

Results of Tests on Vegetated Waterways, and Method of Field Application

By

MAURICE B. COX and VERNON J. PALMER

OKLAHOMA AGRICULTURAL EXPERIMENT STATION

Oklahoma A. and M. College, Stillwater

W. L. Blizzard, Director

Louis E. Hawkins, Vice Director

IN COOPERATION WITH

SOIL CONSERVATION SERVICE

United States Department of Agriculture

CONTENTS

Description of Laboratory	5
Procedure	6
Description of Vegetal Linings	9
Protective Ability of Vegetations Tested	10
Capacity of Vegetal-lined Channels	12
Summary and Conclusions	13
Literature Cited	13
Appendix	27

Illustrations

Figure	Page
1. Arrangement of the experimental area -----	6
2. Completed test channels -----	6
3. Installing channel sidewalls -----	6
4. Channel with extension walls in place in readiness for testing -----	7
5. Rate measuring flume -----	7
6. Equipment and procedure used in making bed and water surface observations -----	8
7. Very dense, uniform cover of short Bermuda grass -----	9
8. Blue grama after testing -----	9
9. Buffalo grass before testing -----	10
10. Weeping lovegrass before testing -----	10
11. Native grass mixture before testing -----	11
12. Relationship of Manning's n to VD for <i>green, uncut alfalfa</i> in good, uniform stands -----	14
13. Relationship of Manning's n to VD for <i>long, green Bermuda grass</i> -----	15
14. Relationship of Manning's n to VD for <i>short, green Bermuda grass</i> -----	16
15. Relationship of Manning's n to VD for good, uniform covers of <i>green blue grama grass</i> -----	17
16. Relationship of Manning's n to VD for <i>unmowed buffalo grass</i> -----	18
17. Relationship of Manning's n to VD for various conditions of green weeping lovegrass -----	19
18. Relationship of Manning's n to VD for second season <i>uncut native grass mixture</i> -----	20
19. Experimental n -VD results as related to the general vegetal retardance curves, A, B, C, and D -----	21
20. Degrees of vegetal retardance for which graphical solutions of the Manning formula have been prepared -----	22
21. Solution of the Manning formula for Retardance A -----	23
22. Solution of the Manning formula for Retardance B -----	24
23. Solution of the Manning formula for Retardance C -----	25
24. Solution of the Manning formula for Retardance D -----	26
25. Dimensions of trapezoidal channels with 4:1 side slopes -----	27

Tables

Table		Page
1.	Experiments conducted, bed slopes of channels, and vegetation measurements -----	28
2.	Results of tests of channels lined with <i>alfalfa</i> -----	29
3.	Results of tests of channels lined with <i>long Bermuda grass</i> -----	29
4.	Results of tests of channels lined with <i>short Bermuda grass</i> -----	32
5.	Results of tests of channels lined with <i>blue grama grass</i> -----	34
6.	Results of tests of channels lined with <i>buffalo grass</i> -----	36
7.	Results of tests of channels lined with <i>weeping lovegrass</i> -----	40
8.	Results of tests of channels lined with a <i>native grass mixture</i> -----	42