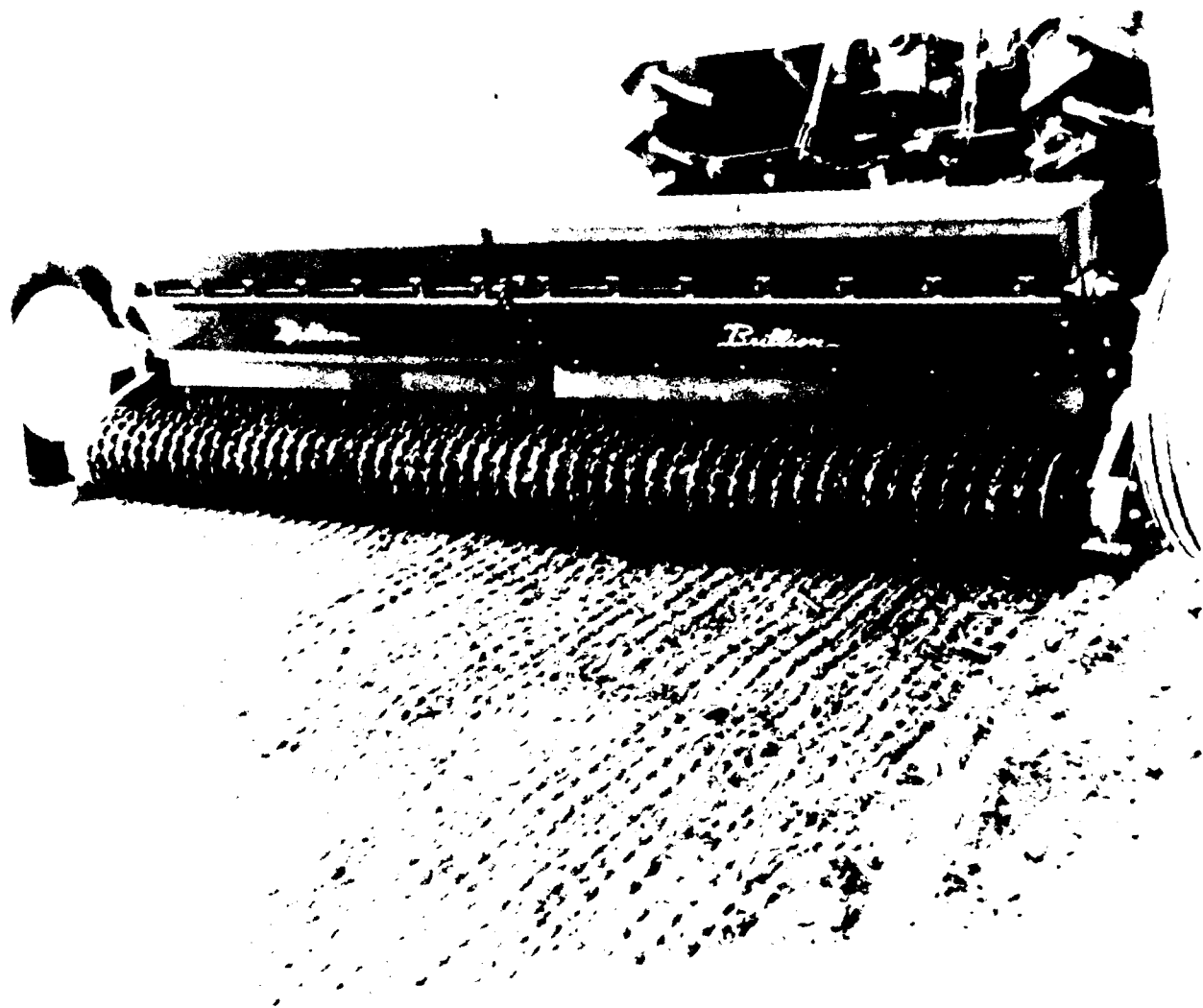


Figure 1. Rear view of the grass seeder (top) showing cultipacker rollers, seedboxes, and shallow furrows left by the rollers. Seeding mechanism of the grass seeder (bottom) showing how the front roller creates the planting furrows and the rear roller covers the seed with soil (photo courtesy of Brillion Iron Works)

mechanism attached to the front cultipacker roller. Further specifications are given in Table 1.

OPERATION AND MAINTENANCE

Sites should be cleared of debris and the soil tilled before planting. The grass seeder can then be safely pulled 2 to 5 mph behind a tractor. The first cultipacker roller firms the seedbed, pulverizes small soil clods, and creates small, shallow furrows in the soil surface (Vallentine 1971). The seeds are planted 0.25 to 0.5 in. deep in the furrows, and the second (back) cultipacker roller covers the seeds and creates new shallow furrows that aid in moisture retention for improved seedling establishment.

All nuts and bolts should be checked prior to operation and tightened when necessary (Brillion Iron Works 1978). Seed metering adjustments and calibration should be accomplished before use. Grease fittings should be lubricated before use, and cultipacker rollers and wheel bearings should be greased annually. Seedboxes should be cleaned periodically and rust removed as necessary. The seeder should be protected from inclement weather for long-term storage.

Table 1. Specifications for grass seeders

<u>Feature</u>	<u>Specification</u>
Width	5, 8, 10, 12 ft
Weight	915-2700 lb
Furrow spacing	2.3 in.
Seedbox capacity	0.75, 1, 1.25, 2, 2.5, 5.25 bu
Roller diameter	
Front	12 in.
Back	9 in.
Power requirements	40 hp

LIMITATIONS

This seeder performs poorly on uneven ground or where brush, rocks, or other debris covers the soil surface. Thorough seedbed preparation (disking or harrowing) is required prior to seeding for best results. Intense rains

rapidly deteriorate the small furrows created by the second cultipacker (Larson 1980).

AVAILABILITY

Grass seeders are available from:

Brillion Iron Works
200 Park Ave.
Brillion, Wisconsin 54110

LITERATURE CITED

- Anderson, D., L. P. Hamilton, H. G. Reynolds, and R. R. Humphrey. 1953. Reseeding desert grassland ranges in southern Arizona. Ariz. Agric. Exp. Sta. Bull. 249.
- Brillion Iron Works. 1978. Operators manual - Sure stand grass seeders. Brillion, Wis. 15 pp.
- _____. 1983a. Turf-maker and landscape seeders. Form No. 55-E. Brillion, Wis. 4 pp.
- _____. 1983b. Ag model sure-stand grass seeder. Form No. 51-L. Brillion, Wis. 4 pp.
- Larson, S. E. 1980. Revegetation equipment catalogue. USDA For. Serv. Equipment Development Center, Catalogue No. 8042 2501. 198 pp.
- Vallentine, J. F. 1971. Range Development and Improvements, Brigham Young Univ. Press, Provo, Utah. 516 pp.

END

11-86

DT/C