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9. ABSTRACT

A volume of abstracts produced by a bibliographic retrieval system, called the Watershed Management Information System (WAMIS), initiated in 1972 by the School of Renewable Natural Resources, University of Arizona. The purpose of WAMIS is to provide bibliographic references on topics of interest in the general area of natural resource management. Users of WAMIS submit a request and receive an individualized computer printout with a citation and abstract for each reference. There are no user restrictions. This bibliography, WAMIS Abstract No. 3, is a sample of the materials retrievable through WAMIS. It deals with three topics relating to soil erosion: forecasting soil erosion; mechanical or conservation practices for erosion control; and vegetal erosion controls. Potential users of WAMIS are invited to write to the School of Renewable Natural Resources for further information, or to submit search requests.

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WAMIS ABSTRACTS

NO. 3

Selected References on Soil Erosion

School of Renewable Natural Resources
University of Arizona
Tucson, Arizona

July 1976

W A M I S A B S T R A C T S

N O . 3

Selected References on Soil Erosion

Compiled by

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PREFACE

In 1972 the School of Renewable Natural Resources began development of a bibliographic retrieval system, called the Watershed Management Information System (WAMIS). The purpose of WAMIS is to provide bibliographic references on topics of interest in the general area of natural resource management.

Research on the effects of land management practices on natural resources is the primary topic covered by WAMIS. The initial core of references in WAMIS came from a literature review on water yield improvement potentials by vegetation management in Arizona. A user of WAMIS, after submitting a request for information, receives an individualized computer printout with a citation and abstract for each reference. This individualized bibliography provides sources of information on the topic of interest. There are no user restrictions.

This bibliography of citations and abstracts, WAMIS Abstract No. 3, provides a sample of the materials retrievable through WAMIS. WAMIS Abstracts No. 1, distributed in 1974, had references on the following topics: water yield as affected by vegetation management; characteristics of snowpack dynamics; research performed in ponderosa pine areas; and conversion as a management practice. WAMIS Abstracts No. 2, distributed in 1975, included references on three topics: wildlife habitats in wooded or shrub areas; burning effects on vegetation in Arizona and New Mexico; and water quality of surface water in the Rocky Mountain region. Three topics dealing with soil erosion have been chosen for inclusion in WAMIS Abstracts No. 3: forecasting soil erosion; mechanical or conservation practices for erosion control; and vegetal erosion controls. The references found in this bibliography are only a sample of those retrieved from each of the topical searches.

WAMIS primarily covers wildland management literature. However, research from cultivated lands relating to erosion control has also been included in WAMIS Abstracts No. 3.

The first search on forecasting soil erosion identifies studies dealing with the prediction of rates and amounts of erosion, either through the use of mathematical models or correlational techniques. One equation in particular, the Universal Soil Loss Equation, has become the basis for many studies that forecast the degree of erosion in a variety of situations.

The second search on mechanical erosion controls covers studies utilizing such erosion control methods as contour furrowing, mulching, terracing, tilling, drop basins, rock riprap, gully plugs, and concrete structures. These methods are applicable to a variety of erosional situations, such as gully erosion, streambank erosion, and sheet erosion.

The third search on vegetal erosion controls deals with the use of various types of vegetation in controlling soil erosion. Included are references on revegetation techniques, useful plant species, wind and shelter breaks, and dune and slope stabilization through plant cover establishment.

Citations are arranged by author within each sample search. The information given for each citation in the bibliography is arranged in the following order:

Author
Date
Title
Source
Abstract

Potential users of WAMIS are invited to correspond with the School of Renewable Natural Resources for further information regarding WAMIS or for submission of search requests.

Susan Allen
Gail S. Georgenson
Linda M. White

SEARCH TOPIC PAGE

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Mechanical or conservation practices
for erosion control 24

Vegetal erosion controls 47

FORECASTING SOIL EROSION

ANDERSON, H.W.

1975

SEDIMENTATION AND TURBIDITY HAZARDS IN WILDLANDS. IN SYMPOSIUM ON WATERSHED MANAGEMENT, LOGAN, UTAH, AUGUST 11-13, 1975, PROCEEDINGS, P. 347-376.

AMERICAN SOCIETY OF CIVIL ENGINEERS. AVAILABLE FROM NEW YORK OFFICE.

THIS PAPER FOCUSES ON A SYSTEM FOR SELECTING UNITS THAT MEASURE SEDIMENTATION AND WATER QUALITY, AND ALSO FOR DEFINING A UNIT AREA IN WHICH WATER QUALITY MIGHT BE MONITORED AND SEDIMENTATION PREDICTED. FIVE SUBSYSTEMS CHARACTERIZE THE BASIC SEDIMENT-PRODUCING POTENTIAL OF METEOROLOGICAL, GEOLOGIC, TOPOGRAPHIC, VEGETATIVE, AND LAND USE CONDITIONS. INFORMATION ABOUT INDICES OF SEDIMENT HAZARDS, PRODUCTION COEFFICIENTS THAT ALTER THOSE HAZARDS, AND TECHNIQUES FOR APPRAISING SEDIMENT POTENTIAL, DILUTION POTENTIAL OF STREAMS, AND DEPOSITION IN RESERVOIRS IS BROUGHT TOGETHER HERE. THE EFFECTS OF FOREST FIRES, CONVERSION OF STEEP FOREST OR BRUSHLAND TO GRASS, AND UNSTABLE STREAM CHANNELS ARE EXPLORED FOR THEIR EFFECTS ON SEDIMENTATION. 45 REFERENCES.

BALI, J.S./MILDNER, W.F./NANDAA, H.S.

1972

HANDBOOK OF SEDIMENTATION.

INDIA, MINISTRY OF AGRICULTURE, CENTRAL UNIT FOR SOIL CONSERVATION (HYDROLOGY AND SEDIMENTATION). 296 P.

A BEGINNING IN THE DIRECTION OF SOIL CONSERVATION IN THE CATCHMENTS OF 13 SELECTED RESERVOIRS WAS MADE WITH THE INITIATION OF A CENTRALLY-SPONSORED SCHEME OF SOIL CONSERVATION IN THE THIRD PLAN PERIOD IN INDIA. BY THE END OF THE FOURTH PLAN PERIOD THIS PROGRAM IS EXPECTED TO PROVIDE SOIL CONSERVATION TREATMENT FOR 1,163,000 HECTARES. THIS HANDBOOK IS DESIGNED TO ASSIST IN THE PREDICTION OF SEDIMENT YIELDS AND IS OF USE TO WORKERS ENGAGED IN WATERSHED MANAGEMENT ACTIVITIES; IDENTIFYING CRITICALLY ERODED AREAS; FOR DESIGNING ENGINEERING STRUCTURES SUCH AS CHECK DAMS AND DETENTION BASINS. REFERENCES AT END OF EACH CHAPTER.

BERTRAND, A.R./BARNETT, A.P./ROGERS, J.A.

1964

THE INFLUENCE OF SOIL PHYSICAL PROPERTIES ON RUNOFF, EROSION, AND INFILTRATION OF SOME SOILS IN THE SOUTHEASTERN U.S.

INTERNATIONAL CONGRESS OF SOIL SCIENCE, 8TH, BUCHAREST, 1964, TRANSACTIONS, VOLUME 2:663-667.

THE GRAIN-SIZE DISTRIBUTION, HUMIDITY FORMS, VOLUME WEIGHT, C CONTENT, THICKNESS, HUMIC LAYER, INFILTRATION, RUNOFF, AND EROSION OF 13 SOIL TYPES IN THE SOUTHEASTERN U.S. ARE STUDIED. A CLOSE CORRELATION WAS FOUND BETWEEN OVERALL INFILTRATION AND RUNOFF. EQUATIONS ARE DERIVED FOR CALCULATING RUNOFF AND EROSION FROM THE PHYSICAL PROPERTIES OF THE SOIL. 13 REFERENCES.

BOUYOUCOS, G.J.

1935

THE CLAY RATIO AS A CRITERION OF SUSCEPTIBILITY OF SOILS TO EROSION.

AMERICAN SOCIETY OF AGRONOMY, JOURNAL 27(9):738-741.

THE (SAND AND SILT) OVER CLAY RATIO IN SOILS, DESIGNATED AS THE CLAY RATIO, IS SUGGESTED AS A POSSIBLE CRITERION OF JUDGING THE RELATIVE SUSCEPTIBILITY OF SOILS TO EROSION. IT WAS COMPARED WITH AN EROSION RATIO PROPOSED BY MIDDLETON BY USING THE SAME SOILS AND THE SAME MECHANICAL ANALYSIS OF THESE SOILS AS REPORTED BY THE U.S. BUREAU OF CHEMISTRY AND SOILS. THE COMPARISON SHOWED THAT WITH FEW EXCEPTIONS THE TWO RATIOS AGREED FAIRLY WELL IN INDICATING SOIL SUSCEPTIBILITY. NINE REFERENCES.

BROOKS, F.L. ET AL

1974

UNIVERSAL SOIL LOSS EQUATION.

U.S. SOIL CONSERVATION SERVICE, WEST TECHNICAL SERVICE CENTER, PORTLAND, OREGON, TECHNICAL NOTES, CONSERVATION AGRONOMY 32. 27 P.

BASIC INFORMATION USED IN DERIVING GROUPINGS OF SOILS AND DELINEATING ZONES FOR R FACTOR (EROSIVE RAINFALL EFFECTS) AND RS FACTOR (EROSIVE EFFECTS OF SNOWMELT RUNOFF) FOR USE IN THE UNIVERSAL SOIL LOSS EQUATION INCLUDE SOIL MOISTURE REGIMES (UDIC, ARIDIC, USTIC, AND XERIC), SOIL TEMPERATURE REGIMES (HYPERTHERMIC, THERMIC, MESIC, FRIGID, AND CRYIC), AND SOIL MOISTURE-SOIL TEMPERATURE ZONES. THIS REPORT SERVES AS A GUIDE FOR OTHER STATES PREPARING TECHNICAL INFORMATION ON THE UNIVERSAL SOIL LOSS EQUATION. MAPS, GRAPHS, AND TABLES ARE INCLUDED. 0 REFERENCES.

BRUCE-OKINE, E./LAL, R.

1975

SOIL ERODIBILITY AS DETERMINED BY RAINDROP TECHNIQUE.

SOIL SCIENCE 119(2):149-157.

AGGREGATES OF TWO TROPICAL SOILS FROM WESTERN NIGERIA WERE USED TO INVESTIGATE THE POSSIBILITY OF USING THE RAINDROP TECHNIQUE TO DETERMINE THE SOIL ERODIBILITY INDEX AS COMPARED WITH SOIL BEHAVIOR TOWARDS EROSION UNDER NATURAL FIELD CONDITIONS. AGGREGATE SIZE, INITIAL SOIL MEASUREMENT POTENTIAL, AND RAINDROP TEMPERATURE WERE TESTED FOR THEIR EFFECT ON STRUCTURAL STABILITY OF THE SOILS. HIGH SOIL MOISTURE POTENTIAL (MORE NEGATIVE) SIGNIFICANTLY INCREASED THE ERODIBILITY OF A CLAYEY SOIL CONTAINING EXPANDING LATTICE CLAY MINERALS. THE ERODIBILITY INDEX OF A SANDY CLAY LOAM SOIL CONTAINING KAOLINITIC CLAY MINERALS AND AMORPHOUS IRON AND ALUMINUM OXIDES WAS SLIGHTLY DECREASED WHEN AT HIGH MOISTURE POTENTIAL. THE INCREASE IN WATER TEMPERATURE INCREASED THE ERODIBILITY OF BOTH SOILS. ERODIBILITY WAS FOUND TO VARY DIRECTLY WITH SAND AND INVERSELY WITH CLAY CONTENT. A ROUTINE LABORATORY METHOD OF EVALUATING THE ERODIBILITY OF A SOIL USING A RATING CURVE IS PROPOSED. 24 REFERENCES.

BRYAN, R.B.

1968

THE DEVELOPMENT, USE AND EFFICIENCY OF INDICES OF SOIL ERODIBILITY.

GEODERMA 2(1):5-26.

AFTER A SURVEY OF THE INDEXES PROPOSED DURING THE LAST 30 YEARS FOR SOIL ERODIBILITY, THE VALIDITY OF EACH INDEX IS ASSESSED, AND THE RESULTS OF EXPERIMENTAL CHECKS ON ITS EFFECTIVENESS ARE REPORTED. THE CONCLUSION IS REACHED THAT NONE OF THE AVAILABLE INDEXES OF SOIL ERODIBILITY FULLY MEETS THE REQUIREMENTS. THEY SOULD BE EASILY MEASURABLE, DEPENDABLE IN USE, AND UNIVERSALLY APPLICABLE. ALTHOUGH IT IS DOUBTFUL THAT ANY SUCH INDEX CAN BE FOUND, THE STUDY OF RESISTANCE AND DISTRIBUTION OF SOIL AGGREGATES APPEARS TO BE MOST PROMISING. 37 REFERENCES.

CHEPIL, W.S.

1958

SOIL CONDITIONS THAT INFLUENCE WIND EROSION.

U.S. DEPARTMENT OF AGRICULTURE, AGRICULTURAL RESEARCH SERVICE, TECHNICAL BULLETIN 1185. 40 P.

DEGREE OF CLODDINESS, MECHANICAL STABILITY OF CLODS, PRESENCE OR ABSENCE AND STABILITY OF THE SURFACE CRUST, AND BULK DENSITY AND SIZE OF ERODIBLE SOIL FRACTIONS ARE SOME OF THE IMPORTANT PRIMARY SOIL FACTORS THAT INFLUENCE ERODIBILITY OF SOIL BY WIND. CHANGES IN THE STRUCTURAL FACTORS, AND CONSEQUENTLY IN ERODIBILITY, ARE BROUGHT ABOUT BY VARIOUS FIELD PRACTICES AND ENVIRONMENTAL CONDITIONS. TWO METHODS ARE USED TO CONTROL WIND EROSION. THE FIRST IS TO CREATE A SOIL CONDITION RESISTANT TO EROSION; THE SECOND IS TO SHELTER THE SOIL FROM WIND. BOTH LABORATORY AND FIELD EXPERIMENTS WERE UNDERTAKEN IN KANSAS AND COLORADO TO IDENTIFY AND ANALYZE ALL OF THE FACTORS INVOLVED IN SOIL SUSCEPTIBILITY TO WIND EROSION. AN EQUATION IS DERIVED THAT WILL ESTIMATE THE RELATIVE SOIL ERODIBILITY. WHEN COMPARED WITH NATURAL ERODIBILITY, IT WAS FOUND THAT THE PREDICTED VALUES ARE INDICES OF ERODIBILITY AND NOT THE ACTUAL QUANTITIES ERODIBLE UNDER FIELD CONDITIONS. 39 REFERENCES.

CHEPIL, W.S.

1960

CONVERSION OF RELATIVE FIELD ERODIBILITY TO ANNUAL SOIL LOSS BY WIND.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 24(2):143-145.

RELATIVE FIELD ERODIBILITY BASED ON MANY PREVIOUS WIND TUNNEL AND FIELD MEASUREMENTS IS MERELY AN INDEX OF THE QUANTITY OF SOIL LOSS THAT WOULD OCCUR UNDER CERTAIN CLIMATIC CONDITIONS. THIS PAPER, BASED ON ADDITIONAL MEASUREMENTS, SHOWS THE RELATIONSHIP BETWEEN THE RELATIVE FIELD ERODIBILITY AND THE QUANTITY OF SOIL LOSS AND PRESENTS A TABLE FOR CONVERTING THE RELATIVE FIELD ERODIBILITY, AS DETERMINED FROM SEVEN MAJOR FACTORS, TO SOIL LOSS IN TONS PER ACRE PER ANNUM AS WOULD OCCUR UNDER CLIMATIC CONDITIONS SUCH AS EXISTED IN THE VICINITY OF GARDEN CITY, KANSAS, DURING THE YEARS 1954 THROUGH 1956. 5 REFERENCES.

CHEPIL, W.S.

1960

HOW TO DETERMINE REQUIRED WIDTH OF FIELD STRIPS TO CONTROL WIND EROSION.

JOURNAL OF SOIL AND WATER CONSERVATION 15(2):72-75.

IN DETERMINING THE WIDTH OF FIELD STRIPS FOR WIND EROSION CONTROL, ONE MUST FIRST DETERMINE THE SUSCEPTIBILITY OF THE AREA TO EROSION. FACTORS FOR CONVERSION OF WIND TUNNEL ERODIBILITY TO NATURAL ERODIBILITY ON A FIELD-SCALE BASIS ARE GIVEN. THE REQUIRED FIELD WIDTH STRIP IS BASED ON THE TOLERABLE RATE OF SOIL FLOW TENTATIVELY SET AT ONE-TENTH THE POSSIBLE MAXIMUM RATE OF 2 TONS PER ROD WIDTH PER HOUR FOR A 40-MILE PER HOUR WIND VELOCITY AT A 50 FOOT HEIGHT. CHARTS ARE GIVEN TO AID IN THE CONVERSION OF ALL FACTORS INVOLVED. 3 REFERENCES.

DAVID, W.P./BEER, C.E.

1975

SIMULATION OF SOIL EROSION--PART I. DEVELOPMENT OF A MATHEMATICAL EROSION MODEL.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 18(1):126-129, 133.

AN EROSION MODEL WAS DEVELOPED WHERE THE BASIC INPUT WAS OVERLAND FLOW DEPTH (GENERATED BY WATERSHED MODEL) AND THE INTENSITY OF PRECIPITATION. EQUATIONS EXPRESSING SOIL EROSION FROM STREAM BANKS, IMPERVIOUS SURFACES AND RAINDROP SPLASH WERE DEVELOPED. THE CARRYING CAPACITY OF THE OVERLAND FLOW WAS CONTINUOUSLY EVALUATED TO DETERMINE WHETHER SOIL PARTICLES WERE BEING REMOVED AND TRANSPORTED FROM STORAGE OR DEPOSITED. 21 REFERENCES.

DAVID, W.P./BEER, C.E.

1975

SIMULATION OF SOIL EROSION--PART II. STREAMFLOW AND SUSPENDED SEDIMENT SIMULATION RESULTS.

AMERICAN SOCIETY OF AGRICULTURE ENGINEERS, TRANSACTIONS 18(1):130-133.

THE KENTUCKY WATERSHED MODEL (A MODIFIED VERSION OF THE STANFORD WATERSHED MODEL) WAS ADAPTED TO IOWA CONDITIONS AND USED IN CONJUNCTION WITH THE SHEET EROSION MODEL IN ORDER TO SIMULATE SHEET EROSION FROM AGRICULTURAL WATERSHEDS. ON THE BASIS OF THE RESULTS, THE FOLLOWING CONCLUSIONS CAN BE MADE: 1) OCCURRENCE OF SNOWMELT IS A PROBLEM AND A SOUND SNOWMELT SUBROUTINE MUST BE INCLUDED IN THE MODEL, 2) SHEET EROSION MODEL AND KENTUCKY WATERSHED MODEL CANNOT BE APPLIED TO LARGE WATERSHEDS AS IT IS NOT POSSIBLE TO OBTAIN REPRESENTATIVE HOURLY OVERLAND FLOWS, 3) A GREAT AMOUNT OF TIME IS REQUIRED TO BECOME ACQUAINTED WITH THE MODELS, AND 4) SUFFICIENT PARAMETERS TO DEFINE SEASONAL EFFECT ON SHEET EROSION ARE LACKING. 8 REFERENCES.

DISSMEYER, G.E.

1973

EVALUATING THE IMPACT OF INDIVIDUAL FOREST MANAGEMENT PRACTICES ON SUSPENDED SEDIMENT.

SOIL CONSERVATION SOCIETY OF AMERICA, PROCEEDINGS 28: 258-264.

A TECHNIQUE FOR EVALUATING LAND MANAGEMENT WITH RESPECT TO WATER QUALITY INSOFAR AS IT IS AFFECTED BY SUSPENDED SEDIMENT IS CALLED FIRST APPROXIMATION OF SUSPENDED SEDIMENT (FASS'. IT PROVIDES A MEANS OF IDENTIFYING THE CAUSES OF WATER QUALITY PROBLEMS AND IDENTIFYING AND EVALUATING LAND MANAGEMENT CHANGES NEEDED TO MEET WATER QUALITY STANDARDS. IN ADDITION, IT CAN PREDICT THE CONSEQUENCES OF ANY PROPOSED ACTIVITY. FASS DISTRIBUTES MEASURED SEDIMENT YIELD, EITHER SUSPENDED SEDIMENT OR RESERVOIR SEDIMENTATION DATA, AMONG THE LAND USES AND DISTURBANCES ABOVE THE POINT OF MEASUREMENT AND INCLUDES STEPS SUCH AS STRATIFYING THE STUDY AREA USING FACTORS LIKELY TO AFFECT EROSION AND SEDIMENT YIELDS SUCH AS SOILS, SLOPE, OR VEGETATION, AND THEN FIELD SAMPLING THE STRATA FOR EROSION AND SEDIMENT PRODUCTION. 9 REFERENCES.

DRIELSMA, A.B.H.

1970

A FIELD STUDY OF SOIL ERODIBILITY IN RELATION TO AGRONOMIC PRACTICES AND CERTAIN SOIL PHYSICAL PROPERTIES.

CORNELL UNIVERSITY (PH.D. DISSERTATION). 199 P.

THE MOST USEFUL SOIL LOSS PREDICTION EQUATION FOR EROSION CONTROL PLANNING ON FARM LAND IN THE EASTERN UNITED STATES HAS BEEN APPLIED TO THE CONDITIONS OF 90 EROSION PLOTS WITH LOW SLOPE GRADIENTS. THE LEVEL OF THE SOIL LOSSES WAS MUCH LOWER THAN THAT OF THE PREDICTED SOIL LOSSES. IT WAS FOUND THAT THE RATIOS OF SOIL LOSSES, DUE TO THE EFFECTS OF PRIOR CROPPING SYSTEMS, DID NOT ALWAYS CORRESPOND TO THE SOIL LOSS RATIOS REPORTED IN THE LITERATURE. THE CROPPING SOIL LOSS RATIOS FOR THE CONDITIONS OF THE EXPERIMENTAL FIELD WERE THEREFORE COMPUTED, ASSUMING AN EQUAL INHERENT SOIL ERODIBILITY FOR THE EXPERIMENTAL PLOTS. IT WAS FOUND THAT CONTINUOUS HAY DECREASES SOIL ERODIBILITY MOST. CROP RESIDUES, MANURE AND FERTILIZER APPLICATION AFFECT THE ERODIBILITY INSOFAR THAT LARGE QUANTITIES OF RESIDUES AND MANURE AND SMALL FERTILIZER RATES DECREASE SOIL ERODIBILITY. THE EFFECT OF MANURE ON SOIL LOSSES AND AGGREGATION WAS FOUND TO BE SMALL FOR ROTATIONS OF ALFALFA, CORN, AND SMALL GRAINS. PREDICTABILITY OF SOIL LOSSES WITHIN A CROPPING SYSTEM WAS FOUND TO BE HIGHER THAN PREDICTABILITIES BASED UPON ANALYSIS OF SOIL DATA FROM ALL CROPPING SYSTEMS CONSIDERED.

FARRELL, D.A./MOLDENHAUER, W.C./LARSON, W.E.

1974

SPLASH CORRECTION FACTORS FOR SOIL EROSION STUDIES.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 38(3):510-514.

MANY RESEARCH WORKERS HAVE MEASURED SOIL AND SAND SPLASH FROM IMPACTING WATER DROPS OR RAINDROPS. SIZE AND SHAPE OF THE SOIL CONTAINERS IN THESE STUDIES HAVE VARIED. A THEORETICAL STUDY WAS MADE TO DETERMINE THE POSSIBLE EFFECT OF THE GEOMETRIC PARAMETERS ON THE MEASUREMENT OF SOIL SPLASH. THE RESULTS SHOW THAT ESTIMATES OF SOIL DETACHMENT BY RAINDROP IMPACT COULD BE SUBSTANIALLY AFFECTED BY THE SIZE AND SHAPE OF THE CONTAINER. 10 REFERENCES.

FOGEL, M.M.

1975

ESTIMATING STORM RUNOFF FROM SMALL WATERSHEDS. IN J.L. THAMES AND J.N. FISCHER, WATERSHED MANAGEMENT IN ARID ZONES, P. 166-175.

UNIVERSITY OF ARIZONA, SCHOOL OF RENEWABLE NATURAL RESOURCES, TUCSON. 302 P.

THIS PAPER DISCUSSES THE U.S. SOIL CONSERVATION SERVICE METHOD FOR ESTIMATING WATER AND SEDIMENT YIELDS FROM A SMALL UNGAGED WATERSHED. A WATERSHED INDEX W, SOMETIMES CALLED A RUNOFF CURVE NUMBER, DEPENDS ON SOIL TYPE, GENERAL HYDROLOGIC CONDITION OF THE AREA, NATURE AND EXTENT OF COVER AND THE ANTECEDENT MOISTURE CONDITION AT THE START OF THE STORM PERIOD WHICH PRODUCES RUNOFF. SPECIFIC PROCEDURES FOR USING THIS INDEX IN CONJUNCTION WITH A BASIC RAINFALL-RUNOFF EQUATION ARE PRESENTED. A PROCEDURE FOR PREDICTING ANNUAL SEDIMENT YIELD FROM CLIMATE AND TOPOGRAPHY, AND SECOND, A MEANS FOR ESTIMATING LOSS OF SOIL BY EROSION FROM AN INDIVIDUAL STORM ARE BOTH PRESENTED. 5 REFERENCES.

GIFFORD, G.F.

1972

INFILTRATION RATE AND SEDIMENT PRODUCTION TRENDS ON A PLOWED BIG SAGEBRUSH SITE.

JOURNAL OF RANGE MANAGEMENT 25:53-55.

A STUDY WAS CONDUCTED IN IDAHO TO DETERMINE THE INFLUENCE OF PLOWING SAGEBRUSH ON SURFACE RUNOFF AND SEDIMENT PRODUCTION, USING INFILTROMETER TESTS. THE TREND WAS TOWARD LOWERED INFILTRATION RATES FOLLOWING PLOWING AND SEEDING OF A BIG SAGEBRUSH SITE. THE GREATEST DECLINE OCCURRED DURING THE FALL PERIOD OF THE SECOND YEAR FOLLOWING TREATMENT. SEDIMENT PRODUCTION RATES INCREASED FOLLOWING PLOWING, BUT YIELDS WERE VARIABLE. THE ABILITY TO PREDICT INFILTRATION RATES USING COVER CHARACTERISTICS ALONE IN MULTIPLE REGRESSION EQUATIONS VARIED WITH TIME, BOTH WITHIN A GIVEN STORM EVEN AND ALSO ON A SEASONAL BASIS. ABILITY TO PREDICT INFILTRATION RATES WAS NOT PARTICULARLY AFFECTED BY THE PLOWING TREATMENT. FIVE REFERENCES.

KINNELL, P.I.A.

1973

THE PROBLEM OF ASSESSING THE EROSIVE POWER OF RAINFALL FROM METEOROLOGICAL OBSERVATIONS.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 37(4):617-621.

A NUMBER OF RAINFALL PARAMETERS HAVE BEEN PROPOSED IN THE PAST AS BASES FOR INDEXES OF EROSIVITY. VALUES WERE CALCULATED AND RELATIONSHIPS BETWEEN RAINFALL INTENSITY AND THE PARAMETER VALUES WERE DEVELOPED. BOTH RAINTYPE AND GEOGRAPHICAL LOCATION INFLUENCED THE PARAMETERS. THE ORDERING OF FIVE RAINTYPES AT MIAMI, FLORIDA, DETERMINED BY VALUES OBTAINED AT GIVEN RAINFALL INTENSITY FROM THE INTENSITY-PARAMETER REGRESSIONS FOR MOMENTUM AND KINETIC ENERGY WAS REVERSED FOR KINETIC ENERGY PER UNIT HORIZONTAL AREA OF THE DROP. THEREFORE, IT IS NOT POSSIBLE AT PRESENT TO CLASSIFY THE RAINTYPES AT A GEOGRAPHIC LOCATION ACCORDING TO THEIR DETACHMENT POWER. 26 REFERENCES.

LEAF, C.F.

1966

SEDIMENT YIELDS FROM HIGH MOUNTAIN WATERSHEDS, CENTRAL COLORADO.

U.S. FOREST SERVICE, ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION, FORT COLLINS, COLORADO, RESEARCH PAPER RM-23. 15 P.

A STUDY OF ANNUAL SEDIMENT YIELDS FROM ONE CAREFULLY LOGGED AND TWO UNDISTURBED WATERSHEDS IN THE FRASER EXPERIMENTAL FOREST SHOWED GOOD CORRELATION BETWEEN PEAK STREAMFLOW AND ACCUMULATED SEDIMENT VOLUME. THE RELATIONSHIPS INDICATE THAT A MAJOR PART OF THE SEDIMENT LOAD IS DERIVED FROM CHANNEL EROSION. THE EFFECTS OF LOGGING ON SEDIMENT YIELDS ARE DISCUSSED, AND MAGNITUDE-FREQUENCY RELATIONSHIPS ARE DEVELOPED FOR ESTIMATING LONG-TERM SEDIMENT YIELDS. NINE REFERENCES.

LEAF, C.F.

1974

A MODEL FOR PREDICTING EROSION AND SEDIMENT YIELD FROM SECONDARY FOREST ROAD CONSTRUCTION.

U.S. FOREST SERVICE, ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION, FT. COLLINS, COLORADO, RESEARCH NOTE RM-274. 4 P.

ONE OF THE MORE VISIBLE AND CONTROVERSIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH TIMBER HARVESTING AND DEVELOPMENT IN CENTRAL COLORADO IS ROAD CONSTRUCTION. BETTER TOOLS ARE NEEDED TO QUANTIFY THE EFFECT OF SOIL DISTURBANCE ON EROSION ON-SITE, AND THE SUBSEQUENT YIELD OF SEDIMENT DOWNSTREAM. THE NOTE SUMMARIZES THE AVAILABLE DATA, AND FROM THIS BASE, PROPOSES A PRELIMINARY MODEL FOR PREDICTING AN INDEX OF ON-SITE EROSION AND DOWNSTREAM SEDIMENT YIELD. SEVEN REFERENCES.

LLOYD, C.H./ELEY, G.W.

1952

GRAPHICAL SOLUTION OF PROBABLE SOIL LOSS FORMULA FOR THE NORTHEASTERN REGION.

JOURNAL OF SOIL AND WATER CONSERVATION 7(4):189-191.

DATA NECESSARY FOR USING THE GRAPHICAL SOLUTION TO PROBABLE SOIL LOSS FORMULA HAVE BEEN COMPILED INTO DOCUMENTS. A SAMPLE DOUCMENT IS REPRODUCED CONTAINING EXAMPLES FOR USE OF SOIL LOSS FORMULA. USE OF THE GRAPHICAL SOLUTION TO PROBABLE SOIL LOSS ALLOWS COMPARISON OF CROPPING SYSTEMS AND CONSERVATION MATTERS. 0 REFERENCES.

MARSHALL, J.K.

1970

ASSESSING THE PROTECTIVE ROLE OF SHRUB-DOMINATED RANGELAND VEGETATION AGAINST SOIL EROSION BY WIND.

INTERNATIONAL GRASSLAND CONGRESS, 11TH, 1970, PROCEEDINGS, P. 19-23.

IN THE SEMIARID REGION OF SOUTHERN WINTER-RAINFALL AUSTRALIA A MAJOR PHYSIOGRAPHIC VEGETATION TYPE IS CHENOPODIACEOUS SHRUB-DOMINATED RANGELAND. WITH REDUCTION OF SHRUB COVER, SOIL EROSION BY WIND CAN BECOME A PROBLEM. A MAJOR DIFFICULTY IN ASSESSING THE SUSCEPTIBILITY OF AN AREA TO WIND EROSION IS THE ESTIMATION OF THE PROTECTION PROVIDED BY THESE SHRUBS. PHYSICAL CRITERIA ARE PRESENTED WHEREBY THIS PROTECTION CAN BE ASSESSED. THE MODEL USED IS SUPPORTED BY RESULTS FROM A WIND-TUNNEL STUDY AND FROM FIELD MEASUREMENTS IN A COTTONBUSH (KOCHIA APHYLLA) DOMINATED COMMUNTY. IMPLICATIONS FOR MANAGEMENT OF SHRUB-DOMINATED RANGELANDS ARE DISCUSSED. NINE REFERENCES.

MCVICKAR, J.S.

1954

THE PROBLEM AREA AS A BASIS FOR DEVELOPING A SOIL EROSION MAP.

JOURNAL OF SOIL AND WATER CONSERVATION 9(6):251-254.

BY ANALYSIS OF THE ACCUMULATED DATA IN AN AREA OR STATE, THE DISTRIBUTION OF EROSION CAN BE DETERMINED. THE METHOD REPORTED OFFERS A FAIRLY QUICK AND ECONOMICAL MEANS OF APPRAISING THE OVERALL EROSION FOR A REGION. BY EXTRAPOLATION OF DATA COLLECTED IN PROBLEM AREAS MAPPED TO LIKE PROBLEM AREAS NOT MAPPED, THE METHOD CAN PROVIDE A BASIS FOR DETERMINING THE MAGNITUDE OF THE CONSERVATION NEEDS TO BE MET IN DIFFERENT PROBLEM AREAS OF MICHIGAN, THE STATE ON WHICH THE METHOD WAS APPLIED. THE SAMPLING PROCEDURE DESCRIBED INVOLVES USE OF PREEXISTING MAPS AND THEIR ANALYSIS. 2 REFERENCES.

MEEUWIG, R.O.

1970

INFILTRATION AND SOIL EROSION AS INFLUENCED BY VEGETATION AND SOIL IN NORTHERN UTAH.

JOURNAL OF RANGE MANAGEMENT 23(3):185-188. SWRA W71-04260.

THE INFLUENCE OF VEGETATION, SOIL PROPERTIES, AND SLOPE GRADIENT ON INFILTRATION CAPACITY AND SOIL STABILITY OF HIGH ELEVATION HERBLAND IN UTAH WERE INVESTIGATED UNDER SIMULATED RAINFALL CONDITIONS. THE RESULTS EMPHASIZED THE IMPORTANCE OF VEGETATION AND LITTER COVER IN MAINTAINING INFILTRATION CAPACITY AND SOIL STABILITY. INFILTRATION WAS ALSO AFFECTED SIGNIFICANTLY BY SOIL PROPERTIES, NOTABLY BULK DENSITY, AGGREGATION, AND MOISTURE CONTENT. QUANTITATIVE CRITERIA WAS DEVELOPED FOR ESTIMATING SITE BY SITE INFILTRATION AND EROSIONAL BEHAVIOR OF HIGH ELEVATION WATERSHEDS OF COMPARABLE RAINFALL AND A BASIS FURNISHED FOR COMPARING THE RELATIVE FLOOD AND EROSION POTENTIALS OF DIFFERENT SITES. SEVEN REFERENCES.

MEGAHAN, W.F.

1974

EROSION OVER TIME ON SEVERELY DISTURBED GRANITIC SOILS: A MODEL.

U.S. FOREST SERVICE, INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION, OGDEN, UTAH, RESEARCH PAPER INT-156. 14 P.

A NEGATIVE EXPONENTIAL EQUATION CONTAINING THREE PARAMETERS WAS DERIVED TO DESCRIBE TIME TRENDS IN SURFACE EROSION ON SEVERELY DISTURBED SOILS. DATA FROM FOUR DIFFERENT STUDIES OF SURFACE EROSION ON ROADS CONSTRUCTED FROM THE GRANITIC MATERIAL FOUND IN THE IDAHO BATHOLITH WERE USED TO DEVELOP EQUATION PARAMETERS. RAINFALL-INTENSITY DATA WERE USED TO ILLUSTRATE THAT VARIATIONS IN EROSION FORCES, AS INDEXED BY RAINFALL KINETIC ENERGY TIMES THE MAXIMUM 30-MINUTE RAINFALL INTENSITY (THE ERODIBILITY INDEX), WERE NOT THE CAUSE OF THE TIME TREND IN SURFACE EROSION. IN ADDITION, ALTHOUGH VEGETATION GROWTH CAN BE AN IMPORTANT FACTOR IN REDUCING ACCELERATED EROSION, IT DID NOT CAUSE THE RAPID EROSION DECREASE FOUND IN THE CASES STUDIED. THE EVIDENCE SUGGESTS THE SURFACE ARMORING WAS THE DOMINANT FACTOR CAUSING THE TIME TRENDS IN SURFACE EROSION. THE SIGNIFICANCE OF TIME TRENDS IN SURFACE EROSION IS DISCUSSED. 16 REFERENCES.

MEYER, G.J./SCHOENEBERGER, P.J./HUDDLESTON, J.H.

1975

SEDIMENT YIELDS FROM ROADSIDES: AN APPLICATION OF THE UNIVERSAL SOIL LOSS EQUATION.

JOURNAL OF SOIL AND WATER CONSERVATION 30(6):289-291.

RATES OF EROSION WERE ESTIMATED FROM A NUMBER OF NONVEGETATED ROADSIDES IN WISCONSIN BY DETERMINING ROADCUT GEOMETRY AND SUBSTITUTING FOR PARAMETERS IN THE UNIVERSAL SOIL LOSS EQUATION. AVERAGE RATE OF EROSION FROM 104 SEPARATE SITES WAS 354 TONS OF SOIL PER ACRE PER YEAR. THE ESTIMATE WAS VERIFIED BY MEASURING SEDIMENT YIELD FROM PLOTS ESTABLISHED ON SELECTED ROADSIDES. DIFFERENCES IN ERODIBILITY BETWEEN SURFACE SOILS AND SUBSOILS, VARIATIONS ASSOCIATED WITH THE LENGTH OF THE SAMPLING PERIOD, AND VARIATIONS IN RAINFALL PATTERNS ACCOUNTED FOR THE DIFFERENCES BETWEEN MEASURED AND PREDICTED EROSION RATES. 13 REFERENCES.

MEYER, L.D./KRAMER, L.A.

1969

EROSION EQUATIONS PREDICT LAND SLOPE DEVELOPMENT.

AGRICULTURAL ENGINEERING 50(9):522-523.

THREE SOIL LOSS PREDICTION EQUATIONS RELATING SLOPE STEEPNESS AND LENGTH TO TOTAL EROSION WERE STUDIED ON 4 SLOPE SHAPES USING A DIGITAL COMPUTER. AT STEEPNESS AVERAGING 10 PERCENT SLOPE SHAPES CHANGED ABOUT TWICE AS FAST AS THE SAME SHAPES AT 5 PERCENT, BUT SEDIMENT LOADS FOR 5 AND 10 PERCENT STEEPNESSES WERE NEARLY THE SAME AT EQUIVALENT ELEVATIONS DOWNSLOPE. A MODERATELY STEEP SLOPE WITH A FLATTENED PORTION FOR DEPOSITIONS AT THE END MAY THEREFORE BE PREFERABLE TO A LESS STEEP, LONGER SLOPE WITH NO FLATTENED PORTION. THESE RESULTS MAY BE APPLIED IN DETERMINING LOCATIONS FOR EROSION CONTROL MEASURES, IDENTIFYING MAJOR SEDIMENT SOURCES, AND IN CONSTRUCTION SITES. 0 REFERENCES.

MEYER, L.D./WISCHMEIER, W.H.

1969

MATHEMATICAL SIMULATION OF THE PROCESS OF SOIL EROSION BY WATER.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 12(6): 754-758.

REVIEWS BRIEFLY THE HISTORY OF MATHEMATICAL MODELS FOR EVALUATING EROSION SYSTEMS. PROPOSED MATHEMATICAL MODEL OF EROSION-SEDIMENTATION CONSIDERS THE RELATIVE CONTRIBUTIONS OF FOUR SUBPROCESSES AND DESCRIBES SOIL MOVEMENT AT LOCATIONS ALONG A SLOPE. THIS APPROACH TREATED 1) SOIL DETACHMENT BY RAINFALL, 2) TRANSPORT BY RAINFALL, 3) DETACHMENT BY RUNOFF, AND 4) TRANSPORT BY RUNOFF AS SEPARATE BUT INTERRELATED PARTS OF THE SOIL EROSION PROCESS. WHEN PERFECTED, THIS MODEL WILL PROVIDE INFORMATION FOR DESIGNING EROSION CONTROL TECHNIQUIES. 6 REFERENCES.

MILDNER, W.F./BALI, J.S./NANDAA, H.S.

1973

PROCEDURE FOR DETERMINING RATES OF LAND DAMAGE, LAND DEPRECIATION AND VOLUME OF SEDIMENT PRODUCED BY GULLY EROSION.

INDIA, MINISTRY OF AGRICULTURE, CENTRAL UNIT FOR SOIL CONSERVATION (HYDROLOGY AND SEDIMENTATION), TECHNICAL SERIES 4. 26 P.

THE PROCEDURES SET FORTH HERE ARE THE MINIMUM TECHNICAL STANDARDS WHICH SHOULD BE USED TO PREDICT THE FUTURE RATE OF DEVELOPMENT OF AN EXISTING GULLY AND TO ESTIMATE THE AREA OF LAND VOIDED AND THE LOCATION AND AREA OF LAND DEPRECIATED. THIS METHOD IS APPLICABLE TO MOST OF INDIA EXCEPT ARID AREAS. GRAPHS ARE INCLUDED. 2 REFERENCES.

MILDNER, W.F./BALI, J.S./NANDAA, H.S.

1973

SEDIMENT YIELD--PREDICTED VS. MEASURED.

INDIA, MINISTRY OF AGRICULTURE, CENTRAL UNIT FOR SOIL CONSERVATION (HYDROLOGY AND SEDIMENTATION), TECHNICAL SERIES 3. 18 P.

A RESEARCH FARM AT DEHRA DUN WAS CHOSEN IN AN EFFORT TO PROVE THE RELIABILITY OF THE UNIVERSAL SOIL LOSS EQUATION. THE SEDIMENT PREDICTED BY THE EQUATION TO BE IN THE RESERVOIR WAS COMPARED TO THE AMOUNT WHICH HAD BEEN ACTUALLY MEASURED. THE PRODUCT OF THE SOIL LOSS EQUATION IS EROSION WHICH OCCURS ON THE SPOT, NOT ALL OF WHICH REACHES THE TANK AS SEDIMENT DEPOSITS, WHICH ARE NOT DIRECTLY COMPARABLE TO EROSION. EROSION WAS CONVERTED TO SEDIMENT DEPOSITED IN THE RESERVOIR USING TECHNIQUES DESCRIBED IN AN EARLIER HANDBOOK. THE DELIVERY RATE OF THIS CATCHMENT WAS ESTIMATED TO BE 48 PERCENT WHICH IS TOLERABLE. SOME SMALL ERRORS WERE MADE WHICH MAY CAUSE THE CAPACITY MEASUREMENT TO BE OFF BY AS MUCH AS 10 PERCENT. 7 REFERENCES.

MUSGRAVE, G.W.

1974

THE QUANTITATIVE EVALUATION OF FACTORS IN WATER EROSION--A FIRST APPROXIMATION.

JOURNAL OF SOIL AND WATER CONSERVATION 2(3): 133-138.

REVIEWS MAJOR FACTORS INFLUENCING RATE OF EROSION, INCLUDING RAINFALL, FLOW CHARACTERISTICS (SLOPE DEGREE AND LENGTH), SOIL CHARACTERISTICS, AND VEGETAL COVER. ALL DATA, HAVING TO DO WITH THE RELATIONSHIP OF THESE MAJOR FACTORS TO THE RATE OF EROSION WERE ASSEMBLED AND ANALYZED BY RESEARCH WORKERS OF THE SOIL CONSERVATION SERVICE. TABLES OF RESULTS ARE PROVIDED IN WHICH THE RATES OF LOSS PER YEAR FOR CONTINUOUS ROW CROPS WITH THEIR RESPECTIVE PREVAILING SLOPES AND RAINFALL HAVE BEEN EQUATED TO EQUIVALENT RATES ON LIKE SLOPES AND WITH LIKE RAINFALL. RESULTS PERMIT COMPARISON OF SOILS WHICH HAVE NOT BEEN SUBJECTED TO DIRECT MEASUREMENT OF EROSION RATE, WITH A SOIL OF SIMILAR PHYSICAL PROPERTIES WHOSE RATES OF SOIL LOSS HAVE BEEN DETERMINED EXPERIMENTALLY OVER A PERIOD OF YEARS. 19 REFERENCES.

NICOL, K.J./HEADY, E.O./MADSEN, H.C.

1974

MODELS OF SOIL LOSS, LAND AND WATER USE, SPATIAL AGRICULTURAL STRUCTURE, AND THE ENVIRONMENT.

IOWA STATE UNIVERSITY, CENTER FOR AGRICULTURAL AND RURAL DEVELOPMENT, AMES, IOWA. CARD REPORT 49T. 232 P.

THIS REPORT SUMMARIZES THE NATURE AND RESULTS OF A MODEL WHICH EMPHASIZES ALTERNATIVES AND POTENTIAL GOALS IN SOIL LOSS CONTROL AS ONE MEANS OF ENVIRONMENTAL IMPROVEMENT. THE MODEL ALSO EVALUATES ALTERNATIVES IN LAND USE, IRRIGATION WATER ALLOCATION, FARMING TECHNOLOGIES, AND EXPORT POTENTIALS AS THESE AFFECT FOOD SUPPLIES, FARM PRICES, CONSUMER FOOD COSTS, FOREIGN MARKET POSSIBILITIES, AND GENERAL GOALS IN RESOURCE PRODUCTIVITY AND ENVIRONMENTAL IMPROVEMENT. RESULTS INDICATE THAT AGRICULTURE CAN MEET PRESENT AND EXPANDED LEVELS OF DEMAND WHILE MAINTAINING A GROSS FIELD LOSS OF SOIL SET AT A LEVEL BELOW 5 TONS PER ACRE. 38 REFERENCES.

OLSON, T.C./WISCHMEIER, W.H.

1963

SOIL-ERODIBILITY EVALUATIONS FOR SOILS ON THE RUNOFF AND EROSION STATIONS.

SOIL SCIENCE SOCIETY, PROCEEDINGS 27(5): 590-592.

UNIVERSAL SOIL-LOSS ESTIMATING EQUATION IS PRESENTED AS A EQUALS RKLSCP, WHERE A IS ESTIMATED SOIL LOSS, R IS RAINFALL-EROSION INDEX, K IS SOIL-ERODIBILITY FACTOR, AND L, S, C, P ARE FACTORS FOR LENGTH, PERCENT SLOPE, COVER, AND MECHANICAL CONSERVATION PRACTICES, RESPECTIVELY. VALUE OF SOIL-ERODIBILITY FACT (K) WAS APPROXIMATED FOR TWENTY SOIL TYPES REPRESENTED BY RUNOFF AND EROSION RESEARCH STATIONS LOCATED IN THE EASTERN UNITED STATES. ESTIMATED VALUES WERE COMPUTED FROM PLOT DATA, USING ONLY PLOTS WHOSE CONDITIONS APPROXIMATED BASE CONDITIONS OF COVER AND GEOMETRY. OBSERVED SOIL LOSSES FROM CROPPED PLOTS WERE ADJUSTED TO FOLLOW CONDITIONS BY USE OF PREVIOUSLY PUBLISHED NUMERICAL VALUES OF C AND P. TABLES OF K VALUES ARE PROVIDED FOR ESTIMATING ERODIBILITY OF OTHER SOILS. 10 REFERENCES.

ONSTAD, C.A./FOSTER, G.R.

1975

EROSION MODELING ON A WATERSHED.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 18(2):288-292.

AN EROSION-DEPOSTION MODEL IS DESCRIBED BASED ON A MODIFIED FORM OF THE UNIVERSAL SOIL LOSS EQUATION INCORPORATING HYDROLOGIC VARIABLES. THE SEDIMENT YIELD CONCEPT AND COMPUTATIONS INVOLVE CALCULATING SOIL DETACHMENT POTENTIAL AND TRANSPORT POTENTIAL ON STORM BY STORM BASIS AND THEN COMPARING THE TWO, RESULTING IN SEDIMENT YIELDS AND DEPOSITION. A PROCEDURE FOR ESTIMATING THE RELATIVE CONTRIBUTIONS OF RILL AND INTERRILL EROSION IS ALSO PRESENTED. FINAL RESULT IS AN ESTIMATE OF THE RILL AND INTERRILL EROSION DISTRIBUTION ON A WATERSHED. THE MODEL WAS USED TO SIMULATE THE SOIL MOVEMENT DURING 11 STORMS ON TWO MIDWEST WATERSHEDS PLANTED TO CONTOUR CORN. PREDICTIONS ON THE 82 ACRE IOWA WATERSHED WERE BETTER THAN THOSE ON THE SMALLER 1-ACRE OHIO WATERSHED. 7 REFERENCES.

RENARD, K.G./SIMANTON, J.R./OSBORN, H.B.

1974

APPLICABILITY OF THE UNIVERSAL SOIL LOSS EQUATION TO SEMIARID RANGELAND CONDITIONS. IN HYDROLOGY AND WATER RESOURCES IN ARIZONA AND THE SOUTHWEST, 4:18-32.

AMERICAN WATER RESOURCES ASSOCIATION, ARIZONA SECTION/ARIZONA ACADEMY OF SCIENCE, HYDROLOGY SECTION, PROCEEDINGS OF THE 1974 MEETINGS, FLAGSTAFF, ARIZONA.

SEDIMENT DATA COLLECTED FROM 4 AREAS IN THE WALNUT GULCH EXPERIMENTAL WATERSHED IN ARIZONA WITH DIFFERING CHANNEL ERODIBILITY WERE COMPARED TO SEDIMENT YIELDS PREDICTED BY THE UNIVERSAL SOIL LOSS EQUATION. THESE COMPARISONS INDICATED THAT THE PREDICTED SEDIMENT YIELDS AGREED CLOSELY WITH ACTUAL YIELDS FROM THE WATERSHED WITHOUT ERODIBLE CHANNELS. HOWEVER, PREDICTED SEDIMENT YIELDS WERE MUCH LOWER THAN ACTUAL FROM THE WATERSHED WITH ERODIBLE CHANNELS. AN ADDITIONAL TERM WAS INCLUDED IN THE UNIVERSAL SOIL LOSS EQUATION TO DESCRIBE THE EFFECT OF THE ERODIBLE CHANNEL ON SEDIMENT YIELDS. THE UTILITY OF THIS ADDITIONAL TERM WAS TESTED WITH DATA FROM TWO ADDITIONAL WATERSHEDS. RESULTS INDICATED THAT THIS TERM (TO DESCRIBE THE EFFECT OF AN ERODIBLE CHANNEL) IS NECESSARY TO IMPROVE SEDIMENT YIELD PREDICTION FROM SIMILAR SEMIARID RANGELAND WATERSHEDS. TEN REFERENCES.

RITCHIE, J.C./SPRABERRY, J.A./MCHENRY, J.R.

1974

ESTIMATING SOIL EROSION FROM THE REDISTRIBUTION OF FALLOUT CS(137).

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 38(1):137-139.

THE MOVEMENT OF FALLOUT CS(137) FROM SOILS IN THREE NORTH MISSISSIPPI WATERSHEDS WAS FOUND TO BE LOGARITHMICALLY (R= 0.89) RELATED TO POTENTIAL SOIL LOSS AS CALCULATED BY THE UNIVERSAL SOIL LOSS EQUATION. ANALYSIS OF OTHER PUBLISHED DATA ON CS(137) AS WELL AS THE NORTH MISSISSIPPI DATA SHOWED A SIGNIFICANT (R= 0.95) LOGARITHMIC RELATION EXISTING BETWEEN SOIL LOSS AND CS(137) LOSS FROM SOILS. THIS STUDYINDICATES THAT IT MAY BE POSSIBLE TO CALCULATE THE MOVEMENT OF SURFACE ADSORBED NUTRIENTS LIKE CS(137) IN WATERSHEDS FROM SOIL EROSION DATA. 18 REFERENCES.

RITCHIE, J.C./MCHENRY, J.R.

1975

FALLOUT CS-137: A TOOL IN CONSERVATION RESEARCH.

JOURNAL OF SOIL AND WATER CONSERVATION 30(6):283-285.

STUDIES REVIEWED HERE SHOW THAT THE CS-137 LOSS FROM WATERSHEDS CORRELATES LOGARITHMICALLY WITH SOIL LOSS, AS CALCULATED BY THE UNIVERSAL SOIL LOSS EQUATION AND MEASURED FROM SMALL RUNOFF PLOTS. THE DISTRIBUTION OF CS-137 IN VERTICAL PROFILES OF SEDIMENT DEPOSITED IN IMPOUNDMENTS OR FLOODPLAINS CAN BE CORRELATED WITH YEARLY ATMOSPHERIC FALLOUT RATES. THIS TECHNIQUE CAN BE USED TO DETERMINE SEDIMENTATION RATES IN IMPOUNDMENTS OR FLOODPLAINS FOR WHICH OTHER RECORDS ARE UNAVAILABLE. 34 REFERENCES.

ROTH, C.B./NELSON, D.W./ROMKENS, M.J.M.

1974

PREDICTION OF SUBSOIL ERODIBILITY USING CHEMICAL, MINERALOGICAL AND PHYSICAL PARAMETERS.

INDIANA AGRICULTURAL EXPERIMENT STATION. 125 P. AVAILABLE NTIS AS PB-239 442-7WN.

A MULTIPLE LINEAR REGRESSION EQUATION AND NOMOGRAPH WERE DEVELOPED WHICH CAN BE USED TO ESTIMATE THE ERODIBILITY FACTOR, K, OF MANY HIGH CLAY SUBSOILS. THE SUBSOIL ERODIBILITY NOMOGRAPH USES TERMS INVOLVING SOIL PARTICLE SIZE DISTRIBUTION AND THE AMOUNT OF AMORPHOUS HYDROUS OXIDES OR IRON, ALUMINUM, AND SILICON IN THE SOIL. MULTIPLE REGRESSION ANALYSIS REVEALED THE AMORPHOUS IRON, ALUMINUM AND SILICON HYDROUS OXIDES SERVE AS SOIL STABILIZERS IN SUBSOILS, WHEREAS ORGANIC MATTER IS THE MAJOR STABILIZER IN SURFACE SOILS. EVIDENCE IS PRESENTED TO SHOW THAT SOIL ERODIBILITY FROM SEMI-COMPACTED FILL AND SCALPED SUBSOIL SURFACE CONDITIONS WERE ESSENTIALLY IDENTICAL. IT IS REPORTED THAT THE SCALPED CONDITION IS THE BEST STANDARD SOIL SURFACE ON WHICH TO BASE THE CALCULATION OF THE ERODIBILITY FACTOR FOR SUBSOILS.

SKIDMORE, E.L./FISHER, P.S./WOODRUFF, N.P.

1970

WIND EROSION EQUATION: COMPUTER SOLUTION AND APPLICATION.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 34(6):931-935.

A WIND EROSION EQUATION WAS PROGRAMMED FOR COMPUTER SOLUTION. THE RELATIONSHIPS AMONG VARIABLES ARE EVALUATED BY THE COMPUTER, AND THE GENERAL FUNCTIONAL RELATIONSHIP BETWEEN SOIL LOSS AND INDEPENDENT VARIABLES IS SOLVED STEPWISE TO GIVE POTENTIAL AVERAGE ANNUAL SOIL LOSS IN TONS PER ACRE PER ANNUM FOR SPECIFIED CONDITIONS OF ERODABILITY, ROUGHNESS, CLIMATE FACTOR, EQUIVALENT FIELD LENGTH, AND EQUIVALENT VEGETATIVE COVER. THE COMPUTER ALSO CAN SOLVE THE EQUATION TO DETERMINE FIELD CONDITIONS NECESSARY TO REDUCE POTENTIAL EROSION TO A TOLERABLE AMOUNT AND CAN COMPARE THE EFFECTIVENESS OF VARIOUS COMBINATIONS OF EROSION-CONTROL TREATMENTS. 4 REFERENCES.

SMITH, D.D./WHITT, D.M.

1948

EVALUATING SOIL LOSSES FROM FIELD AREAS.

AGRICULTURAL ENGINEERING 29(9):394-396, 398.

PRESENTS A REVIEW OF FACTORS USED IN THE RATIONAL EROSION EQUATION, A EQUALS CSLKP IN WHICH A IS AVERAGE ANNUAL SOIL LOSS FROM PLOTS IN TONS PER ACRE AND S,L,K,P, ARE MULTIPLIERS TO ADJUST PLOT SOIL LOSS C FOR PERCENT LAND SLOPE, LENGTH OF LAND SLOPE, SOIL GROUP, AND SUPPORTING CONSERVATION PRACTICE, RESPECTIVELY, WHEN THEIR FIELD VALUES ARE DIFFENENT FROM THEIR PLOT VALUES. THE EQUATION S PRINCIPAL USE HAS BEEN IN APPLYING EROSION CONTROL MEASURES TO LAND IN CHECKING ADEQUACY OF CONSERVATION FARMING PLANS IN CONTROLLING EROSION. 7 REFERENCES.

SMITH, D.D./WISCHMEIER, W.H.

1957

FACTORS AFFECTING SHEET AND RILL EROSION.

AMERICAN GEOPHYSICAL UNION, TRANSACTIONS 38(6):889-896.

REVIEWS TWO PRINCIPLE PROCESSES (RAINDROP IMPACT AND TRANSPORTATION OF SOIL PARTICLES BY FLOWING WATER) BY WHICH SHEET EROSION OCCURS. FACTORS AFFECTING MAGNITUDE OF LOSSES ARE LENGTH AND PERCENT SLOPE, CROPPING, SOIL, MANAGEMENT, AND RAINFALL. EFFECTIVENESS OF CONTOUR FARMING, STRIP CROPPING, AND TERRACING ARE PRESENTED. EROSION FACTORS AND CONSERVATION PRACTICES WERE COMBINED IN A RATIONAL EROSION EQUATION FOR CALCULATING FIELD SOIL LOSS FOR USE IN APPLICATION OF CONSERVATION PRACTICES AND ASSESSING LAND PROGRAM BENEFITS. 25 REFERENCES.

SMITH, D.D./WISCHMEIER, W.H.

1962

RAINFALL EROSION. IN ADVANCES IN AGRONOMY, 14:109-148.

ACADEMIC PRESS, NEW YORK.

THE TOPIC OF RAINFALL EROSION IS COVERED, INCLUDING AN HISTORICAL SKETCH OF EROSION RESEARCH AND THE TOOLS USED, THE MECHANICS OF RAINFALL EROSION, AND THE BASIC FACTORS AFFECTING FIELD SOIL LOSS, INCLUDING RAINFALL SOIL ERODIBILITY, TOPOGRAPHY, COVER AND MANAGEMENT, AND EROSION-CONTROL PRACTICES. THE FINAL SECTION SKETCHES THE HISTORICAL DEVELOPMENT OF SOIL LOSS PREDICTION AND DISCUSSES THE WISCHMEIER PREDICTION EQUATION. 165 REFERENCES.

SMITH, R.M./STAMEY, W.L.

1965

DETERMINING THE RANGE OF TOLERABLE EROSION.

SOIL SCIENCE 100(6):414-424.

REVIEW AND ANALYSIS OF VIEWPOINTS AND DATA THAT MAY HELP ESTABLISH RANGES OF TOLERABLE EROSION FOR EACH DEFINABLE CASE. THE ESSENTIAL SOIL PROPERTY ATTENDED TO IS DEPTH OF FAVORABLE SOIL MATERIAL. DISCUSSES GEOLOGIC EROSION AND ESTIMATED TOLERANCES, EROSION UNDER CLOSE-GROWING VEGETATION, WATERSHED EROSION, ROCK WEATHERING AND SOIL RENEWAL, SURFACE DEPOSITION AND SOIL RENEWAL AND TOLERANCE STANDARDS ON AGRICULTURAL LAND. CONSIDERS EROSION TOLERANCE WITHIN THE FRAMEWORK OF A MATHEMATICAL METHOD OF STANDARIDIZATION. 55 REFERENCES.

SPRINGER, D.K./BREINIG, C.B./SPRINGER, M.E.

1963

PREDICTING SOIL LOSSES IN TENNESSEE.

JOURNAL OF SOIL AND WATER CONSERVATION 18(4): 157-158.

QUANTITATIVE ESTIMATES BASED ON SCIENTIFIC DATA TO PREDICT SOIL LOSSES UNDER ALTERNATIVE SYSTEMS OF LAND USE AND MANAGEMENT ARE A VALUABLE GUIDE TO CONSERVATION FARM PLANNING. IMPROVEMENTS IN EQUATIONS FOR CALCULATING SOIL LOSS DURING THE LAST TWENTY YEARS HAVE RESULTED IN AN EQUATION, UNIVERSAL IN ADAPTABILITY, FOR USE IN AREAS WHERE RAINFALL CAUSES SIGNIFICANT SHEET EROSION. THE EQUATION IS A EQUALS RKLSCP. PREDICTED AVERAGE ANNUAL SOIL LOSS IN TONS PER ACRE, A, IS THE PRODUCT OF THE FACTOR R (RAINFALL), K (SOIL ERODIBILITY), LS (LENGTH AND STEEPNESS OF SLOPE), C (CROPPING AND MANAGEMENT), AND P (SUPPORTING CONSERVATION PRACTICE). WITH APPROPRIATE ADJUSTMENTS FOR LOCAL CONDITIONS IT IS APPLICABLE TO ALL AREAS WHERE SOIL LOSS BECAUSE OF RAIN IS SIGNIFICANT. 0 REFERENCES.

U.S. DEPARTMENT OF AGRICULTURE

1965

PROCEEDINGS OF THE FEDERAL INTER-AGENCY SEDIMENTATION CONFERENCE, 1963.

SAME AS AUTHOR, MISCELLANEOUS PUBLICATION 970. 933 P.

CONTAINS 92 PAPERS WHICH WERE PRESENTED AT THE CONFERENCE IN FOUR SYMPOSIA: 1) LAND EROSION AND CONTROL, 2) SEDIMENT IN STREAMS, 3) SEDIMENTATION IN ESTUARIES, HARBORS, AND COASTAL AREAS, AND 4) SEDIMENTATION IN RESERVOIRS. PAPER TOPICS INCLUDE THE FOLLOWING: EROSION IN AGRICULTURE, LOGGING, HIGHWAY AND URBAN CONSTRUCTION; ROLE OF STORMS, SEASONALITY, AND WATERSHED CHARACTERISTICS IN SEDIMENTATION AND EROSION, MATHEMATICAL MODELS OF SEDIMENT YIELD; SEDIMENT CONTROL METHODS IN STREAMS, COASTAL AREAS, AND RESERVOIRS; AND RESULTS OF SURVEYS AND STUDIES PERTAINING TO SEDIMENTATION. REFERENCES FOLLOW EACH PAPER.

VAN DOREN, C.A./BARTELLI, L.J.

1956

A METHOD OF FORECASTING SOIL LOSS.

AGRICULTURAL ENGINEERING 37(5):335-341.

COMPOSITE TABLES DEVELOPED AT THE DIXON SPRINGS EXPERIMENT STATION IN ILLINOIS AND PRESENTED HERE SERVE AS GUIDES FOR DEVELOPING SOIL AND WATER CONSERVATION PROGRAMS. EACH OF THE KNOWN FACTORS RELATIVE TO EROSION OR SOIL LOSS HAS BEEN ASSIGNED AN EROSION-INFLUENCE VALUE TO FIT INTO A DIRECT-RELATION FORMULA FOR FAST CALCULATION. FACTORS AFFECTING EROSION INCLUDE: (1) SLOPE FACTORS, (2) CROP AND ROTATION FACTORS, (3) CONSERVATION PRACTICES, (4) SOIL FACTORS, (5) SOIL-LOSS FACTORS. 16 REFERENCES.

WALLIS, J.R.

1963

LOGGING FOR WATER QUALITY IN NORTHERN CALIFORNIA.

U.S. FOREST SERVICE, PACIFIC SOUTHWEST FOREST AND RANGE EXPERIMENT STATION, BERKELEY, CALIFORNIA, RESEARCH NOTE PSW-23. 6 P.

LAND MANAGERS HAVE DEVELOPED MANY IMPORTANT RULES FOR LOGGING WHILE PRESERVING QUALITY, INCLUDING SUCH RULES AS AVOIDING CREEKBEDS AND WASHES WHEN PLANNING ROADS; INSTALLING CROSS-DRAINAGE ON ALL TEMPORARY LOGGING ROADS; COMPACTING BIG FILLS DURING ROAD CONSTRUCTION, ETC. HOWEVER, MANY OTHER VARIABLES BESIDES LOGGING METHODS AND PROCEDURES INFLUENCE THE AMOUNT OF SEDIMENT PRODUCED BY A WATERSHED, SUCH AS METEROLOGY, TERRAIN, VEGETATION, SUSCEPTIBILITY OF SOIL TO GULLYING AND SHEET EROSION, AND SLOPE STABILITY. AN EQUATION BASED ON THESE FACTORS IS PRESENTED, AND RESEARCH HAS SHOWN THAT BY SOLVING STATISTICAL EQUATIONS OF THIS KIND, THE RELATIVE AMOUNTS OF SEDIMENT ATTRIBUTABLE TO EACH CAUSE CAN BE ESTIMATED. SOIL-VEGETATION SURVEY MAPS CAN BE USEFUL IN DETERMINING EROSION POTENTIAL FOR SPECIFIC AREAS. FOUR REFERENCES.

WALLIS, J.R.

1965

A FACTOR ANALYSIS OF SOIL EROSION AND STREAM SEDIMENTATION IN NORTHERN CALIFORNIA.

UNIVERSITY OF CALIFORNIA, BERKELEY (PH.D. DISSERTATION). 142 P.

THE PRESENT PRODUCTION OF STREAM SUSPENDED SEDIMENT AND EROSION OF THE SOIL MANTLE IS HIGH FOR MANY MOUNTAINOUS NORTHERN CALIFORNIA WATERSHEDS. IN THIS STUDY SEDIMENT LOADS WERE RELATED TO AMOUNT OF RUNOFF, PRECIPITATION INTENSITY, WATERSHED GEOMETRY, SOIL ERODIBILITY, SEDIMENT PRODUCING LOGGING PRACTICES, AREAS OF WILDFIRE, AND GRASSLANDS IN POOR CONDITION, BY PRINCIPAL COMPONENT ANALYSIS WITH VARIMAX ROTATION OF THE FACTOR WEIGHT MATRIX.

WISCHMEIER, W.H./SMITH, D.D.

1958

RAINFALL ENERGY AND ITS RELATIONSHIP TO SOIL LOSS.

AMERICAN GEOPHYSICAL UNION, TRANSACTIONS 39(2):285-291.

A PROCEDURE IS PRESENTED FOR COMPUTATION OF KINETIC ENERGY OF A RAINSTORM FROM INFORMATION ON A RECORDING-RAIN GAGE CHART. AN EQUATION IS DEVELOPED DESCRIBING RAINFALL ENERGY AS A FUNCTION OF RAINFALL INTENSITY. THE EFFORTS OF RAINFALL ENERGY AND ITS INTERACTION WITH OTHER VARIABLES ARE EVALUATED IN MULTIPLE REGRESSION ANALYSES BASED ON DATA REPRESENTING 4 SOIL TYPES. APPLICATION OF THIS INFORMATION TO SEPARATE THE EFFECTS OF RAINFALL FROM THOSE OF PHYSICAL AND MANAGEMENT CHARACTERISTICS IN PLOT DATA IS DISCUSSED BRIEFLY.

WISCHMEIER, W.H.

1959

A RAINFALL EROSION INDEX FOR A UNIVERSAL SOIL-LOSS EQUATION.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 23(3):246-249.

EXTENSIVE REGRESSION ANALYSES OF BASIC SOIL-LOSS DATA WERE DESIGNED TO DETERMINE THE BEST INDICATOR OF THE CAPACITY OF A STORM TO ERODE SOIL. THE RAINSTORM CHARACTERISTIC FOUND TO BE OUTSTANDING AS SUCH AN INDICATOR IS THE VARIABLE WHOSE VALUE IS THE PRODUCT OF THE RAINFALL ENERGY AND MAXIMUM 30-MINUTE INTENSITY OF THE STORM (DESIGNATED AS EI). THIS VARIABLE EXPLAINED FROM 72 TO 97 PERCENT OF THE VARIATION IN INDIVIDUAL-STORM EROSION FROM TILLED CONTINUOUS FALLOW ON SIX SOILS. SEASONAL RAINFALL EROSION INDEX VALUES COMPUTED BY ADDING THE EI VALUES OF STORMS GREATER THAN 0.5 INCH EXPLAINED AS HIGH AS 94 PERCENT OF THE YEARLY DEVIATION IN TOTAL SOIL LOSS FROM FALLOW DURING THE SUMMER SEASON. TESTED AGAINST DATA FROM PLOTS IN CONTINUOUS ROW CROP FOR 10 OR MORE YEARS AT EACH OF FOUR WIDELY SEPARATED LOCATIONS, THE SUMMED EI VALUES EXPLAINED FROM 72 TO 85 PERCENT OF THE YEARLY VARIATION IN SOIL LOSS WITHIN CORRESPONDING COVER PERIODS. ABOUT 8,000 PLOT-YEARS OF BASIC EROSION DATA ARE BEING ANALYZED TO EVALUATE FACTORS FOR A UNIVERSAL SOIL-LOSS EQUATION FOR WHICH THE EROSION POTENTIAL OF EXPECTED LOCAL RAINFALL SERVES AS THE BASE. TESTS SHOW THAT ESTIMATES OF AVERAGE EROSION LOSSES COMPUTED IN THIS MANNER ARE SUFFICIENTLY ACCURATE TO SERVE AS SOUND BASES FOR CONSERVATION FARM PLANNING. TEN REFERENCES.

WISCHMEIER, W.H.

1960

CROPPING-MANAGEMENT FACTOR EVALUATIONS FOR A UNIVERSAL SOIL-LOSS EQUATION.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 24(4):322-326.

ABOUT 8,000 PLOT-YEARS OF SOIL LOSS AND RELATED DATA FROM 21 STATES WERE ANALYZED TO EVALUATE INFLUENCES OF VEGETAL GROWTH, CROP SEQUENCE, TILLAGE PRACTICES, FERTILITY, AND RESIDUE MANAGEMENT ON EROSION OF SOIL BY RAINFALL. SPECIFIC CROP DATA WERE GROUPED IN HOMOGENOUS INTERVALS AND MEASURED SOIL LOSSES OF EACH PERIOD WERE COMPARED WITH CORRESPONDING LOSSES FROM BARE FALLOW. CANOPY PROTECTION AND THE RESIDUAL EFFECTS OF PRIOR CROPPING AND MANAGEMENT DIFFERED SIGNIFICANTLY FOR EACH PERIOD. SOIL LOSSES FOR EACH CROP STAGE PERIOD ARE PRESENTED IN TABULAR FORM AS PERCENTAGES OF LOSSES FROM FALLOW UNDER IDENTICAL RAINFALL. THE TABLE IS DESIGNED FOR USE WITH RAINFALL EROSION INDEX MAPS AND MONTHLY DISTRIBUTION CURVES COMPUTED FROM LOCAL RAINFALL RECORDS TO PROVIDE A GUIDE FOR CONSERVATION FARM PLANNING ADAPTED TO THE LOCAL RAINFALL PATTERN. 11 REFERENCES.

WISCHMEIER, W.H.

1966

RELATION OF FIELD-PLOT RUNOFF TO MANAGEMENT AND PHYSICAL FACTORS.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 30(2):272-277.

THE DETAILED DATA FOR RUNOFF ANALYSIS WERE ASSEMBLED FROM NEARLY ALL EROSION PLOT STUDIES IN THE UNITED STATES. INDIVIDUAL STUDY AVERAGES OF RUNOFF FROM CROPPED PLOTS HAVE RANGED FROM 3 TO 36 PERCENT OF TOTAL PRECIPITATION. ANALYSES INDICATED FACTORS VALUABLE FOR PREDICTING WATER YIELD FROM CROPLAND AREAS. IMPROVED SOIL AND CROP MANAGEMENT REDUCED AVERAGE PLOT RUNOFF ABOUT 40 PERCENT. AT MODERATE FERTILITY LEVEL, RUNOFF REDUCTION BY CONTOUR TILLAGE AVERAGED SLIGHTLY MORE THAN 15 PERCENT. UNDER NATURAL CONDITIONS, RUNOFF FROM ROW CROPS AVERAGED A TEN PERCENT INCREASE FOR EACH ADDITIONAL PERCENT SLOPE. THE MATHEMATICAL RELATIONSHIP IS GIVEN. 22 REFERENCES.

WISCHMEIER, W.H./SMITH, D.D./UHLAND, R.E.

1958

EVALUATION OF FACTORS IN THE SOIL-LOSS EQUATION.

AGRICULTURAL ENGINEERING 39(8):458-462.

LENGTH OF SLOPE FACTOR AND DEGREE OF SLOPE FACTOR, WHICH COMPRISE PART OF THE SOIL-LOSS ESTIMATING EQUATION, ARE REEVALUATED AS A RESULT OF NEW INFORMATION. FIGURES ARE PRESENTED FOR ADJUSTING SOIL-LOSS DATA FOR DIFFERENCES IN LENGTH AND DEGREE OF SLOPE. A SINGLE-STORM, TWO EQUATION APPROACH TO SOIL LOSS PREDICTION IS PRESENTED AS A MEANS OF MINIMIZING BIAS IN SOIL LOSS DATA DUE TO SIGNIFICANT DIFFERENCES IN THE CHARACTERISTICS OF INDIVIDUAL RAINS. SOIL ERODIBILITY AND RAINFALL FACTORS MAY BE EVALUATED INDEPENDENTLY BY EMPLOYMENT OF THE NEW RELATIONSHIPS PROVIDED TO SEGREGATE SOIL AND RAINFALL EFFECTS. 15 REFERENCES.

WISCHMEIER, W.H./SMITH, D.D.

1965

PREDICTING RAINFALL-EROSION LOSSES FROM CROPLAND EAST OF THE ROCKY MOUNTAINS; GUIDE FOR SELECTION OF PRACTICES FOR SOIL AND WATER CONSERVATION.

U.S. DEPARTMENT OF AGRICULTURE, HANDBOOK 282. 47 P.

THE SOIL-LOSS PREDICTION PROCEDURE PRESENTED IN THIS HANDBOOK PROVIDES A METHODICAL MEANS FOR USING AVAILABLE RESEARCH INFORMATION TO HELP GUIDE LAND USE AND MANAGEMENT DECISIONS ON ANY PARTICULAR FARM FIELD WHERE SOIL EROSION BY RAINFALL AND RUNOFF IS A PROBLEM. THE SOIL-LOSS PREDICTION EQUATION PRESENTED IS UNIVERSALLY APPLICABLE WHEREVER LOCATIONAL VALUES OF THE EQUATION S INDIVIDUAL FACTORS ARE KNOWN OR CAN BE DETERMINED. RESEARCH DATA ASSEMBLED FROM ALL MAJOR AGRICULTURAL AREAS OF THE UNITED STATES WERE ANALYZED AND SUMMARIZED IN READY-REFERENCE TABLES AND GRAPHS, THUS PROVIDING A SOURCE FOR APPROXIMATING THE FACTOR VALUES NEEDED TO APPLY THE EQUATION. 28 REFERENCES.

WISCHMEIER, W.H./JOHNSON, C.B./CROSS, B.V.

1971

SOIL ERODIBILITY NOMOGRAPH FOR FARMLAND AND CONSTRUCTION SITES.

JOURNAL OF SOIL AND WATER CONSERVATION 26(5):189-193.

A NEW SOIL PARTICLE-SIZE PARAMETER WAS FOUND AND USED TO DERIVE A CONVENIENT ERODIBILITY EQUATION VALID FOR EXPOSED SUBSOILS AS WELL AS FARMLAND. A SIMPLE NOMOGRAPH PROVIDES A QUICK SOLUTION TO THE EQUATION WITH ONLY FIVE SOIL PARAMETERS NECESSARY: PERCENT SILT, PERCENT SAND, ORGANIC MATTER CONTENT, STRUCTURE, AND PERMEABILITY. THIS TECHNIQUE IS VALUABLE FOR AGRICULTURAL SOILS AND FOR PLANNING SEDIMENT CONTROL MEASURES FOR CONSTRUCTION SITES AND OTHER DISTURBED AREAS. SEVEN REFERENCES.

WISCHMEIER, W.H./MEYER, L.D.

1973

SOIL ERODIBILITY ON CONSTRUCTION AREAS. IN SOIL EROSION: CAUSES AND MECHANISMS, PREVENTION AND CONTROL, P. 20-29.

NATIONAL RESEARCH COUNCIL, HIGHWAY RESEARCH BOARD, SPECIAL REPORT 135.

THE MAJOR FACTORS IN SOIL EROSION AND THEIR FUNCTIONAL RELATIONSHIPS TO SOIL LOSS WERE COMBINED IN AN EMPIRICAL EROSION EQUATION ADAPTABLE TO SEDIMENT PREDICTION AND EROSION CONTROL PLANNING ON CONSTRUCTION AREAS. SOIL ERODIBILITY IS ONE OF SIX MAJOR FACTORS AS WELL AS RAINFALL PATTERN, SLOPE STEEPNESS AND SHAPE, COVER AND MANAGEMENT, AND CONSERVATION PRACTICES. THEY ARE INTERPRETED RELATIVE TO CONSTRUCTION-SITE CONDITIONS, AND SOURCES OF INFORMATION FOR THEIR LOCALITY EVALUATION ARE DISCUSSED. RESULTS OF AN INTENSIVE FIELD, LABORATORY, AND STATISTICAL STUDY OF THE RELATIONS OF SOIL PROPERTIES AND INTERACTIONS TO A SOIL S ERODIBILITY ARE SUMMARIZED. 20 REFERENCES.

WOLMAN, M.G.

1963

EROSION AND SEDIMENTATION.

AMERICAN GEOPHYSICAL UNION, TRANSACTIONS 44(2):554-561.

REPORTS ON LABORATORY STUDIES OF PRINCIPLES OF EROSION AND TRANSPORTATION OF SEDIMENTS, EROSIONAL PROCESSES ON HILL SLOPES AND IN CHANNELS, EROSION ON AGRICULTURAL AND URBAN AREAS, AND LABORATORY AND FIELD DEVICES IN SEDIMENTATION. INCLUDED REPORTS ON DESCRIPTIVE EQUATIONS OF SOIL LOSS AND TOPOGRAPHIC CONFIGURATION, AND VARIOUS EXPERIMENTS ON SCOUR RESISTANCE AND SOIL TYPES. 34 REFERENCES.

WOOLRIDGE, D.D.

1965

SOIL PROPERTIES RELATED TO EROSION OF WILD-LAND SOILS IN CENTRAL WASHINGTON. IN C.T. YOUNGBERG, ED., FOREST-SOIL RELATIONSHIPS IN NORTH AMERICA, P. 141-152.

OREGON STATE UNIVERSITY PRESS, CORVALLIS. 532 P.

A TWO-PHASE INVESTIGATION OF THE RELATIONSHIP OF SOIL PROPERTIES TO AN INDEX OF SOIL EROSION, MEAN AGGREGATE SIZE, IS DESCRIBED. PHASE ONE REVIEWS DETAILS OF TECHNIQUES OF WET SIEVING AND DETERMINING MEAN AGGREGATE SIZE, AND THE SECOND PHASE DESCRIBES THE USE OF MEAN AGGREGATE SIZE AS AN INDEX OF EROSION AND DISCUSSES SOIL PROPERTIES RELATED TO SOIL EROSION HAZARD. SOIL PROPERTIES ASSOCIATED WITH SITE DETERIORATION WERE STUDIED OVER A 50 FOOT TRANSECT EXTENDING FROM A 175-YEAR-OLD FOREST STAND TO AN OPEN SEMIDENUDED MEADOW ON A BASALT SOIL PARENT MATERIAL IN WASHINGTON. THE REGRESSION EQUATIONS SUBSEQUENTLY DEVELOPED ARE NOT INTENDED FOR USE AS PREDICTION EQUATIONS BUT RATHER AS A BASIS FOR UNDERSTANDING RELATIONSHIPS OF SOIL PROPERTIES TO EROSION HAZARD. 25 REFERENCES.

YOUNG, R.A./BURWELL, R.E.

1972

PREDICTION OF RUNOFF AND EROSION FROM NATURAL RAINFALL USING A RAINFALL SIMULATOR.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 36(5):827-830.

A COMPARISON WAS MADE OF THE SOIL AND WATER LOSSES FROM THREE NATURAL STORMS AND THREE SIMULATED STORMS ON CULTIVATED FALLOW PLOTS UNDER SIMILAR RAINFALL AND SOIL CONDITIONS. A RAINULATOR WAS USED TO APPLY THE SIMULATED STORMS. SOIL LOSSES FROM THE THREE SIMULATED STORMS AVERAGED 77 PERCENT OF THOSE FROM THE NATURAL RAINSTORMS. THIS COMPARES CLOSELY, CONSIDERING THE EI VALUE FOR THE SIMULATED STORMS WAS 78 PERCENT OF THAT FOR NATURAL RAINSTORMS. THE RUNOFF FROM THE SIMULATED STORMS COMPARED QUITE CLOSELY TO RUNOFF FROM THE NATURAL STORMS. 6 REFERENCES.

MECHANICAL OR CONSERVATION PRACTICES FOR EROSION CONTROL

ADAMS, J.E.

1966

INFLUENCE OF MULCHES ON RUNOFF, EROSION, AND SOIL MOISTURE DEPLETION.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 30(1):110-114.

A 3-YEAR STUDY WAS CONDUCTED ON AUSTIN CLAY AT TEMPLE, TEXAS, TO DETERMINE THE EFFECT OF MULCHES ON STRAW, GRAVEL, AND SOIL TREATED WITH DIOCTADECYL DIMETHYL AMMONIUM CHLORIDE (DDAC) ON RUNOFF, EROSION, AND EVAPORATION. MULCHES WERE APPLIED TO 0.01 ACRE PLOTS ON A 4 PERCENT SLOPE. PLOTS WERE FALLOWED 2 YEARS AND PLANTED IN GRAIN SORGHAM THE THIRD YEAR. RUNOFF AND EROSION WERE GREATER FROM DDAC-TREATED SOIL THAN FROM BARE-CHECK SOIL. A SURFACE COVER OF STRAW OR GRAVEL REDUCED RUNOFF SIGNIFICANTLY AND ESSENTIALLY ELIMINATED EROSION. STRAW, GRAVEL, AND DDAC-TREATED SOIL MULCHES WERE ABOUT EQUALLY EFFECTIVE IN EVAPORATION CONTROL OVER PERIODS OF A MONTH OR MORE. DURING HIGH RAINFALL PERIODS, STRAW AND GRAVEL MULCHES INCREASED INFILTRATION AND MOVEMENT OF EXCESS WATER BELOW 54 INCHES. THE EFFECT OF CHEMICAL TREATMENTS ON RUNOFF AND EROSION SHOULD BE CONSIDERED IN ADDITION TO THEIR ABILITY TO REDUCE EVAPORATION OF SOIL MOISTURE. 18 REFERENCES.

BARNES, R.C., JR.

1973

EROSION CONTROL STRUCTURES. IN SOIL EROSION: CAUSES AND MECHANISMS, PREVENTION AND CONTROL, P. 94-98.

NATIONAL RESEARCH COUNCIL, HIGHWAY RESEARCH BOARD, SPECIAL REPORT 135.

EROSION AND EXCESS RUNOFF ARE PRODUCTS OF MANY FACTORS: SOIL TYPE, PLANT COVER, CROPPING PRACTICES, CLIMATIC ZONES, RAINFALL AMOUNTS AND INTENSITIES, AND DEGREE AND LENGTH OF SLOPE, TO NAME A FEW. WATER EROSION USUALLY OCCURS AS SHEET EROSION, THE PERIODIC REMOVAL OF THIN SHEETS OF SOIL OVER AN AREA, OR AS GULLY EROSION THAT FORMS INCISED CHANNELS. THE END PRODUCT IS SEDIMENT. IN THE CONSTRUCTION STAGE NATURAL CONDITIONS SUCH AS TOPOGRAPHY, NATURAL COVER, SOIL CONDITIONS, AND DRAINAGE PATTERNS ARE DISRUPTED BY MAN AND MACHINES. IT SHOULD BE THE GOAL OF EACH DESIGN AND CONSTRUCTION ENGINEER TO CONTROL THESE RESULTS WITHIN REASONABLE LIMITS DURING THE CONSTRUCTION STAGE AND FINALLY TO PERMANENTLY STABILIZE THE AREA FOR CONTROL OF EROSION AND RUNOFF UPON COMPLETION OF THE JOB. METHODS TO CONTROL RUNOFF AND EROSION THAT ARE USEFUL FOR HIGHWAY CONSTRUCTION ARE REVIEWED. ONE REFERENCE.

BEAUMONT, P./ATKINSON, K.

1969

SOIL EROSION AND CONSERVATION IN NORTHERN JORDAN.

JOURNAL OF SOIL AND WATER CONSERVATION 24(4):144-147.

ENVIRONMENTAL DIFFICULTIES, PARTICULARLY MARGINAL RAINFALL IN TERMS OF AGRICULTURAL PRODUCTION, AND POOR LAND USE PRACTICES HAVE CAUSED SERIOUS EROSION PROBLEMS IN JORDAN. THE WADI ZIQLAB WAS CHOSEN AS AN EXPERIMENTAL STUDY AREA WHERE THE AIM WAS TO REDUCE THE RATE OF SOIL REMOVAL BY INTRODUCING PHYSICAL BARRIERS TO DOWNSLOPE SOIL MOVEMENT. CONTOUR WALLS, GRADONI TERRACES, AND GULLY PLUGS WERE CONSTRUCTED IN SELECTED AREAS. FROM 1965-1968, MORE THAN 750 GULLY PLUGS AND MORE THAN 440 KILMETERS OF CONTOUR WALLING WAS CONSTRUCTED IN THE UPPER REACHES OF THE WATERSHED WHICH MEASURES 106 SQUARE KILOMETERS IN AREA. FUTURE PLANS INCLUDE EXTENDING SIMILAR PROGRAMS TO NEIGHBORING WATERSHEDS. 0 REFERENCES.

BENNETT, H.H./BELL, F.G./ROBINSON, B.D.

1951

RAINDROPS AND EROSION.

U.S. DEPARTMENT OF AGRICULTURE, CIRCULAR 895, 23 P.

SHOWS THE RELATION OF RAINDROPS TO THE EROSION PROCESS. DISCUSSES THE NATURE OF EROSION, TYPES OF EROSION, EFFECTS OF RAIN SPLASH, THE NATURE OF RAINFALL, CHARACTERISTICS OF RAINDROPS, CHANGES IN SOIL POROSITY WITH WETTING, AND RUNOFF. PROTECTIVE MEASURES ARE SUGGESTED, SUCH AS CLOSE-GROWING COVER CROPS, STUBBLE MULCHING, AND SURFACE APPLICATION OF MANURE, SAWDUST, WOODCHIPS, OR ROTTEN HAY. CONTOURED RIDGES AND TERRACES ARE TILLAGE METHODS THAT HELP REDUCE EROSION. 19 REFERENCES.

BERNAL, A.O.

1972

IMPLICATIONS OF EROSION CONTROL PRACTICES ON SOIL MOISTURE AND PRODUCTIVITY OF WESTERN IOWA SOILS.

IOWA STATE UNIVERSITY (PH.D. DISSERTATION). 381 P.

ONE OF THE OBJECTIVES OF THIS STUDY WAS TO DEVELOP INFORMATION THAT CAN SERVE AS A GUIDE FOR SOIL AND WATER CONSERVATION FARMING IN THE MONONA-IDA SOIL ASSOCIATION OF WESTERN IOWA. IN MOST YEARS RAINFALL IS ADEQUATE FOR THE PRODUCTION OF CROPS BUT THE ERRATIC DISTRIBUTION, WITH TORRENTIAL RAINS FOLLOWED BY LONG DRY PERIODS, MAKES IT DESIRABLE TO CONSERVE A MAXIMUM AMOUNT OF WATER FOR CROP USE. DATA WERE COLLECTED IN TWO AREAS OF WESTERN IOWA FOR SIX LAND TREATMENT PRACTICES (SUMMER FALLOW, PERMANENT COVER, CONTOURING, RIDGE FARMING, TERRACING, AND EXPOSED SUBSOIL). DATA WERE ANALYZED BY A TECHNIQUE PROVIDING A MEANS OF EVALUATING SIMULTANEOUSLY THE EFFECTS OF MANY INDEPENDENT VARIABLES (INPUT HYPOTHESIZED TO AFFECT CORN YIELD). RESULTS INDICATE THAT YIELD ON ANY OF THE DISCUSSED PRACTICES SHOULD BE ABOUT EQUAL IN THE LONG RUN BECAUSE OF THE UNIFORMITY OF THE SOILS AND THE LEVEL OF TECHNOLOGY USED IN THE AREA.

BLAKELY, B.D./COYLE, J.J./STEELE, J.G.

1957

EROSION ON CULTIVATED LAND.

U.S. DEPARTMENT OF AGRICULTURE YEARBOOK 1957:290-307.

REVIEWS FACTORS AFFECTING EROSION, INCLUDING 1) AMOUNT AND SPEED OF RUNOFF, 2) KIND AND AMOUNT OF COVER, 3) KIND OF SOIL, AND 4) STEEPNESS AND LENGTH OF SLOPE. CONSERVATION TECHNIQUES FOR CULTIVATED SLOPING SOIL EXPOSED TO EROSIVE RAINS INCLUDE WATERWAYS, CONTOUR TILLAGE, STRIPCROPPING, TERRACING, AND DIVERSION TERRACES. TABLES ARE PRESENTED AS GUIDES TO HELP FARMERS SELECT CCOMBINATIONS OF ROTATIONS AND PRACTICES THAT REDUCE SOIL LOSSES TO WITHIN ALLOWABLE LIMITS. MAP INCLUDED. 0 REFERENCES.

BORST, H.L./MCCALL, A.G./BELL, F.G.

1945

INVESTIGATIONS IN EROSION CONTROL AND RECLAMATION OF ERODED LAND AT THE NORTHWEST APPALACHIAN CONSERVATION EXPERIMENT STATION, ZANESVILLE, OHIO, 1934-1942.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 888, 95 P.

TOPOGRAPHY IN THIS AREA IS HILLY AND SOILS ARE ACIDIC. OLD STYLE FARMING ON SLOPES CAUSES SERIOUS EROSION. GRASSES AND LEGUMES SHOULD REPLACE ALL OTHER CROPS, AS THEY PROVIDE MAXIMUM RESISTANCE TO EROSION. STRIP CROPPING AND TERRACING REDUCE EROSION. RAINFALL SIMULATION STUDIES WERE DONE TO DETERMINE TYPES OF MULCHING EFFECTIVE FOR EROSION CONTROL. STRAW MULCH PLACED ON AN OPEN SURFACE PROMOTED RAPID INFILTRATION AND CONTROLLED EROSION. SEEDINGS AND PLANTINGS EFFECTIVE FOR EROSION CONTROL ARE DISCUSSED. 35 REFERENCES.

BROWN, R.J./MICKEY, J., JR.

1975

STABILIZATION OF EROSION ON A MOUNTAINOUS ROAD CONSTRUCTION PROJECT. IN SYMPOSIUM ON TROUT RESEARCH AND MANAGEMENT, PROCEEDINGS, PP. 87-92.

U.S. FOREST SERVICE, SOUTHEASTERN FOREST EXPERIMENT STATION, ASHEVILLE, N.C. 110 P.

THE SUCCESSFUL CONTROL OF EROSION FROM A MOUNTAINOUS ROAD CONSTRUCTION PROJECT IN WESTERN NORTH CAROLINA RESULTED IN THE PRESERVATION OF TROUT HABITAT. METHODS OF EROSION CONTROL, SUCH AS ROAD SHOULDER MAINTENANCE, PLASTIC DOWN DRAINS, SILT BASIN, BRUSH BARRIER, TEMPORARY SILT FENCE, BRUSH CHECK DAM, LOG CHECK DAM, SEEDING AND FERTILIZATION, TOP DRESSING, MULCHING, AND JUTE MATS ARE EVALUATED. 2 REFERENCES.

BROWNING, G.M./PARISH, C.L./GLASS, J.

1947

A METHOD FOR DETERMINING THE USE AND LIMITATIONS OF ROTATION AND CONSERVATION PRACTICES IN THE CONTROL OF SOIL EROSION IN IOWA.

AMERICAN SOCIETY OF AGRONOMY JOURNAL 39(1): 65-73.

REVIEWS RESEARCH DONE AT SOIL CONSERVATION EXPERIMENTAL FARMS THROUGHOUT THE UNITED STATES REGARDING FACTORS AFFECTING EROSION: TYPE AND AMOUNT OF VEGETATION, LENGTH AND STEEPNESS OF SLOPE, AMOUNT, INTENSITY AND DISTRIBUTION OF RAINFALL, AND SOIL TYPE. IN ADDITION, AFFECTS OF CONSERVATION PRACTICES (CONTOURING, TERRACING, STRIP CROPPING) ON EROSION AND RUNOFF ARE REVIEWED. USING DATA GATHERED ON WISCONSIN, MISSOURI, AND IOWA FARMS, A GUIDE HAS BEEN DEVELOPED FOR ALL SOIL MAPPED IN IOWA, SHOWING USE AND LIMITATIONS OF ROTATION AND CONSERVATION PRACTICES IN THE CONTROL OF EROSION. 7 REFERENCES.

BROWNING, G.M. ET AL

1948

INVESTIGATIONS IN EROSION CONTROL AND THE RECLAMATION OF ERODED LAND AT THE MISSOURI VALLEY LOESS CONSERVATION EXPERIMENT STATION, CLARINDA, IOWA, 1931-1942.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 959, 88 P.

THESE INVESTIGATIONS WERE DESIGNED TO DETERMINE THE FACTORS AFFECTING RUNOFF AND EROSION AND TO DEVELOP METHODS OF EROSION CONTROL. FOUR PRIMARY FACTORS INFLUENCE EROSION: 1) RAINFALL AMOUNT, INTENSITY, AND DISTRIBUTION; 2) SLOPE LENGTH AND DEGREE; 3) VEGETATION TYPE AND AMOUNT; AND 4) SOIL. THE EFFECT OF VARIATIONS IN CROPPING SYSTEMS ON EROSION IS DISCUSSED. STRIP CROPPING AND TERRACING ARE PARTICULARLY EFFECTIVE AGAINST SOIL EROSION. GRASSES PROVIDE THE BEST COVER FOR EROSION RESISTANCE. 46 REFERENCES.

CHEPIL, W.S. ET AL

1963

VEGETATIVE AND NONVEGETATIVE MATERIALS TO CONTROL WIND AND WATER EROSION.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 27(1):86-89.

FINE, MEDIUM, AND COARSE GRAVEL SPREAD AT RATES OF 20, 50, AND 100 TONS PER ACRE, RESPECTIVELY, ADEQUATELY CONTROLLED WIND EROSION OF SMOOTH, BARE, SARPY SANDY LOAM WHERE NO TRAFFIC WAS INVOLVED. ON A 3:1 CONSTRUCTION SLOPE, AT LEAST 1,200 GALLONS OF ASPHALT EMULSION PER ACRE SPRAYED UNIFORMLY ON THE SURFACE WERE MEEDED TO CONTROL RILL EROSION. THE TREATMENT COST 335 DOLLARS PER ACRE. IN PREVIOUS EXPERIMENTS ON A 3:1 CONSTRUCTION SLOPE, PRAIRIE HAY MULCH AT 4000 POUNDS PER ACRE UNIFORMLY SPREAD AND ANCHORED WITH 400 GALLONS OF ASPHALT EMULSION PER ACRE WAS EQUALLY EFFECTIVE AT A COST OF ABOUT 200 DOLLARS PER ACRE. 0 REFERENCES.

COOK, R.L./ERICKSON, A.E.

1964

MINIMUM TILLAGE AS AN EROSION CONTROL PRACTICE.

INTERNATIONAL CONGRESS OF SOIL SCIENCE, 8TH, BUCHAREST, ROMANIA, 1964, VOLUME 2, P. 699-703.

TWO FULLY INSTRUMENTED WATERSHEDS ON SPINKS SANDY LOAM IN MICHIGAN HAVE GROWN CORN SINCE 1959. ONE AREA RECEIVED CONVENTIONAL TILLAGE AFTER MOLDBOARD PLOWING AND BEFORE PLANTING; THE OTHER WAS PLANTED IN TRACTOR WHEEL MARKS WITHOUT THE CONVENTIONAL TILLAGE. TREATMENTS WERE REVERSED ON THE TWO AREAS IN 1962. TOTAL RUNOFF FROM SEVEN STORMS DURING A PERIOD OF FOUR YEARS WAS MUCH GREATER FROM LAND THAT HAD BEEN TILLED AFTER PLOWING THAN FROM MINIMUM TILLED LAND. THE SAME WAS TRUE OF SOIL LOSS. INTENSITY OF RAINFALL WAS IMPORTANT SO FAR AS AMOUNT OF SOIL LOSS WAS CONCERNED, AND AUGUST RUNOFF WAS LESS EROSIVE THAN THAT WHICH OCCURRED IN JUNE. 4 REFERENCES.

COPLEY, T.A. ET AL

1944

INVESTIGATIONS IN EROSION CONTROL AND RECLAMATION OF ERODED LAND AT THE CENTRAL PIEDMONT CONSERVATION EXPERIMENT STATION, STATESVILLE, N.C., 1930-1940.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 873, 66 P.

INVESTIGATIONS INTO THE CAUSES AND CONSEQUENCES OF EROSION AND METHODS FOR ITS CONTROL WERE CONDUCTED ON PLOTS OF VARIOUS SIZES, FIELDS, AND TERRACED AND NATURAL WATERSHEDS. METEOROLOGICAL RECORDS WERE ALSO KEPT. THE CONTROL PLOT STUDIES SHOWED THAT RUNOFF AND SOIL LOSSES WERE DIRECTLY RELATED TO RAINFALL INTENSITY, BUT THE MAGNITUDE OF SOIL LOSS WAS MODIFIED BY SUCH OTHER FACTORS AS SOIL TYPE, SOIL MOISTURE, STATE OF CULTIVATION, DEGREE AND LENGTH OF SLOPE, AND EXTENT OF PROTECTIVE COVER ON THE SLOPE. RUNOFF AND SOIL LOSSES UNDER GOOD VEGETAL COVER COMPOSED OF SOD OR WOODS WERE OF NEGLIGIBLE QUANTITIES. BURNING OF WOODS LITTER INCREASED RUNOFF AND SOIL LOSSES TO SERIOUSLY LARGE QUANTITIES. METHODS AND TYPES OF TERRACING ARE PRESENTED. 7 REFERENCES.

CURTIS, W.R.

1971

TERRACES REDUCE RUNOFF AND EROSION ON SURFACE-MINE BENCHES.

JOURNAL OF SOIL AND WATER CONSERVATION 26(5):198-199.

A TWO-YEAR STUDY IN BREATHITT COUNTY, KENTUCKY, INDICATED THAT TERRACES CAN EFFECTIVELY CONTROL RUNOFF AND EROSION ON SURFACE-MINE BENCHES. IN AN AREA WHERE THE SPOIL WAS PREDOMINATELY SHALE, PEAK FLOWS ON A TERRACED PLOT AVERAGED 65 PERCENT LESS THAN ON THE CONTROL PLOT, SEDIMENT YIELD AVERAGED 52 PERCENT LESS, AND TOTAL RUNOFF AVERAGED 42 PERCENT LESS. COMPARABLE FIGURES ON A SET OF PLOTS HAVING SUBSTANTIAL AMOUNTS OF SANDSTONE WERE 65, 70, AND 6 PERCENT, RESPECTIVELY. AVERAGE STORM RUNOFF DURATION WAS 1 PERCENT HIGHER ON THE TERRACED PLOT OF EACH PAIR. 1 REFERENCE.

CUSKELLY, S.L.

1969

EROSION-CONTROL PROBLEMS AND PRACTICES ON NATIONAL FOREST LANDS.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 12(1):69-70, 85.

A HYDROLOGIC ANALYSIS SYSTEM WAS DEVELOPED AT THE INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION BASED ON THE STRATIFICATION OF THE LANDSCAPE COMPLEX INTO HOMOGENEOUS AREAS. THIS SYSTEM IS DESIGNED TO GATHER INFORMATION AND PROVIDE UNDERSTANDING OF VARIOUS LANDSCAPES, FACILITATE MANAGEMENT INTERPRETATIONS AND IMPROVE THE QUALITY OF THE DECISION-MAKING PROCESS. WHEN RANGE MANAGEMENT IS IMPROVED, VEGETATION WILL RESEED ITSELF AND THE RANGE IS IMPROVED. SOME SOIL CONSERVATION PRACTICES DISCUSSED INCLUDE: CONTOUR TRENCHING, CONTOUR FURROWING, GULLY PLUGS, AND STREAMBACK STABILIZATION. 0 REFERENCES.

DANIEL, H.A./ELWELL, H.M./COX, M.B.

1943

INVESTIGATION IN EROSION CONTROL AND RECLAMATION OF ERODED LAND AT THE RED PLAINS CONSERVATION EXPERIMENT STATION, GUTHRIE, OKLAHOMA, 1930-1940.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 837, 94 P.

EXPERIMENTS IN METHODS OF EROSION CONTROL WERE CONDUCTED ON PLOTS OF VARIOUS SIZES, INDIVIDUAL TERRACES, AND TERRACED AND NATURAL WATERSHEDS UNDER DIFFERENT CONDITIONS OF VEGETATIVE COVER, CULTIVATION, CROPPING SYSTEM, OR TERRACE DESIGN, AND THE COMPARATIVE EFFECTIVENESS OF THESE CONDITIONS WAS MEASURED BY SOIL AND WATER LOSSES, CROP YIELDS, AND OBSERVATIONS. THE MOST EFFECTIVE METHOD OF CONTROLLING EROSION WAS WITH THICK-GROWING VEGETATION. OF THIS GRASS WAS THE BEST EROSION-RESISTANT COVER. DEGREES OF SOIL LOSS ARE GIVEN FOR GRASS TYPE, TILLAGE PRACTICES, AND CROP VARIETIES. SOIL LOSS ALSO INCREASED WITH GRADE. FERTILIZATION AFFORDED SOME INCREASE IN CROP YIELDS ON ERODED LAND, BUT RETURNS DID NOT JUSTIFY THE FERTILIZER TREATMENT. 25 REFERENCES.

DORTIGNAC, E.J.

1965

SURFACE RUNOFF AND EROSION AS AFFECTED BY SOIL RIPPING. IN PROCEEDINGS OF THE FEDERAL INTER-AGENCY SEDIMENTATION CONFERENCE, 1963, P. 156-165.

U.S. DEPARTMENT OF AGRICULTURE, MISCELLANEOUS PUBLICATION 970. 933P.

SHALE-DERIVED SOILS IN NEW MEXICO WERE EXAMINED FRO SURFACE RUNOFF AND EROSION CHANGES PRODUCED BY SOIL-RIPPING. THE AREA IS EXTREMELY OVERGRAZED. VEGETATION AND MULCHING OF THE RIPPED SOIL WERE THE TREATMENTS USED. SOIL RIPPING REDUCED RUNOFF ABOUT 97 PERCENT IN THE FIRST YEAR. THE EFFECT OF RIPPING PERSISTED EVEN WITHOUT VEGETATION IMPROVEMENT DURING THE THREE YEARS. EROSION WAS SIMILARLY REDUCED. 9 REFERENCES.

EDMINSTER, F.C.

1949

STREAMBANK EROSION CONTROL ON THE WINOOSKI RIVER, VERMONT.

U.S. DEPARTMENT OF AGRICULTURE, CIRCULAR 837, 54 P.

A SURVEY OF PRESENT LAND USE, INCLUDING FARMING AND LUMBERING, ON THE WINOOSKI WATERSHED WAS DONE. IT WAS FOUND THAT THE CLEAR-CUTTING METHODS USED SPEED EROSION. PHYSICAL CHARACTERISTICS, SUCH AS AMOUNT OF ICE ACTION, ARE PRESENTED. MEASURES FOR BANK PROTECTION AND THEIR RESULTS ARE INCLUDED. FENCING, VEGETATION COVER, MECHANICAL CONTROL, RIPRAP, BANK SLOPING, MATTING, DAMS, TREE DEFLECTORS, JETTY CONSTRUCTION, AND LEVEE CONSTRUCTION ARE AMONG MEASURES EXAMINED. 0 REFERENCES.

FOOD AND AGRICULTURE ORGANIZATION/DANISH INTERNATIONAL DEVELOPMENT AGENCY INTER-REGIONAL TRAINING CENTRE.

1974

REPORT ON THE FAO/DANIDA INTER-REGIONAL TRAINING CENTRE ON HEATHLAND AND SAND DUNE AFFORESTATION--DENMARK AND LIBYA, AUGUST 26- SEPTEMBER 21, 1973.

FOOD AND AGRICULTURE ORGANIZATION, ROME, FAO/DEN/TF 123. 239 P.

TOPICS OF THE LECTURES AND TOURS CONDUCTED AT THIS TRAINING SESSION INCLUDED: 1) GENERAL ECOLOGICAL AND VEGETATIVE INFORMATION FOR DUNE AREAS, 2) SOIL AND WATER CONSERVATION CONCEPTS, 3) STATISTICS FOR DUNE RESEARCH, 4) PHOTOGRAMMETRIC APPLICATIONS, 5) PROCESSES OF DUNE FORMATION, 6) STABILIZATION AND AFFORESTATION METHODS FOR DUNES, 7) PRINCIPLES OF AERODYNAMICS, 8) NURSERY MANAGEMENT TECHNIQUES, 9) CONCEPTS AND METHODS OF SHELTERBELT ESTABLISHMENT AND MANAGEMENT, AND 10) SILVICULTURAL CONSIDERATIONS OF DUNE AREA UTILIZATION. REFERENCES FOLLOW SOME PAPERS.

FRYREAR, D.W./KOSHI, P.T.

1971

CONSERVATION OF SANDY SOILS WITH A SURFACE MULCH.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 14(3):492-495.

A MULCH SURFACE COVER ON SANDY SOILS WILL REDUCE WIND EROSION, INCREASE SOIL MOISTURE STORAGE, IMPROVE DRY AGGREGATE STABILITY, AND INCREASE CROP YIELDS. THE PERCENT SOIL SURFACE COVERED WITH VARYING AMOUNTS OF COTTON GIN TRASH, WHEAT, AND SORGHUM STUBBLE WAS DETERMINED. THE PERCENT SOIL COVER WAS USED TO DEVELOP A MULCH COEFFICIENT (100 PERCENT SOIL COVER EQUALS A MULCH COEFFICIENT OF 1.0). THE MULCH COEFFICIENT WAS RELATED TO SOIL MOISTURE STORAGE, CROP YIELD, EVAPORATION, WIND EROSION LOSS, AND RUNOFF USING THE RESULTS OF THIS STUDY AND PREVIOUS RESEARCH BY OTHER SCIENTISTS. A MULCH COEFFICIENT OF 0.6 TO 0.8 WAS SUFFICIENT TO CONTROL WIND EROSION AND RUNOFF. GOOD SOIL MOISTURE STORAGE, EVAPORATION REDUCED, AND CROP YIELDS HAVE BEEN OBTAINED WITH MULCH COEFFICIENT OF 1.0. TEN REFERENCES.

GIFFORD, G.F.

1975

BENEFICIAL AND DETRIMENTAL EFFECTS OF RANGE IMPROVEMENT PRACTICES ON RUNOFF AND EROSION. IN SYMPOSIUM ON WATERSHED MANAGEMENT, LOGAN, UTAH, AUGUST 11-13, 1975, PORCEEDINGS, P. 216-248.

AMERICAN SOCIETY OF CIVIL ENGINEERS. AVAILABLE FROM NEW YORK OFFICE.

THIS PAPER REVIEWS BENEFICIAL AND DETRIMENTAL EFFECTS OF RANGE IMPROVEMENT PRACTICES ON RUNOFF AND EROSION, INCLUDING PITTING, RIPPING (CHISELING, SUBSOILING), PLOWING, CHAINING, BURNING, SEEDING, CONTOUR FURROWS, CONTOUR TRENCHES, GULLY PLUGS, SMALL RESERVOIR CONSTRUCTION, AND WATERSPREADING. NOT ALL RANGE IMPROVEMENT PRACTICES ARE BENEFICIAL FROM THE STANDPOINT OF RUNOFF AND SEDIMENT PRODUCTION. IF ADEQUATE VEGETATION HAS BEEN ESTABLISHED AND MAINTAINED, IMPROVEMENTS IN HYDROLOGIC BEHAVOIR ARE GENERALLY NOTED (ASSUMING A DEGRADED CONDITION TO START). 82 REFERENCES.

HAGEN, L.J./SKIDMORE, E.L./DICKERSON, J.D.

1972

DESIGNING NARROW STRIP BARRIER SYSTEMS TO CONTROL WIND EROSION.

JOURNAL OF SOIL AND WATER CONSERVATION 27(6):269-272.

ADDITIONAL FACTORS TO CONSIDER IN THE DESIGN OF NARROW STRIP BARRIER SYSTEMS FOR WIND EROSION CONTROL INCLUDE BARRIER CAPACITY AND TRAPPING EFFICIENCY (TE) OR THE PERCENTAGE OF SOIL ENTERING A BARRIER STRIP THAT IS RETAINED. A PREDICTION EQUATION FOR TE WAS DEVELOPED FROM WIND TUNNEL TESTS AND CAN BE USED TO OBTAIN AN INITIAL SPACING FOR BARRIERS WITH 100 PERCENT TE, BUT THE INITIAL SPACING MUST BE REDUCED IN PROPORTION TO TE TO AVOID EXCESSIVE SOIL MOVEMENT. 7 REFERENCES.

HARRIS, W.S./WATSON, W.S., JR.

1971

GRADED ROWS FOR THE CONTROL OF RILL EROSION.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 14(3):577-581. SWRA W73-04979.

IN 1963 A STUDY WAS DONE IN ARKANSAS TO DEFINE THE DESIGN, CONSTRUCTION, AND MAINTENANCE REQUIREMENTS FOR GRADED ROWS AND THEIR WATER-DISPOSAL SYSTEMS. HILL TOPOGRAPHY WAS GRADED FOR CONTOUR GRADED ROWS AND RELATIVELY STEEP BOTTOM LAND WAS GRADED FOR CONTROLLED EROSION AND SEDIMENTATION. WHEN PROPERLY CONSTRUCTED AND MAINTAINED, GRADED ROWS ELIMINATED EROSION ON HILL LAND AND PERMITTED CONTROLLED EROSION AND SEDIMENTATION ON BOTTOM LAND. NINE REFERENCES.

HAUPT, H.F.

1959

A METHOD FOR CONTROLLING SEDIMENT FROM LOGGING ROADS.

U.S. FOREST SERVICE, INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION, OGDEN, UTAH, MISCELLANEOUS PUBLICATION 22. 22 P.

CONDITIONS CONDUCIVE TO SEVERE EORSION ARE LIKELY TO OCCUR SHORTLY AFTER LOGGING ROAD ABANDONMENT AND BEFORE NEW PLANT COVER CAN PROVIDE CONTROL. IN ORDER TO PROVIDE A METHOD WHICH WOULD CONTAIN NORMAL AND ABNORMALLY SEVERE RUNOFF EVEN WHILE THE ROAD WAS NEW AND MOST VULNERABLE TO EROSION, AND WHICH WOULD RELY MORE ON CROSS DITCHES THAN ON REVEGETATION, A MULTIPLE REGRESSION EQUATION WAS DEVISED BASED ON SLOPE OBSTRUCTION INDEX, CROSS DITCH INTERVALS SQUARED, SLOPE LENGTH, AND CROSS DITCH INTERVAL TIMES ROAD GRADIENT. THIS METHOD OF PREDICTING NECESSARY MEASURES FOR ROAD LOCATION AND TREATMENT PROVIDES FLEXIBILITY BECAUSE BOTH THE CROSS DITCH INTERVAL VARIABLE AND THE SLOPE OBSTRUCTION INDEX CAN BE DIRECTLY CONTROLLED. NEXT TO A GOOD JOB OF LOCATING AND BUILDING ROADS, CLOSE SPACING OF CROSS DITCHES PROVIDES THE MOST ECONOMICAL WAY OF PREVENTING DOWNSLOPE EROSION. GUIDES TO APPLYING THIS CONTROL METHOD BEFORE CONSTRUCTION AND AFTER ROAD ABANDONMENT ACCORDING TO THE WIDTH OF PROTECTIVE STRIPS BELOW THE ROAD ARE INCLUDED. HOWEVER, THIS METHOD IS NOT TOTALLY RELIABLE; FOREST MANAGERS SHOULD ADD A SAFETY MARGIN BY MAKING THE PROTECTIVE STRIP NEEDED FOR TRAPPING SEDIMENT WIDER THAN INITIALLY CALCULATED. ONE REFERENCE.

HEEDE, B.H.

1968

ENGINEERING TECHNIQUES AND PRINCIPLES APPLIED TO SOIL EROSION CONTROL.

U.S. FOREST SERVICE, ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION, FT. COLLINS, COLORADO, RESEARCH NOTE RM-102. 7 P.

TWO BASIC APPROACHES TO EROSION CONTROL ARE 1) RESISTING NATURAL FORCES AND 2) UTILIZING THEM. EXAMPLES OF THE FIRST ARE CHECK DAMS AND GRASSED WATERWAYS. AN EXAMPLE OF THE SECOND IS ITALIAN HYDRAULIC RECLAMATION WHERE EROSIVE FORCES ARE USED TO STABILIZE WATERSHEDS. THE OBJECTIVES OF BOTH APPROACHES IS TO ESTABLISH A VEGETATIVE COVER. ROCK RIPROP IS USED ON CHECK DAMS. CRITERIA FOR WATERWAY DESIGN ARE PRESENTED. THE RESEARCH FINDINGS WERE ALL MADE AT THE STATION IN FORT COLLINS. 11 REFERENCES.

HICKEY, W.C., JR./DORTIGNAC, E.J.

1964

AN EVALUATION OF SOIL RIPPING AND SOIL PITTING ON RUNOFF AND EROSION IN THE SEMIARID SOUTHWEST.

INTERNATIONAL ASSOCIATION OF SCIENTIFIC HYDROLOGY, PUBLICATION 65:22-33.

A STUDY WAS BEGUN IN 1958 IN NEW MEXICO TO EVALUATE THE RELATIVE EFFECTIVENESS AND DURATION OF MECHANICAL TREATMENTS PRODUCED BY A SOIL RIPPER AND SOIL PITTER. SUBSOIL RIPPING WAS MORE EFFECTIVE IN REDUCING RUNOFF AND EROSION FROM TEST PLOTS THAN WERE ARTIFICIALLY BUILT DEPRESSIONS OR PITS. FOR UNTREATED SOILS, SURFACE RUNOFF WAS AS HIGH AS 89 PERCENT OF STORM RAINFALL, EROSION AS HIGH AS 4,000 POUNDS PER ACRES. RIPPING REDUCED SURFACE RUNOFF 96 PERCENT AND EROSION 85 PERCENT IN THE FIRST YEAR AFTER TREATMENT. THREE YEARS AFTER TREATMENT, THE REDUCTIONS AMOUNTED TO 85 PERCENT FOR RUNOFF AND 31 PERCENT FOR EROSION. SURFACE PITS CAUSED REDUCTIONS OF ONLY 12 TO 24 PERCENT OF SURFACE RUNOFF AND 16 PERCENT IN EROSION THE FIRST YEAR AFTER TREATMENT. AFTER 3 YEARS, RUNOFF WAS REDUCED ONLY 10 PERCENT AND EROSION WAS ABOUT THE SAME FROM TREATED AND CHECK PLOTS. ON SOME OF THE UNTREATED PLOTS ON THE RIPPED SITE, SUBTERRANEAN CHANNELS WERE FORMED AND RUNOFF WAS OCCURRING BELOW THE SURFACE OF THE GROUND. IT IS POSSIBLE THAT THE MECHANICAL TREATMENTS INITITATED OR SPEEDED UP THIS SOIL PIPING. FOUR REFERENCES.

JACOBSON, P.

1969

SOIL EROSION CONTROL PRACTICES IN PERSPECTIVE.

JOURNAL OF SOIL AND WATER CONSERVATION 24(4):123-126.

REVIEWS EROSION CONTROL PRACTICES IN THE CORN BELT INCLUDING CONTOURING, CROP ROTATING, STRIP CROPPING, AND TERRACING. ONE OF THE FIRST MINIMUM-TILLAGE METHODS, THE PLOW-PLANT METHOD HAS LIMITED USE IN MAJOR CORN-PRODUCING AREAS DUE TO SLOW PLOWING AND MINIMUM DAYS OF FAVORABLE WEATHER. EROSION CAN BE CUT IN HALF BY USING NO-PLOW, TILL-PLANT EQUIPMENT, ALLOWING FOR CONSIDERABLE GRADE IN THE ROWS AND STILL KEEPING EROSION WITHIN PERMISSIBLE LIMITS. IF A FEDERAL PROGRAM OF PRODUCTION CONTROL WERE USED EFFECTIVELY, LANDS WITH STEEP SLOPES AND SHALLOW SOILS COULD BE RETIRED PERMANENTLY FROM ROW-CROP PRODUCTION. ANOTHER PRACTICE THAT CAN PROVIDE EROSION CONTROL IN THE CORN BELT INVOLVES WATER CONTROL BY STORAGE FILLS CONSTRUCTED OVER WATERWAYS. AN EROSION-CONTROL PROGRAM IS PROPOSED. 10 REFERENCES.

KIDD, W.J./KOCHENDERFER, J.N.

1973

SOIL CONSTRAINTS ON LOGGING ROAD CONSTRUCTION ON STEEP LAND EAST AND WEST (PART 5 OF MANAGING STEEP LAND).

JOURNAL OF FORESTRY 71(5):284-286.

MAJOR ROAD BUILDING PROBLEMS ARE THE EROSION HAZARD DUE TO SOIL STABILITY, SLOPE, AND STORM FREQUENCY; SLUMPING DUE TO SOIL MANTLE FAILURE; SOIL COMPACTION DUE TO HEAVY EQUIPMENT USED; LACK OF PROPER DRAINAGE; AND SOIL AND ROCK TYPES IN THE LOGGING AREA. HOWEVER, THE AMOUNT OF EROSION AND SEDIMENTATION CAN BE REDUCED BY THE MOBILE-SPAR SYSTEM, GREATER CARE IN CONSTRUCTION (SUCH AS A LOW GRADE, UNDER-THE-ROAD CULVERTS), VERTICAL CUTBANKS TO PREVENT UNRAVELLING HILLSIDES, AND COVERING THE RAW FILL SLOPES WITH STRAW MULCH HELD IN PLACE BY NETTING. SKID TRAILS SHOULD BE TREATED THE SAME WAY AS LOGGING ROADS TO AVOID EROSION. SELECTED REFERENCES FOR WESTERN AND EASTERN STEEP LANDS ARE INCLUDED. 18 REFERENCES.

KRAMMES, J.S./HELLMERS, H.

1963

TESTS OF CHEMICAL TREATMENTS TO REDUCE EROSION FROM BURNED WATERSHEDS.

JOURNAL OF GEOPHYSICAL RESEARCH 68(12):3667-3672.

THE RESULTS OF LABORATORY AND FIELD TESTS IN SOUTHERN CALIFORNIA TO INVESTIGATE CHEMICAL TREATMENTS THAT MIGHT PROTECT A DENUDED SOIL SURFACE UNTIL A VEGETATIVE COVER BECOMES EFFECTIVE ARE REPORTED. PURE AND WET WATER AND SEVERAL SOIL-BINDING CHEMICALS WERE TESTED. THE CHEMICAL SOIL BINDERS USED IN PLOT TESTS DID NOT REDUCE SURFACE RUNOFF AND DEBRIS PRODUCTION. THE THIN CRUST OF SOIL FORMED BY THE CHEMICAL BINDER INCREASED SURFACE RUNOFF AND DEBRIS PRODUCTION. A WET WATER TREATMENT RESULTED IN ADDED INFILTRATION AND LESS RUNOFF BUT IN HIGHER DEBRIS-CARRYING CAPACITY PER UNIT VOLUME OF RUNOFF. 7 REFERENCES.

KURIAN, K.

1973

STUDIES ON BENCH TERRACING IN NILGIRIS.

SOIL CONSERVATION DIGEST 1(1):36-44.

BASIS FOR DETERMINING THE SPECIFICATIONS OF BENCH TERRACING IN INDIA, FROM THE FIELD OBSERVATIONS ON RUNOFF, SOIL LOSS/SOIL MOISTURE AND YIELD OF POTATO ARE DISCUSSED. DIFFERENT SUB-TYPES OF BENCH TERRACES WITH A VIEW TO EVOLVE A CHEAPER METHOD OF CONSTRUCTION AND TO PREVENT EXPOSURE OF SUB-SOIL ARE DISCUSSED. DATA ON COST OF CONSTRUCTION, AREA LOST, MOISTURE STATUS, YIELD OF CROPS HAVE SHOWN THAT PUERTO RICAN TERRACES WITH THE VEGETATIVE BARRIER IS PRACTICALLY FEASIBLE AND ECONOMICALLY DESIRABLE. STUDIES HAVE SHOWN THAT 2 PERCENT INWARD GRADE APPEARS TO BE THE MOST ACCEPTABLE ONE. 11 REFERENCES.

LIVINGSTON, J.B./DOMINY, P./ALEXANDER, E.L.

1967

INSTALLATION OF PARALLEL TERRACES.

JOURNAL OF SOIL AND WATER CONSERVATION 22(5):186-194.

PRESENTS IN THREE SECTIONS, THE METHODS USED IN THE MIDWEST, SOUTHEAST, AND SOUTHWEST FOR TERRACE CONSTRUCTION. TECHNIQUES USED IN THE MIDWEST FOR OBTAINING PARALLEL ALIGNMENT INCLUDE: 1) CUT AND FILL METHOD, 2) DEVELOPING SHORTER SEGMENTS OF TERRACES BY BREAKING TERRACES AT RIDGES AND DEVELOPING MULTIPLE OUTLETS, 3) VARYING DEPTH OF CUTS AND CHANNEL GRADES, AND 4) USING TILE OUTLETS. ESTABLISHING A COMPLETE WATER DISPOSAL SYSTEM IS ONE WAY TO IMPROVE EQUIPMENT EFFICIENCY AND INCREASE SOIL PRODUCTIVITY ON SLOPING LAND IN THE SOUTHWEST. POSSIBLE CONSERVATION PRACTICES THAT MAY BE USED IN DEVELOPING A COMPLETE WATER DISPOSAL SYSTEM: 1) VEGETATED OUTLETS OR WATERWAYS, 2) TERRACES, 3) LAND SMOOTHING FOR IMPROVED DRAINAGE, 4) RELOCATION OF FARM ROADS AND FENCES, 5) LAND USE ADJUSTMENTS, 6) DRAINAGE, AND 7) IMPROVED CROPPING SYSTEMS. IN THE SOUTHEAST, GRID SURVEYS ARE USED FOR PARALLEL TERRACE SYSTEM ADVANCE PLANNING. 4 REFERENCES.

LYLES, L./ALLISON, B.E.

1975

WIND EROSION: UNIFORMLY SPACING NONERODIBLE ELEMENTS ELIMINATES EFFECTS OF WIND DIRECTION VARIABILITY.

JOURNAL OF SOIL AND WATER CONSERVATION 30(5):225-226.

WIND TUNNEL STUDIES SUGGEST THAT EQUIDISTANT SPACING OF NONERODIBLE ELEMENTS, SUCH AS PLANTS AT VARIOUS POPULATIONS, PROVIDES EQUAL PROTECTION FROM WIND EROSION, REGARDLESS OF WIND DIRECTION. DISADVANTAGES OF EQUIDISTANT PLANT SPACINGS INVOLVE MORE DIFFICULT PLANTING, HARVESTING, AND WEED CONTROL. 12 REFERENCES.

MANNERING, J.V./MEYER, L.D.

1963

THE EFFECTS OF VARIOUS RATES OF SURFACE MULCH ON INFILTRATION AND EROSION.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS 27(1):84-86.

THE EFFECTS OF SIX RATES OF APPLIED WHEAT STRAW MULCH ON INFILTRATION AND EROSION WERE STUDIED ON A HIGHLY PERMEABLE WEA SILT LOAM WITH 5 PERCENT SLOPE. SERIES OF SIMULATED RAINSTORMS TOTALING 6.25 INCHES AT AN INTENSITY OF 2.5 INCHES PER HOUR WERE USED TO EVALUATE THE TREATMENTS. MULCH APPLICATIONS OF 1, 2, AND 4 TONS PER ACRE MAINTAINED VERY HIGH INFILTRATION RATES RESULTING IN ESSENTIALLY NO EROSION. THE 0.25 TON AND 0.5 TON MULCH APPLICATION LOST 3 TONS AND 1 TON OF SOIL PER ACRE, RESPECTIVELY, WHEREAS THE CHECK (NO MULCH) TREATMENT LOST 12 TONS PER ACRE. BENEFITS WHICH WERE INDICATED FROM THE MULCHING WERE: 1) REDUCED SOIL SURFACE SEALING AS EVIDENCED BY HIGHER INFILTRATION RATES, AND 2) DECREASED RAINFALL AND RUNOFF ENERGY FOR PARTICLE DETACHMENT AND TRANSPORT AS EVIDENCED BY REDUCED SOIL CONTENT IN THE RUNOFF. 9 REFERENCES.

MARLATT, W.E./HYDER, D.N.

1970

SOIL RIDGING FOR REDUCTION OF WIND EROSION FROM GRASS SEEDBEDS.

JOURNAL OF RANGE MANAGEMENT 23(3):170-174.

REVIEWS RESEARCH ATTEMPTS TO CONVERT GRASSLAND REGION OF EASTERN COLORADO INTO A DRYLAND FARMING ECONOMY. IN ADDITION, THE EFFECTIVENESS OF RIDGING TO PROTECT SEED BEDS FROM EROSION WAS STUDIED BOTH IN THE FIELD AND IN A WIND TUNNEL FACILITY WITH A MODEL. TUNNEL RESULTS INDICATE THAT THE LEAST REDUCTION IN WIND VELOCITY WITH A SPEED OF EITHER 13.6 MILES PER HOUR (MPH) OR 34.1 MPH IS DIRECTLY ABOVE RIDGE TOPS WHILE THE GREATEST REDUCTIONS ARE ABOVE FURROWS. FIELD EXPERIMENTS INDICATED THAT AMOUNG THE FOUR PERIODS OF INVESTIGATION, AMOUNTS OF RIDGE EROSION AND FURROW FILL INCREASED IN APPROXIMATE RELATION TO THE AMOUNTS OF PRECIPITATION. 6 REFERENCES.

MCKINZIE, W.E./SCOTT, R.F.

1966

LEVELING THE MOUNTAIN SIDES.

JOURNAL OF SOIL AND WATER CONSERVATION 21(1):28.

BENCH TERRACES HAVE BEEN USED ON ST. THOMAS ISLAND (VIRGIN ISLANDS) TO IMPROVE SMALL FARMS ON STEEP, STONY, MOUNTAINOUS SOILS. ROCK BARRIERS FORM PERMANENT BASES FOR THE TERRACES WHICH ARE 13 FEET APART ON A 10-15 PERCENT SLOPE AND HAVE A MINIMUM SOIL DEPTH OF 2 FEET. ON 40-45 PERCENT SLOPES THE SPACING IS ABOUT 11 FEET WITH SOIL DEPTH OF 3-4 FEET. CROPS CAN BE GROWN THROUGHOUT THE YEAR. INCOME FROM THESE FARMS HAS IMPROVED. 0 REFERENCES.

MEYER, L.D./WISCHMEIER, W.H./FOSTER, G.R.

1970

MULCH RATES REQUIRED FOR EROSION CONTROL ON STEEP SLOPES.

SOIL SCIENCE SOCIETY OF AMERICA, PROCEEDINGS, 34:928-931.

THE EROSION-REDUCING EFFECTIVENESS OF SIX RATES OF STRAW MULCH WAS TESTED ON SLOPES AVERAGING 15 PERCENT. MULCH RATES OF ONLY 0.56 AND 1.12 METRIC TONS PER HECTARE REDUCED SOIL LOSSES TO LESS THAN ONE THIRD OF THOSE FROM UNMULCHED AREAS DURING A SERIES OF INTENSE SIMULATED RAINSTORMS. A 2.24 METRIC TONS PER HECTARE RATE DECREASED LOSS TO ONLY 18 PERCENT AND THE 4.48 AND 8.96 METRIC TONS PER HECTARE REDUCED IT TO LESS THAN 5 PERCENT. THE REDUCED RUNOFF VELOCITY DUE TO MULCHING ACCOUNTED FOR MUCH OF THE DECREASE. 14 REFERENCES.

MEYER, L.D./JOHNSON, C.B./FOSTER, G.R.

1972

STONE AND WOODCHIP MULCHES FOR EROSION CONTROL ON CONSTRUCTION SITES.

JOURNAL OF SOIL AND WATER CONSERVATION 27(6):264.

A BORROW-PIT SIDESLOPES WAS TESTED IN INDIANA FROM 1971 TO 1972 FOR EROSION CONTROL WITH VARYING APPLICATIONS OF STRAW MULCH, CRUSHED STONE, GRAVEL, WOOD CHIPS AND PORTLAND CEMENT. SOILS COVERED WITH ONE INCH OF STONE MULCH PROVED MUCH LESS ERODIBLE THAN THOSE WITH MORE THAN TWO TONS PER ACRE OF STRAW. HEAVIER RATES OF STONE OR 1 1/2 INCHES OF WOOD CHIPS WERE EVEN MORE EFFECTIVE. GOOD TO EXCELLENT STANDS OF GRASS WERE OBTAINED ON MANY OF THE STONE AND WOOD-CHIP TREATMENTS FOLLOWING EROSION TESTS BY SIMILATED RAINFALL AND WATER INFLOW. 12 REFERENCES.

MEYER, L.D./WISCHMEIER, W.H./DANIEL, W.H.

1971

EROSION, RUNOFF, AND REVEGETATION OF DUNUDED CONSTRUCTION SITES.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 14(1):138-141.

AFTER SOIL EROSION AND RUNOFF WERE MEASURED FROM 6 CONDITIONS TYPICAL OF DENUDED LAND AREAS, THE EFFECTIVENESS OF VARIOUS REVEGETATION PRACTICES WAS STUDIED ON THE SAME AREAS. A SERIES OF SIMULATED RAINSTORMS RESULTED IN LARGE AMOUNTS OF EROSION AND RUNOFF AND THE ONLY EFFECTIVE EROSION CONTROL WAS STRAW MULCH, WHICH REDUCED SOIL LOSS TO LESS THAN 10 TONS PER ACRE. OF THE FIVE REVEGETATION TREATMENTS, APPLIED TOPSOIL WAS THE MOST SUCCESSFUL. MULCHED SUBPLOTS WERE SUPERIOR TO UNMULCHED AND REWORKED AREAS HAD BETTER STANDS THAN UNTILLED AREAS. A FESCUE-BLUEGRASS MIXTURE WAS MUCH BETTER THAN BLUEGRASS ALONE. 24 REFERENCES.

MOLDENHAUER, W.C./AMEMIYA, M.

1969

TILLAGE PRACTICES FOR CONTROLLING CROPLAND EROSION.

JOURNAL OF SOIL AND WATER CONSERVATION 24(1):19-21.

PARALLEL TERRACES AND CERTAIN TILLAGE PRACTICES ARE PRESENTED AS ACCEPTABLE ALTERNATIVES TO SOD-BASED ROTATIONS FOR CONTROLLING EROSION IN THE CORN BELT. PLOW-PLANT AND WHEEL-TRACK PLANTING METHODS, THOUGH NOT USED EXTENSIVELY, ARE VALUABLE BECAUSE FEWER OPERATIONS ARE PERFORMED TO PREPARE SOIL FOR PLANTING. TWO VARIATIONS OF TILL PLANTING, A NO-PLOW METHOD, ARE BEING STUDIED IN OHIO AND UTAH. THE TWO METHODS ARE NO-TILLAGE AND RIDGE-FARMING, AND HAVE BEEN FOUND TO REDUCE OR ELIMINATE MANY DIFFICULTIES ENCOUNTERED IN EARLIER RESIDUE MANAGEMENT SYSTEMS. 29 REFERENCES.

MOLDENHAUER, W.C. ET AL

1971

EFFECT OF ROW GRADES AND TILLAGE SYSTEMS ON SOIL AND WATER LOSSES.

JOURNAL OF SOIL AND WATER CONSERVATION 26(5):193-195.

THREE TILLAGE METHODS WERE COMPARED IN IOWA FOR THEIR EFFECTIVENESS IN CONTROLLING SOIL AND WATER LOSSES WITH UP-AND DOWN-HILL PLANTING ON SLOPES RANGING FROM 3.4 TO 9 PERCENT USING A ROTATING-BOOM RAINFALL SIMULATOR. OF THE THREE METHODS (TILL PLANTING, RIDGE PLANTING AND CONVENTIONAL PLANTING), RIDGE PLANTING PROVED TO BE THE MOST EFFECTIVE MEANS OF CONTROLLING SOIL LOSSES. SLOPE HAD NO AFFECT ON SOIL AND WATER LOSSES UNDER THIS METHOD. 15 REFERENCES.

MUHAMMAD, I.

1968

WATERSHED MANAGEMENT AND SOIL EROSION PROBLEMS IN WEST PAKISTAN.

PAKISTAN JOURNAL OF SCIENCE 20(5/6):234-256.

EXAMINES THE PRESENT STATE OF THE PROBLEM OF SOIL EROSION IN WEST PAKISTAN, PAST EXPERIENCES IN EROSION CONTROL, AND FUTURE PROSPECTS. THE MAIN PURPOSE OF THE SOIL AND WATER CONSERVATION MEASURES IS TO REDUCE THE STATE OF RESERVOIR SILTATION AND TO IMPLEMENT A RATIONAL LAND DEVELOPMENT PROGRAM. PAST EXPERIENCE HAS SHOWN THAT THE SIMPLE MEASURES (SIMPLEST ENGINEERING STRUCTURES, FOREST MELIORATION, AND TERRACING) ARE PERFECTLY EFFECTIVE, BUT THEIR IMPLEMENTATION IS SLOWED DOWN BY THE ILLITERACY AND POVERTY OF THE POPULATION AND BY THE SYSTEM OF SMALL LAND OWNERSHIP. EROSION CONTROL IN WEST PAKISTAN IS A SOCIAL, ECONOMIC, AND POLITICAL PROBLEM AND NOT NECESSARILY A TECHNICAL ONE. BECAUSE OF EROSION THE INDUS RIVER CARRIES 700 MILLION TONS OF SEDIMENTS, 91 PERCENT OF THIS IN A 2.5 MONTH PERIOD. TWO DAMS WERE CONSTRUCTED AND A THIRD IS PLANNED FOR EROSION CONTROL, IRRIGATION, AND ENERGY PRODUCTION. A SECOND 6 MONTH PLAN FOR EROSION CONTROL WAS WORKED OUT. THE APPENDICES PRESENT DATA ON THE DISTRIBUTION OF ARABLE LAND, POPULATION DENSITY IN CATCHMENTS, IRRIGATED LAND, FLOOD WATER, AND SOLID DISCHARGES FOR SEVERAL RIVERS,

OSBORN, B.

1955

HOW RAINFALL AND RUNOFF ERODE SOIL. IN WATER, THE YEARBOOK OF AGRICULTURE, P. 126-135.

U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.

A DETAILED DISCUSSION OF THE CAUSES AND EFFECTS OF RAIN AND RUNOFF CAUSED EROSION IS PRESENTED. A COMBINATION OF MECHANICAL MEASURES AND PLANT COVER DESIGNED TO MEET THE COMBINATION OF EROSION FACTORS OPERATING ON A PARTICULAR LAND AREA IS SUGGESTED FOR EFFECTIVE EROSION CONTROL. 11 REFERENCES.

PLASS, W.T.

1973

CHEMICAL SOIL STABILIZERS FOR SURFACE MINE RECLAMATION. IN SOIL EROSION: CAUSES AND MECHANISMS, PREVENTION AND CONTROL, P. 118-122.

NATIONAL RESEARCH COUNCIL, HIGHWAY RESEARCH BOARD, SPECIAL REPORT 135.

SUCCESSFUL STABILIZATION OF SURFACE MINE SPOILS AND OTHER DRASTICALLY DISTURBED AREAS DEPENDS ON THE ESTABLISHMENT OF A GRASS AND LEGUME COVER. MULCHES AND SOIL STABILIZERS MAY BE USED ON THESE SITES TO HELP ESTABLISH VEGETATION AND REDUCE EROSION. THE SELECTION OF AN APPROPRIATE MULCH OR SOIL STABILIZER IS COMPLICATED BY THE NUMBER OF PRODUCTS THAT ARE COMMERCIALLY AVAILABLE AND BY THE SCARCITY OF INFORMATION ON THEIR EFFECTIVENESS. TWO COOPERATIVE DEMONSTRATIONS COMPARED VEGETATION ESTABLISHMENT AND EROSION LOSS FOLLOWING 30 TREATMENTS WITH SIX MULCHES AND 12 SOIL STABILIZERS. THERE IS NO EVIDENCE THAT THESE MATERIALS ARE NECESSARY FOR VEGETATION ESTABLISHMENT; THEY ARE USED PRIMARILY TO CONTROL EROSION. MULCH, SOIL STABILIZER, AND SOIL STABILIZER-MULCH TREATMENTS WERE EFFECTIVE. 0 REFERENCES.

POPE, J.B. ET AL

1946

INVESTIGATIONS IN EROSION CONTROL AND RECLAMATION OF ERODED SANDY CLAY LANDS OF TEXAS, ARKANSAS, AND LOUISIANA AT THE CONSERVATION EXPERIMENT STATION, TYLER, TEXAS, 1931-1940.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 916, 76 P.

RESULTS OF 10 YEARS OF RESEARCH RELATING TO SOIL AND WATER CONSERVATION IN THE TEXAS-ARKANSAS-LOUISIANA SANDY LANDS REGION ARE REPORTED. THE CHIEF AIMS OF THESE INVESTIGATIONS WERE TO ESTABLISH RATINGS ON SOIL AND WATER LOSSES FOR THE PROBLEM AREA, TO DEVELOP BETTER METHODS OF CONSERVING TOPSOIL, AND TO MAINTAIN ITS FERTILITY. THE EFFECT OF SUCH FACTORS AS RAINFALL CHARACTERISTICS, SOIL SERIES, SLOPE, PLANT COVER, CROPPING SYSTEMS, STRIP CROPPING, TERRACING, AND LAND USE ON SOIL AND WATER LOSSES WERE STUDIED. THE MOST EFFECTIVE METHOD OF CONTROL FOUND IS TO USE GRASS OR FOREST FOR COVER. CROP PRODUCTION PROVIDES COVER ONLY WHEN COMBINED WITH TERRACING. 13 REFERENCES.

RICHARDSON, C.W./BAIRD, R.W./FRYREAR, D.W.

1969

GRADED FURROWS FOR WATER EROSION CONTROL.

JOURNAL OF SOIL AND WATER CONSERVATION 24(2):60-63. SWRA W69-06746.

A SYSTEM OF FURROWS WITH A 1 PERCENT GRADE WAS CONSTRUCTED IN TEXAS IN 1964 AND SEDIMENT DATA WAS COLLECTED FOR 1964 THROUGH 1967. THE USE OF THE FURROWS FOR EROSION CONTROL REQUIRED CONSTANT MAINTENANCE BUT OPERATING FARM EQUIPMENT WAS NOT APPRECIABLY MORE DIFFICULT AND CROP YIELDS WERE COMPARABLE TO FLAT-TILLED AREAS. THE FURROWS APPEARED TO BE A SUCCESSFUL METHOD FOR INCREASING EFFICIENCY WHILE CONTROLLING EROSION. FOUR REFERENCES.

SCHMIDT, B.L./TAYLOR, G.S./MILLER, R.W.

1969

EFFECT OF CORN STEEP LIQUOR FOR EROSION CONTROL AND VEGETATIVE ESTABLISHMENT ON HIGHWAY BACKSLOPES.

AGRONOMY JOURNAL 61(2):214-217.

APPLICATION OF 5 AND 10 PERCENT CORN LIQUOR SLURRY FOLLOWED IMMEDIATELY WITH LIME SLURRY FORMED A THIN STABILIZED SURFACE LAYER THAT RESISTED INITIAL EROSION ON BACK SLOPE PLOTS AFTER SEEDING IN OHIO. PLANT GROWTH, COVER, AND EROSION CONTROL OVER A GROWING SEASON WERE THE GREATEST UNDER STRAW MULCH, WITH NO DIFFERENCES NOTED FROM THE VARIOUS CORN-STEEP LIQUOR TREATMENTS BY THE END OF THE SEASON. RILLING EVENTUALLY OCCURRED ON ALL PLOTS EXCEPT THOSE WITH STRAW MULCH. 7 REFERENCES.

SIDDOWAY, F.H.

1965

EFFECT OF KIND, AMOUNT, AND PLACEMENT OF RESIDUE ON WIND EROSION CONTROL.

KANSAS STATE UNIVERSITY (PH.D. DISSERTATION). 121 P.

DIFFERENT VEGETATIVE SURFACES WERE SIMULATED IN A LABORATORY WIND TUNNEL, AND THE SOIL LOSS RESULTING FROM EXPOSURE TO THE GENERATED WIND WAS DETERMINED. THE DEPENDENT VARIABLE, SOIL LOSS E, WAS MEASURED UNDER VARIOUS LEVELS OF THE INDEPENDENT VARIABLES: KINDS OF VEGETATION, PLACEMENT OF VEGETATION, QUANTITY OF VEGETATION, WIND DRAG VELOCITY, AND SOIL CLODDINESS. THREE CROP RESIDUES--WHEAT STUBBLE; FINE-TEXTURED SORGHUM STUBBLE; AND COARSE-TEXTURED SORGHUM STUBBLE, QUANTITATIVELY DIFFERENTIATED BY THEIR STALK DIAMETERS--AND GROWING WINTER WHEAT COMPRISED THE KIND OF VEGETATION VARIABLE. THE RELATIVE EFFECTIVENESS OF THE DIFFERENT KINDS OF VEGETATION WAS INFLUENCED BY PLACEMENT. THE ESTIMATED QUANTITY OF STANDING WHEAT STUBBLE NEEDED TO PROVIDE ADEQUATE EROSION CONTROL AVERAGED ONLY 0.20 AND 0.06 OF THE QUANTITY NEEDED FOR FINE SORGHUM AND COARSE SORGHUM, RESPECTIVELY. THE CORRESPONDING RATIOS FOR LEANING AND FLATTENED STUBBLE WERE 0.32 AND 0.09, AND 0.43 AND 0.20, RESPECTIVELY.

SIDDOWAY, F.H.

1970

BARRIERS FOR WIND EROSION CONTROL AND WATER CONSERVATION.

JOURNAL OF SOIL AND WATER CONSERVATION 25(5):180-184.

MULTIPLE-ROW SHELTERBELTS HAVE GIVEN WAY TO SINGLE-ROW BELTS IN THE GREAT PLAINS BECAUSE OF: 1) THE LARGE PROPORTION OF LAND OCCUPIED BY MULTIPLE-ROW BELTS; 2) THE NONUNIFORM DISTRIBUTION OF SNOW, AND 3) RESEARCH AND EXPERIENCE SHOWING THE COMPARATIVE HIGH PERFORMANCE OF SINGLE-ROW BELTS. THE 1.2 MILLION ACRES OF WIND BARRIER PLANTINGS IN THE PLAINS STATES ARE MOSTLY IN THE MORE HUMID PORTIONS BUT RESEARCH HAS SHOWN THAT CROP YIELD INCREASES ATTRIBUTABLE TO BARRIERS ARE BEST IN DRY CLIMATES. 21 REFERENCES.

SMITH, D.D.

1941

INTERPRETATION OF SOIL CONSERVATION DATA FOR FIELD USE.

AGRICULTURAL ENGINEERING 22(5):173-175.

DATA SECURED FROM EXPERIMENTAL PLOTS OF SHELBY SOIL IN MISSOURI WERE EXTRAPOLATED FOR FIELD USE BY MODIFICATION OF AN EQUATION WHICH PROVIDED FOR THE EFFECT OF SOIL-CLIMATE-CROP TREATMENT, LENGTH AND DEGREE OF SLOPE, AND MECHANICAL CONSERVATION PRACTICES ON SOIL LOSS. THE FOLLOWING CONCLUSIONS WERE REACHED. A SOIL LOSS OF NOT MORE THAN 4 TONS PER ACRE PER YEAR WAS SUGGESTED AS A RATE WHICH WOULD ALLOW MAINTENANCE OF FERTILITY. SOIL TREATMENTS WERE IMPORTANT ON SHELBY SUBSOIL AND NOT ON SURFACE SOIL IN RELATION TO SOIL LOSS. PROLONGING MEADOW IN ROTATION MADE POSSIBLE THE USE OF LESS EXPENSIVE CONSERVATION PRACTICES. STRIP CROPPING AND TERRACING WERE NECESSARY IN ADDITION TO CONTOURING ON CULTIVATED SHELBY SOILS. SOIL LOSS FROM CONTOURING WAS ESTIMATED AT 57 PERCENT OF THAT FROM UP-AND-DOWN HILL OPERATIONS, LOSS FROM ROTATION STRIP CROPPING WAS ESTIMATED AT 25 PERCENT LESS, AND LOSS FROM TERRACING WAS ESTIMATED AT 3 PERCENT LESS. EIGHT REFERENCES.

STALLINGS, J.H.

1953

WIND-EROSION CONTROL.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SURFACE, SCS-TP-115. 28 P.

WIND EROSION IS THE MOST ACTIVE DEPLETER OF SOIL FERTILITY ON THE GREAT PLAINS. SOIL BLOWING IS MOST EVIDENT IN SPRING, AND VARIES INVERSELY WITH THE ROUGHNESS OF THE SURFACE. WIND EROSION CAN BE CONTROLLED BY TERRACES, TILLAGE PRACTICES, WINDBREAKS, AND ESTABLISHING VEGETAL COVER IN AREAS NEEDING RECONDITIONING. INSTRUCTIONS FOR ACHIEVING THESE CONTROLS ARE GIVEN. BEACH SAND PRESENTS SPECIAL PROBLEMS AND MUST BE PLANTED WITH GRASS TO PREVENT EXTENSIVE EROSION. 26 REFERENCES.

STRINGHAM, G.E.

1975

WATER REHABILITATION CULTURAL AND MECHANICAL CONSIDERATIONS. IN J.L. THAMES AND J.N. FISCHER, WATERSHED MANAGEMENT IN ARID ZONES, P. 91-104.

UNIVERSITY OF ARIZONA, SCHOOL OF RENEWABLE NATURAL RESOURCES, TUCSON. 302 P.

REHABILITATION OF AN ERODING WATERSHED BEGINS WITH WATER CONTROL WHICH CAN BE ACHIEVED WITH A GOOD VEGETATIVE COVER, TILLAGE PRACTICES ADAPTED TO PARTICULAR SLOPES, CAREFUL LOCATION OF ACCESS ROADS, TERRACES AND GRASSED WATERWAYS. ONCE THE WATER LEAVES THE WATERSHED AND COLLECTS IN STREAM CHANNELS, IT CAN BE CONTROLLED IN NATURALLY EROSION-RESISTANT CHANNELS OR CHANNELS WITH SPECIALLY CONTRUCTED DROP STRUCTURES, SMALL DAMS, AND RETENTION BASINS. COMBINATIONS OF THESE STRUCTURES AND TILLAGE PRACTICES CAN, IF PROPERLY INSTALLED AND MANAGED, PROVIDE THE NECESSARY WATER CONTROL WHICH WILL PROVIDE FOR THE WATERSHED S REHABILITATION. 9 REFERENCES.

THRONSON, R.E.

1973

COMPARATIVE COSTS OF EROSION AND SEDIMENT CONTROL, CONSTRUCTION ACTIVITIES.

U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF WATER PROGRAM OPERATIONS, WATER QUALITY AND NON-POINT SOURCE DIVISION, 205 P.

COST INFORMATION ON EROSION AND SEDIMENT CONTROL MEASURES WAS DEVELOPED FOR OVER 25 METHODS IN CURRENT WIDESPREAD USE IN BOTH THE HUMID EASTERN AND ARID WESTERN UNITED STATES. MOST OF THE DATA PRESENTED WERE DEVELOPED FOR THE WALNUT CREEK BASIN IN CALIFORNIA AND OCCOQUAN CREEK BASIN IN VIRGINIA, BUT THE DETAILED COST ESTIMATES PRESENTED PROVIDE A BASIS FOR ESTIMATING LOCAL COSTS ELSEWHERE FOR SIMILAR CONTROL METHODS USING THREE PRINCIPAL COST ELEMENTS: LABOR, EQUIPMENT, AND MATERIALS. SOIL LOSSES WERE ESTIMATED BY USING THE IMPROVED UNIVERSAL SOIL LOSS EQUATION. THE RAINFALL INDEX IN THE SOIL LOSS EQUATION WAS INTENSIVELY STUDIED, AND SIMPLIFIED PROCEDURES FOR ITS COMPUTATION WERE PRESENTED. COST DATA WERE APPLIED TO THEORETICALLY-PREDICTED SOIL LOSSES IN BOTH OF THE SELECTED WATERSHEDS TO OBTAIN COMPARATIVE COSTS PER CUBIC YARD OF SOIL RETAINED FOR CONSERVATION MEASURES, AND SIMILAR COSTS FOR VARIOUS SEDIMENT REMOVAL METHODS. CONTROL EFFECTIVENESS PARAMETERS AND ECONOMIC LIFE OF EACH METHOD WERE USED TO DETERMINE COMPARABLE ANNUAL COST FIGURES. A CENTRAL CONCLUSION OF THE STUDY WAS THAT COSTS OF PREVENTING EROSION ARE, IN MANY INSTANCES, LOWER THAN THE DIRECT COSTS OF REMOVING SEDIMENTS FROM DOWNSTREAM AREAS OR FROM WATER SUPPLIES. 140 REFERENCES.

U.S. DEPARTMENT OF AGRICULTURE

1965

PROCEEDINGS OF THE FEDERAL INTER-AGENCY SEDIMENTATION CONFERENCE, 1963.

SAME AS AUTHOR, MISCELLANEOUS PUBLICATION 970. 933 P.

CONTAINS 92 PAPERS WHICH WERE PRESENTED AT THE CONFERENCE IN FOUR SYMPOSIA: 1) LAND EROSION AND CONTROL, 2) SEDIMENT IN STREAMS, 3) SEDIMENTATION IN ESTUARIES, HARBORS, AND COASTAL AREAS, AND 4) SEDIMENTATION IN RESERVOIRS. PAPER TOPICS INCLUDE THE FOLLOWING: EROSION IN AGRICULTURE, LOGGING, HIGHWAY AND URBAN CONSTRUCTION; ROLE OF STORMS, SEASONALITY, AND WATERSHED CHARACTERISTICS IN SEDIMENTATION AND EROSION, MATHEMATICAL MODELS OF SEDIMENT YIELD; SEDIMENT CONTROL METHODS IN STREAMS, COASTAL AREAS, AND RESERVOIRS; AND RESULTS OF SURVEYS AND STUDIES PERTAINING TO SEDIMENTATION. REFERENCES FOLLOW EACH PAPER.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, MORGANTOWN, WEST VIRGINIA.

1975

EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AREAS.

SAME AS AUTHOR, 340 P.

THIS HANDBOOK SEEKS TO INSTRUCT PLANNERS AND BUILDERS IN EROSION CONTROL PRACTICES IN WEST VIRGINIA, IN LIGHT OF SERIOUS LAND DISTURBANCE CAUSED BY BUILDING, RECREATIONAL CONSTRUCTION, MINERAL EXTRACTION, AND FARMING. SOURCES OF ASSISTANCE ARE GIVEN. VEGETATION MEASURES AND STRUCTURAL MEASURES ARE COVERED IN DETAIL. ESTIMATIONS OF SOIL LOSS AND RUNOFF ARE GIVEN. MANY TABLES PRESENTING VEGETATION SUCCESS DATA AND BLUEPRINTS FOR STRUCTURAL CONSTRUCTION ARE INCLUDED. THE MEASURES COVERED IN THIS HANDBOOK ARE APPLICABLE TO MANY URBAN AND SEMI-RURAL AREAS IN THE U.S. A GLOSSARY IS INCLUDED. 0 REFERENCES.

U.S. FOREST SERVICE, SOUTHEASTERN AREA, STATE AND PRIVATE FORESTRY.

1974

Y-LT EROSION CONTROL HANDBOOK.

SAME AS AUTHOR. 55 P.

THIS HANDBOOK IS DIVIDED INTO FIVE CHAPTERS DEALING WITH THE FOLLOWING TOPICS: TREE PLANTING, SITE IMPROVEMENT MEASURES, SITE PROTECTION MEASURES, HYDROLOGIC STAND IMPROVEMENT, AND WILDLIFE COORDINATION. A VARIETY OF PROGRAMS AND TECHNIQUES ARE DESCRIBED. DIAGRAMS AND PHOTOGRAPHS ARE INCLUDED. 0 REFERENCES.

WALDRON, H.H.

1967

DEBRIS FLOW AND EROSION CONTROL PROBLEMS CAUSED BY THE ASH ERUPTIONS OF IRAZU VOLCANO, COSTA RICA.

U.S. GEOLOGICAL SURVEY, BULLETIN 1241-I, 37 P.

IRAZU VOLCANO ERUPTED IN 1963. THE ASH CAUSED WIDESPREAD DAMAGE TO PROPERTY, CROPS, AND LIVESTOCK. MUCH OF THE DAMAGE TO PROPERTY WAS CAUSED BY ACCELERATED EROSION AND REPEATED FLOODS OF WATER, MUD, AND ROCK DEBRIS FROM THE SLOPES OF THE VOLCANO. ALL THE DEBRIS FLOW AND EROSION PROBLEMS RESULTED FROM PROFOUND CHANGES IN THE HYDROLOGIC REGIMEN OF THE STREAMS. THE MANTLE OF ASH NOT ONLY GRADUALLY BURIED AND DESTROYED MUCH OF THE NATURAL VEGETATION, BUT THE SURFACE OF THE ASH MANTLE RAPIDLY AND CONTINUOUSLY FORMED A THIN, COMPACT, IMPERMEABLE CRUST THAT DRASTICALLY REDUCED INFILTRATION OF RAINFALL INTO THE SOIL. EMERGENCY EROSION CONTROL MEASURES DEVELOPED IN 1964 INCLUDED DOWNSTREAM FLOOD CONTROL AND HEADWATER FLOOD AND EROSION CONTROL BY MEANS OF WATERSHED REHABILITATION, SUCH AS DAMS, CONTOUR DITCHING, AND REVEGETATION. 41 REFEREENCES.

WITTMUS, H.D./SWANSON, N.P.

1964

TILL-PLANTED CORN REDUCES SOIL LOSSES.

AGRICULTURAL ENGINEERING 45(5):256.

THE NEBRASKA STUDY REPORTED HERE WAS CONDUCTED TO DETERMINE THE DIFFERENCES IN SOIL LOSSES BETWEEN CONVENTIONAL AND TILL-PLANT METHODS FOR DIFFERENT SIMULATED RAINFALL INTENSITIES AT A TIME WHEN THE WATER EROSION POTENTIAL WAS HIGHEST. AS SERIES OF ARTIFICIAL STORMS WAS APPLIED TO TWO SETS OF PLOTS EACH RECEIVING ONE OF THE FOLLOWING TILLAGE TREATMENTS: 1) TILL-PLANTED, 2) NON-TILLED, AND 3) CONVENTIONALLY TILLED. SOIL LOSSES OF LESS THAN ONE TON PER ACRE PER EROSION PRODUCING STORM MAY BE EXPECTED FROM THE TIME THE CORN PROVIDES A CANOPY COVER UNTIL THE RESIDUE COVER IS AGAIN TILLED THE FOLLOWING SPRING. 0 REFERENCES.

WOODRUFF, N.P. ET AL

1972

HOW TO CONTROL WIND EROSION

U.S. DEPARTMENT OF AGRICULTURE, AGRICULTURAL RESEARCH SERVICE, AGRICULTURAL INFORMATION BULLETIN 354. 22 P.

SOIL CLODDINESS, SOIL ROUGHNESS, WIND AND SOIL MOISTURE, FIELD LENGTH, AND VEGETATIVE COVER ARE FACTORS AFFECTING WIND EROSION. AN EQUATION EXPRESSING THE AVERAGE ANNUAL SOIL LOSS AS A FUNCTION OF THESE FACTORS IS PRESENTED. FIVE PRICIPLES OF EROSION CONTROL ARE: 1) PRODUCE AGGREGATES LARGE ENOUGH TO RESIST THE WIND FORCE, 2) ROUGHEN THE LAND SURFACE TO REDUCE WIND VELOCITY AND TRAP DRIFTING SOILS, 3) REDUCE FIELD WIDTHS ALONG THE PREVAILING WIND DIRECTION BY ESTABLISHING WIND BARRIERS OR TRAP STRIPS AT INTERVALS TO REDUCE WIND VELOCITY AND SOIL AVALANCHING, 4) ESTABLISH AND MAINTAIN VEGETATION OR VEGETATIVE RESIDUES TO PROTECT SOIL, AND 5) LEVEL OR BENCH LAND WHERE ECONOMICALLY FEASIBLE. CONTROL PRACTICES ON VARIOUS TYPES OF LAND, SUCH AS IRRIGATED, PLANTED FIELDS, GRAZING LAND, AND SAND DUNES ARE ELABORATED. 0 REFERENCES.

ZAK, J.M./WAGNER, J.

1967

OIL-BASE MULCHES AND TERRACES AS AIDS TO TREE AND SHRUB ESTABLISHMENT ON COASTAL SAND DUNES.

JOURNAL OF SOIL AND WATER CONSERVATION 22(5):198-201.

PLANTING TREES AND SHRUBS ON ACTIVE NEW ENGLAND COASTAL DUNES PROVED WORTHWHILE WHERE A 300-GALLON-PER-ACRE FUEL OIL MULCH WAS APPLIED FOR PROTECTION. AFTER 2 1/2 YEARS, THE MULCH REMAINED IN GOOD CONDITION, AND THERE WAS NO EROSION. A 150- GALLON-PER-ACRE FUEL OIL MULCH WAS NOT SUFFICIENT TO STILL BLOWING SANDS. HOWEVER, WHERE GRASSES ESTABLISHED THEMSELVES IN BARE SAND, THE SAND WAS STILLED TO SOME EXTENT, AND EROSION WAS REDUCED. BOTH TERRACING AND AN ASPHALT MULCH PROVED TO BE INEFFECTIVE EROSION CONTROL MEASURES. 3 REFERENCES.

VEGETAL EROSION CONTROLS

ALDON, E.F.

1973

REVEGETATING DISTURBED AREAS IN THE SEMIARID SOUTHWEST.

JOURNAL OF SOIL AND WATER CONSERVATION 28(5):223-225.

RESEARCH ON FOURWING SALTBUSH AND ALKALI SACATON HAS PROVED THEM TO BE USEFUL SOIL STABILIZERS IN BADLY ERODED, OVERGRAZED SITES IN THE SEMIARID SOUTHWEST, PRIMARILY IN AREAS WITH ALKALINE SOILS IN LOW RAINFALL ZONES AND ON FLOODPLAINS. PLANT ESTABLISHMENT SHOULD BE CONCENTRATED AT CRITICAL LOCATIONS ON DISTURBED SITES, ESPECIALLY AT THE TOE AND TOP OF SLOPES TO PREVENT RILLING AND GULLYING. BOTH PLANTS ARE WELL ADAPTED TO FLOODPLAINS AND SLOPE TOES BECAUSE THEY CAN WITHSTAND FLOODING AND SEDIMENT DEPOSITION, AND THE WIDE CROWNS OF THE MATURE FOURWING SALTBUSH ALSO PREVENT RAINFALL IMPACT DAMAGE. BOTH PLANTS ALSO PROVIDE FORAGE FOR GRAZING ANIMALS. SEEDING TECHNIQUES FOR ESTABLISHING THESE PLANTS IN DISTURBED AREAS IN THE SOUTHWEST ARE SUMMARIZED. 13 REFERENCES.

ALDON, E.F.

1975

ESTABLISHING ALKALI SACATON ON HARSH SITES IN THE SOUTHWEST.

JOURNAL OF RANGE MANAGEMENT 28(2):129-132.

FIELD POSSIBILITIES OF ESTABLISHING ALKALI SACATON WERE TESTED ON A HARSH SPILLWAY SITE ON THE RIO PUERCO DRAINAGE IN NEW MEXICO. SINCE A STORM OCCURRED ON THE SITE SHORTLY AFTER PLANTING, THE TREATMENTS DIFFERED ONLY IN THE USE OF AGAR, PLANTING IN A DEPRESSION, AND INITIAL SATURATION. SURVIVAL WAS BEST WHERE NO AGAR OR DEPRESSION WAS USED. ESTABLISHMENT REQUIREMENTS FOR ALKALI SACATON ARE EXACTING AND SHOULD INCLUDE: 1) PLANTING WHEN SOIL MOISTURE IS 14 PERCENT OR MORE, 2) SOIL TRMPERATURES SHOULD BE NEAR 30 DEGREES C., 3) USE LARGE SEEDS AT LEAST ONE-YEAR OLD, 4) SATURATE SITE PRIOR TO PLANTING, AND 5) COVER SEEDS WITH MULCH. 4 REFERENCES.

BARNETT, A.P.

1965

USING PERENNIAL GRASSES AND LEGUMES TO CONTROL RUNOFF AND EROSION.

JOURNAL OF SOIL AND WATER CONSERVATION 20(5):212.

A NUMBER OF EXAMPLES OF RUNOFF AND EROSION CONTROL FROM VARIOUS EXPERIMENTS THROUGHOUT THE SOUTHEAST ARE ANALYZED USING THE EROSION INDEX. IT IS CONCLUDED THAT, AFTER THE FIRST YEAR OF ESTABLISHMENT, PERENNIAL COVER CROPS AND SODS PROVIDE PERFECT RUNOFF AND EROSION CONTROL. AN ADEQUATE OVERALL WATER MANAGEMENT PLAN IS NECESSARY, HOWEVER, AS RUNOFF FROM SODS IS HIGH DURING PERIODS OF HEAVY RAINFALL. 15 REFERENCES.

BENGSON, S.A.

1975

DRIP IRRIGATION FOR REVEGETATING STEEP SLOPES IN AN ARID ENVIRONMENT.

PROGRESSIVE AGRICULTURE IN ARIZONA 27(1):3-5, 12.

DRIP IRRIGATION FOR REVEGETATING STEEP SLOPES WAS EXPERIMENTED WITHIN THE SACATON MINE UNIT NEAR CASA GRANDE, ARIZONA, IN AREAS CONSTRUCTED OF ALLUVIAL OVERBURDEN MATERIAL REMOVED FROM THE OPEN PIT MINE. THE SOIL MATERIAL WAS FINE TEXTURED, ALKALINE, AND LIED ON A 2:1 NATURAL ANGLE OF REPOSE. NATIVE SHRUB AND TREE SPECIES ADAPTED TO THE ARID ENVIRONMENT WERE SELECTED FOR REVEGETATING THE UNIT. DRIP IRRIGATION HAD THE ADVANTAGES OF CONSERVING WATER, ALLEVIATING THE HAZARD OF RUNOFF AND SUBSEQUENT EROSION, PERMITTING THE CONTROL OF FERTILIZER APPLICATIONS (INJECTED INTO THE SYSTEM), THE PORTABILITY OF THE SYSTEM, AND ENCOURAGING DEEP DEVELOPMENT OF ROOTS. DISADVANTAGES OF DRIP IRRIGATION INCLUDED COSTS, ACCUMULATION OF SALTS AT THE EDGE OF THE WETTING ZONE, INEFFECTIVE FOR PRODUCING SOLID VEGETATIVE COVER, AND WILDLIFE CAN DESTROY PLASTIC COMPONENTS. THREE REFERENCES.

BENNETT, O.L.

1973

VEGETATION TO HEAL SCARS.

SOIL CONSERVATION SOCIETY OF AMERICA, PROCEEDINGS 28: 249-253.

AREAS FACED WITH SEVERE EROSION AND POLLUTION OF STREAMS BY SILTATION AND ACID DRAINAGE FROM OLD, ABANDONED STRIP-MINED SPOILS CAN BE REVEGETATED IF BASIC GUIDELINES ARE FOLLOWED. INITIAL PLANT COVER SHOULD BE FAST-GROWING GRASSES AND LEGUMES. SPECIES SHOWING PROMISE ON LOW PH STRIP MINE AREAS SHOULD BE USED ALONG WITH BASIC NUTRIENT REQUIREMENTS FOR PLANT GROWTH. MULCHING IS USUALLY NECESSARY TO OVERCOME THE DETRIMENTAL EFFECTS OF LOW MOISTURE AND HIGH TEMPERATURE. REGRADING OF OLD SPOILS MAY BE NECESSARY TO ALLOW USE OF MACHINERY FOR SEEDING AND FERTILIZER APPLICATIONS. 4 REFERENCES.

BHUMBLA, D.R. ET AL

1971

SOIL TECHNOLOGY. IN REVIEW OF SOIL RESEARCH IN INDIA, P. 137-168.

INTERNATIONAL SYMPOSIUM ON SOIL FERTILITY EVALUATION, NEW DELHI.

THIS REVIEW CHAPTER IS DIVIDED INTO THREE PORTIONS: SOIL SALINITY, SOIL ACIDITY, AND SOIL CONSERVATION. INCLUDED IS RESEARCH CONDUCTED ON THE NATURE OF SALT AFFECTED SOILS AND THEIR RECLAMATION (SUCH AS USE OF GREENMANURES, AND LEACHING), EXTENT AND NATURE OF SOIL ACTIVITY, LIME REQUIREMENTS, FACTORS INFLUENCING RUN-OFF AND SOIL EROSION, MECHANICAL MEASURES OF SOIL EROSION CONTROL AND CONTROL OF WIND EROSION. 95 REFERENCES.

BLACK, A.B./SIDDOWAY, F.H.

1971

TALL WHEATGRASS BARRIERS FOR SOIL EROSION CONTROL AND WATER CONSERVATION.

JOURNAL OF SOIL AND WATER CONSERVATION 26(3):107-111.

A PERENNIAL GRASS BARRIER SYSTEM OF CONSERVATION FARMING WAS EVALUATED IN MONTANA FOR SOIL-WATER CONSERVATION AND SOIL EROSION CONTROL. EACH BARRIER CONSISTED OF TWO ROWS OF TALL WHEATGRASS (AGROPYRON ELONGATUM) SEEDED IN 36-INCH ROWS. BARRIERS WERE SPACED 30 OR 60 FEET APART. BY TRAPPING SNOW, THE CONTINUOUS CROP SEQUENCE WITH BARRIERS STORED 86 TO 116 PERCENT AS MUCH WATER AS CROP-FALLOW WITHOUT BARRIERS. AT A HEIGHT OF 12 INCHES, WINDSPEED FROM LEEWARD OF ONE BARRIER TO WINDWARD OF THE NEXT BARRIER INCREASED FROM 17 TO 70 PERCENT OF OPEN FIELD WINDSPEED IN THE 30-FOOT BARRIER SPACING AND FROM 19 TO 84 PERCENT IN THE 60-FOOT INTERVAL. SEVEN REFERENCES.

BORST, H.L./MCCALL, A.G./BELL, F.G.

1945

INVESTIGATIONS IN EROSION CONTROL AND RECLAMATION OF ERODED LAND AT THE NORTHWEST APPALACHIAN CONSERVATION EXPERIMENT STATION, ZANESVILLE, OHIO, 1934-1942.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 888, 95 P.

TOPOGRAPHY IN THIS AREA IS HILLY AND SOILS ARE ACIDIC. OLD STYLE FARMING ON SLOPES CAUSES SERIOUS EROSION. GRASSES AND LEGUMES SHOULD REPLACE ALL OTHER CROPS, AS THEY PROVIDE MAXIMUM RESISTANCE TO EROSION. STRIP CROPPING AND TERRACING REDUCE EROSION. RAINFALL SIMULATION STUDIES WERE DONE TO DETERMINE TYPES OF MULCHING EFFECTIVE FOR EROSION CONTROL. STRAW MULCH PLACED ON AN OPEN SURFACE PROMOTED RAPID INFILTRATION AND CONTROLLED EROSION. SEEDINGS AND PLANTINGS EFFECTIVE FOR EROSION CONTROL ARE DISCUSSED. 35 REFERENCES.

BROWN, G.W.

1962

PIPING EROSION IN COLORADO.

JOURNAL OF SOIL AND WATER CONSERVATION 17(5):220-222.

PHYSICAL AND CHEMICAL SOIL PROPERTIES ASSOCIATED WITH PIPING EROSION ARE DISCUSSED. INCLUDED ARE MEASUREMENTS OF CATION EXCHANGE AND OF CALCIUM, SODIUM, AND MAGNESIUM. CLAY CONTENT AND AGGREGATION ARE EXAMINED. A PIPING FORMATION HYPOTHESIS IS PRESENTED. SUGGESTIONS FOR RESTORATION OF PIPED AREAS AND FOR PIPING CONTROL ARE GIVEN. THESE INCLUDED SLOPING AND THE REESTABLISHMENT OF VEGETATIVE COVER. 23 REFERENCES.

BROWN, R.L.

1948

PERMANENT COASTAL DUNE STABILIZATION WITH GRASSES AND LEGUMES.

JOURNAL OF SOIL AND WATER CONSERVATION 3(2):69-74.

GRASSES AND LEGUMES OF VARIOUS MIXTURES WERE USED TO STABILIZE SAND DUNES IN OREGON. VARIOUS FERTILIZER PREPARATIONS AND APPLICATION RATES WERE UTILIZED. IT WAS FOUND THAT INITIAL PLANTINGS OF BEACHGRASS HAD NOT STABILIZED THE DUNES; FOR STABILIZATION COMPLETE AND PERMANENT VEGETATIVE COVER MUST BE ESTABLISHED. 1 REFERENCE.

COCHRAN, V.L./PAPENDICK, R.I./FANNING, L.D.

1970

EARLY FALL CROP ESTABLISHMENT TO REDUCE WINTER RUNOFF AND EROSION ON PALOUSE SLOPES.

JOURNAL OF SOIL AND WATER CONSERVATION 25(6):231-234.

OVERWINTER RUNOFF AND SOIL EROSION ON FALLOW WAS REDUCED BY EARLY FALL CROP ESTABLISHMENT IN THE WINTER WHEAT REGION OF THE PALOUSE. OVER A 3 YEAR PERIOD, RUNOFF AND SOIL LOSS OCCURRED ONLY WITH OCTOBER (LATE) SEEDINGS. STANDS ESTABLISHED IN SEPTEMBER (EARLY) PROVIDED SUFFICIENT FALL COVER TO REDUCE OR PREVENT WATER AND SOIL LOSSES. SUCCESSFUL EARLY STANDS, MOST YEARS, REQUIRED DEEP-FURROW SEEDING WITH WIDE ROW SPACING IN CONTRAST TO CONVENTIAL DOUBLE-DISK SEEDING IN NARROW ROWS. ALTHOUGH THE FURROW SYSTEM CONCENTRATED RAINWATER, IT ALSO CONCENTRATED PLANT COVER AND ROOT DEVELOPMENT, THEREBY PROTECTING THE LOCAL AREA WHERE RUNOFF WAS LIKELY TO OCCUR. WIDE ROW SPACING DID NOT ADVERSELY EFFECT WHEAT YIELDS. 11 REFERENCES.

COPLEY, T.A. ET AL

1944

INVESTIGATIONS IN EROSION CONTROL AND RECLAMATION OF ERODED LAND AT THE CENTRAL PIEDMONT CONSERVATION EXPERIMENT STATION, STATESVILLE, N.C., 1930-1940.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 873, 66 P.

INVESTIGATIONS INTO THE CAUSES AND CONSEQUENCES OF EROSION AND METHODS FOR ITS CONTROL WERE CONDUCTED ON PLOTS OF VARIOUS SIZES, FIELDS, AND TERRACED AND NATURAL WATERSHEDS. METEOROLOGICAL RECORDS WERE ALSO KEPT. THE CONTROL PLOT STUDIES SHOWED THAT RUNOFF AND SOIL LOSSES WERE DIRECTLY RELATED TO RAINFALL INTENSITY, BUT THE MAGNITUDE OF SOIL LOSS WAS MODIFIED BY SUCH OTHER FACTORS AS SOIL TYPE, SOIL MOISTURE, STATE OF CULTIVATION, DEGREE AND LENGTH OF SLOPE, AND EXTENT OF PROTECTIVE COVER ON THE SLOPE. RUNOFF AND SOIL LOSSES UNDER GOOD VEGETAL COVER COMPOSED OF SOD OR WOODS WERE OF NEGLIGIBLE QUANTITIES. BURNING OF WOODS LITTER INCREASED RUNOFF AND SOIL LOSSES TO SERIOUSLY LARGE QUANTITIES. METHODS AND TYPES OF TERRACING ARE PRESENTED. 7 REFERENCES.

CRADDOCK, G.W./PEARSE, C.K.

1938

SURFACE RUN-OFF AND EROSION ON GRANITIC MOUNTAIN SOILS OF IDAHO AS INFLUENCED BY RANGE COVER, SOIL DISTURBANCE, SLOPE, AND PRECIPITATION INTENSITY.

U.S. DEPARTMENT OF AGRICULTURE, CIRCULAR 482. 24 P.

DURING 1934 AND 1935, FOUR OF THE IMPORTANT HERBACEOUS RANGE COVER TYPES ON A PORTION OF THE BOISE RIVER WATERSHED IN SOUTHWESTERN IDAHO WERE SELECTED FOR STUDY AND THEIR RELATIVE EFFECTIVENESS IN CONTROLLING RUN-OFF AND EROSION UNDER CONDITIONS OF SOIL DISTURBANCE, SLOPE, AND RAINFALL INTENSITY WAS DETERMINED. FOUR RANGE TYPES WERE: 1) WHEATGRASS, 2) DOWNY CHESS, 3) LUPINE-NEEDLE GRASS, AND 4) ANNUAL WEED. A SPECIAL APPARATUS WAS DEVELOPED FOR PRODUCING ARTIFICIAL RAINSTORMS OF THE DESIRED AMOUNT AND INTENSITY AND FOR MEASURING THE RESULTING RUNOFF AND EROSION. EROSION WAS AFFECTED MOSTLY AND ABOUT EQUALLY BY VEGETATIVE TYPE AND STEEPNESS OF SLOPE AND TO A LESSER, THOUGH SIGNIFICANT DEGREE, BY SOIL DISTURBANCE AND RAINFALL INTENSITY. RESULTS INDICATE THAT WHEATGRASS RANGE WAS SUPERIOR OVER OTHER EXISTING RANGE TYPES FOR CONTROLLING RUNOFF AND EROSION. 16 REFERENCES.

CZAPOWSKYJ, M.M./WRITER, R.

1970

HYDROSEEDING ON ANTHRACITE COAL-MINE SPOILS.

U.S. FOREST SERVICE, NORTHEASTERN FOREST EXPERIMENT STATION, UPPER DARBY, PENNSYLVANIA, RESEARCH NOTE NE-124. 8 P.

REVEGETATION QUICKLY AND ON LARGE AREAS OF ANTHRACITE COAL-MINE SPOILS IN PENNSYLVANIA IS DIFFICULT BECAUSE HANDPLANTING IS SLOW AND CONVENTIONAL MACHINES CANNOT NEGOTIATE THE STEEP SLOPES AND ROCKY SPOILS. THIS IS A REPORT OF A NEW METHOD OF DIRECT SEEDING BY MACHINE CALLED HYDROSEEDING. IN 1967 TWO MIXTURES, EACH CONTAINING SEEDS OF A CONIFEROUS AND A HARDWOOD SPECIES, A LEGUME AND A GRASS WERE HYDROSEEDED IN A SLURRY OF LIME, FERTILIZER AND MULCH. PLOT LAYOUT INCLUDED TWO SPOIL MATERIALS EACH WITH TWO GRADING CONDITIONS. AFTER THREE GROWING SEASONS THE PLOTS WERE RATED AS TO NUMBER OF PLANTS, PLANT VIGOR AND GROUND COVER. HYDROSEEDING FAILED ON COAL-BREAKER REFUSE, BUT WAS PARTIALLY SUCCESSFUL ON STRIP-MINE SPOILS. SPOIL CHARACTERISTICS (ESPECIALLY SLOPE, ASPECT AND PHYSICAL MAKEUP) IN ADDITION TO SPECIES SELECTION HAVE TO BE CAREFULLY WEIGHED. 7 REFERENCES.

DANIEL, H.A./ELWELL, H.M./COX, M.B.

1943

INVESTIGATION IN EROSION CONTROL AND RECLAMATION OF ERODED LAND AT THE RED PLAINS CONSERVATION EXPERIMENT STATION, GUTHRIE, OKLAHOMA, 1930-1940.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, TECHNICAL BULLETIN 837, 94 P.

EXPERIMENTS IN METHODS OF EROSION CONTROL WERE CONDUCTED ON PLOTS OF VARIOUS SIZES, INDIVIDUAL TERRACES, AND TERRACED AND NATURAL WATERSHEDS UNDER DIFFERENT CONDITIONS OF VEGETATIVE COVER, CULTIVATION, CROPPING SYSTEM, OR TERRACE DESIGN, AND THE COMPARATIVE EFFECTIVENESS OF THESE CONDITIONS WAS MEASURED BY SOIL AND WATER LOSSES, CROP YIELDS, AND OBSERVATIONS. THE MOST EFFECTIVE METHOD OF CONTROLLING EROSION WAS WITH THICK-GROWING VEGETATION. OF THIS GRASS WAS THE BEST EROSION-RESISTANT COVER. DEGREES OF SOIL LOSS ARE GIVEN FOR GRASS TYPE, TILLAGE PRACTICES, AND CROP VARIETIES. SOIL LOSS ALSO INCREASED WITH GRADE. FERTILIZATION AFFORDED SOME INCREASE IN CROP YIELDS ON ERODED LAND, BUT RETURNS DID NOT JUSTIFY THE FERTILIZER TREATMENT. 25 REFERENCES.

DISEKER, E.G./RICHARDSON, E.C.

1961

ROADSIDE SEDIMENT PRODUCTION AND CONTROL.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 4(1):62-64, 68.

IN 1956 A COMPARATIVE RESEARCH PROJECT WAS SET UP IN GEORGIA TO MEASURE THE SOIL AND WATER LOSSES FROM HIGHWAY CUTS AND TO DETERMINE THE BEST PLANT COVER, FERTILITY REQUIREMENTS, AND CULTURAL PRACTICES FOR QUICK ESTABLISHMENT AND EFFECTIVE MAINTENANCE OF PROTECTIVE VEGETATION. SOIL AND WATER LOSS MEASUREMENTS INDICATED THAT FROST ACTION CONTRIBUTED HEAVILY TO EROSION AND THAT SEASONAL EROSION HAZARD FOR ROADBEDS DID NOT COINCIDE WITH PERIODS OF MAXIMUM HAZARD FROM AGRICULTURAL LAND. OF THE COOL SEASON PERENNIAL GRASSES TESTED, FESCUE, ORCHARD AND OKLAHOMA BROME RANKED IN IMPORTANCE AS LISTED. OF THE PERENNIAL SUMMER GROWING GRASSES, BERMUDA AND WEEPING LOVEGRASS GAVE THE BEST RESULTS. MULCHES WERE ESSENTIAL FOR DEVELOPMENT OF COVER ON THE STEEPER CUTS AND FOR PLANTS WHICH SLOWLY DEVELOPED A COMPLETE COVER. 0 REFERENCES.

DUFFY, P.D./MCCLURKIN, D.C.

1967

STABILIZING GULLY BANKS WITH EXCELSIOR MULCH AND LOBLOLLY PINE.

JOURNAL OF SOIL AND WATER CONSERVATION 22(2):70-71.

A STUDY WAS CONDUCTED IN MISSISSIPPI FROM 1964 TO 1966 ON THE BENEFITS OF EXCELSIOR MULCH IN THE ESTABLISHMENT OF LOBLOLLY PINE FOR EROSION CONTROL. TWENTY MONTHS AFTER PLANTING, SOIL LOSS WAS DOWN 71 PERCENT AND THE EXCELSIOR WAS EXPECTED TO LAST ANOTHER YEAR. WHILE THE SEEDLINGS SURVIVAL WAS DOWN THE FIRST YEAR, IN THE 1965 AND 1966 TESTS SURVIVAL DID NOT DIFFER FROM UNMULCHED PLOTS. THE RELATIVELY HIGH COST OF EXCELSIOR WOULD BE JUSTIFIED ON STEEP OR CRITICALLY ERODED SURFACES WHERE SWIFT AND SURE PROTECTION IS NEEDED. 0 REFERENCES.

DYRNESS, C.T.

1967

GRASS-LEGUME MIXTURES FOR ROADSIDE SOIL STABILIZATION.

U.S. FOREST SERVICE, PACIFIC NORTHWEST STATION, PORTLAND, OREGON, RESEARCH NOTE PNW-71. 19 P.

THIS STUDY INCLUDES BOTH A SEARCH FOR LEGUME SPECIES SUITABLE FOR ROADSIDE PLANTING, AND A FIELD COMPARISON OF THE PERFORMANCE OF SEVERAL GRASS-LEGUME MIXTURES GROWING IN ROADSIDE SLOPE LOCATIONS. IN TESTING IN THE WESTERN CASCADES OF OREGON, BIG TREETOIL (LOTUS CORNICULATUS) AND NEW ZEALAND WHITE CLOVER (TRIFOLIUM REPENS) PROVED SUITABLE FOR PLANTING ON ROADBANKS. WHEN THE GRASS-LEGUME MIXTURES WERE PLANTED FOR THE TEST TREATMENT, RESULTS SHOWED THAT THE LEGUME COMPONENT WAS, IN EVERY CASE, OUTCOMPETED BY THE GRASSES. NEW SPECIES NEED TO BE FOUND. OTHER PRACTICES SUCH AS MULCHING AND FERTILIZATION WERE ADDED, AND PRODUCED LESS SOIL EROSION. PARTICULARLY EFFECTIVE GRASSES WERE RED FESCUE (FESTUCA RUBRA) AND ITALIAN RYE GRASS (LOLIUM MULTIFLORUM). 4 REFERENCES.

DYRNESS, C.T.

1970

STABILIZATION OF NEWLY CONSTRUCTED ROAD BACKSLOPES BY MULCH AND GRASS-LEGUME TREATMENTS.

U.S. FOREST SERVICE, PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION, PORTLAND, OREGON, RESEARCH NOTE PNW-123. 5 P.

FIVE GRASS LEGUME MIXTURES AND A VARIETY OF MULCHES OR LACK OF MULCH WERE APPLIED IN THE FALL TO TWO BLOCKS OF SIX BACKSLOPE PLOTS ESTABLISHED ON A RECENTLY CONSTRUCTED ROAD IN OREGON IN 1967. ALTHOUGH PLANT COVER REMAINED RELATIVELY LOW UNTIL APRIL, TWO MONTHS LATER ALL SEEDED PLOTS WERE VIRTUALLY FULLY PROTECTED. THE ONLY PLOTS TO SHOW CONSISTENTLY LARGE AMOUNTS OF SOIL LOSS WERE THE TWO WITHOUT A STRAW MULCH COVERING. DRY SEASON LOSSES FOR THESE PLOTS WERE ALMOST AS GREAT AS RAIN-CAUSED SOIL LOSS. TWO REFERENCES.

DYRNESS, C.T.

1975

GRASS-LEGUME MIXTURES FOR EROSION CONTROL ALONG FOREST ROADS IN WESTERN OREGON.

JOURNAL OF SOIL AND WATER CONSERVATION 30(4):169-173.

ATTEMPTS WERE MADE TO IDENTIFY LEGUME SPECIES THAT WOULD BE COMPATIBLE WITH GRASSES IN ROADSIDE SEEDING MIXTURES FOR USE IN THE MOUNTAINS OF WESTERN OREGON. DESPITE SUCCESSFUL GERMINATION AND EARLY ESTABLISHMENT, LEGUMES WERE UNABLE TO COMPETE WITH GRASSES AND LARGELY DISAPPEARED FROM MOST ROADSIDE STANDS AFTER 1 YEAR. GRASS-LEGUME SEED, FERTILIZER, AND STRAW MULCH APPLIED TO ROAD BACKSLOPES FOR THE MOST PART SUCCESSFULLY HALTED EROSION. RESULTS INDICATED THAT A MULCH, AS WELL AS SEED AND FERTILIZER, SHOULD BE PLACED ON ROADSIDE SLOPES IF SOIL EROSION IS TO BE MINIMIZED DURING THE FIRST RAINY SEASON FOLLOWING ROAD CONSTRUCTION. 3 REFERENCES.

EDMINSTER, F.C.

1949

STREAMBANK PLANTINGS FOR EROSION CONTROL IN THE NORTHEAST.

U.S. DEPARTMENT OF AGRICULTURE, LEAFLET 258, 8 P.

RESTORING THE PLANT COVER ON STREANBANKS GREATLY HELPS TO IMPROVE THE WATERWAYS. SMALLER STREAMBANKS MAY BE HEALED WITH PLANTING ALONE, BUT LARGER BANKS NEED STONE STRUCTURES IN ADDITION TO PLANTING. SHRUB WILLOW (SALIX PURPUREA) AND DOGWOOD (CORNUS AMOMUM OR C. STOLONIFERA) ARE ADOPTED FOR PLANTING ON ERODED STREAMBANKS. LIVESTOCK NEED TO BE FENCED OUT. METHODS OF PLANTING AND MULCHING ARE GIVEN. 0 REFERENCES.

FLORY, E.L.

1942

REGRASSING FOR SOIL PROTECTION IN THE SOUTHWEST.

U.S. DEPARTMENT OF AGRICULTURE, FARMERS BULLETIN 1913, 60 P.

A PROGRAM FOR THE RECOVERY OF DEPLETED RANGE LANDS IN THE SOUTHWEST SHOULD FIRST CONSIDER NATURAL REVEGETATION. CLIMATIC FACTORS AND EXTENT OF USE WILL DETERMINE IF NATURAL REVEGETATION IS POSSIBLE. ARTIFICIAL REVEGETATION BY RESEEDING IS THE OTHER ALTERNATIVE. THIS REPORT COVERS THE SEARCH FOR SUITABLE SPECIES, GRAZING CONTROL, RODENT CONTROL, SOIL MOISTURE, WEED COMPETITION, AND SEEDING PRACTICES. SPECIES SUITABLE ARE DISCUSSED. THESE INCLUDED WHEATGRASSES (AGROPYRON SP.), GRAMAS (BOUTELOUS SP.), DROPSEEDS (SPUROBOLUS SP.), PANICUMS (PANICUM SP.), RICEGRASS (ORYZOPSIS HYMEN OIDES), HILARIAS (HILARIA SP.), BEARDGRASSES (ANDROPOGON SP.), BRISTLEGRASS (SETARIA MACROSTACHYA), BUSH MUHLY (MUHLENBERGIA PORTERI), AND LOVEGRASS (ERAGROTIS SP.). OTHERS ARE ALSO MENTIONED. 0 REFERENCES.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME

1960

SOIL EROSION BY WIND AND MEASURES FOR ITS CONTROL ON AGRICULTURAL LANDS.

FAO AGRICULTURAL DEVELOPMENT PAPER 71. 88 P.

THE BASIC CAUSE OF SERIOUS WIND EROSION IS THE DEPLETION OR DESTRUCTION OF THE VEGETATIVE COVER BY MAN OR NATURAL EVENTS. THE MOST SERIOUS CONSEQUENCE OF THIS EROSION IS THE CONTINUED REMOVAL OF FINER SOIL FRACTIONS RESULTING IN DECREASED PRODUCTIVITY AND INCREASED EROSIVENESS. IF NOT STABILIZED WITH VEGETATION, THE AREA MAY REVERT TO ACTIVE DUNE FORMATION OR RESULT IN DISCOMFORT OR PHYSICAL INJURY TO MEN AND LIVESTOCK AND DAMAGE TO CROPS AND CAPITAL IMPROVEMENTS. SANDY SOILS AND GRANULAR CLAYS ARE MOST SUSCEPTIBLE TO WIND EROSION. THE FOUR PRINCIPLES OF EROSION CONTROL ARE TO 1) BRING AGGREGATES TO THE SURFACE CAPABLE OF RESISTING WIND ACTION, 2) ROUGHEN THE LAND SURFACE, 3) ESTABLISH WIND BARRIERS, AND 4) ESTABLISH VEGETATION. GENERAL RECOMMENDATIONS INCLUDE MAINTAINING CROP RESIDUE WHEN NOT GROWING CROPS, AVOIDING EXCESSIVE GRAZING, UTILIZING EQUIPMENT WHICH PRESERVES VEGETATIVE RESIDUE AND LEAVES SURFACE SLODDY AND ROUGH, AND AVOIDING CULTIVATION OF LANDS WHERE RAINFALL OR SOIL CONDITION CAUSES FREQUENT CROP FAILURE. 152 REFERENCES.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS.

1968

FAO STUDY TOUR ON SHELTERBELTS AND WINDBREAKS IN THE U.S.S.R.--PART II.

SAME AS AUTHOR, 88 P.

EXAMINES THE HISTORY AND CURRENT STATUS OF PROTECTIVE PLANTATIONS IN THE SOVIET UNION. THE INFLUENCES OF PROTECTIVE PLANTATIONS ON MICROCLIMATE, HYDROLOGIC CONDITIONS, CROPS, AND SOIL CONSERVATION ARE COVERED. EMPHASIS IS ON THE ESTABLISHMENT AND MANAGEMENT OF THESE PLANTATIONS. THE ECONOMIC EFFICIENCY OF SHELTERBELT ESTABLISHMENT IS COVERED IN DETAIL. TREE SPECIES RECOMMENDED ARE : PINE (PINUS), LARCH (LARIX), POPLAR (POPULUS), FALSE ACACIA (ROBINIA PSEUDOACACIA), ASH (FRAXINUS), MAPLE (ACER), ELM (ULMUS), AND BIRCH (BETULA). 0 REFERENCES.

GALLUP, R.M.

1974

ROADSIDE SLOPE VEGETATION, PAST AND CURRENT PRACTICE ON THE NATIONAL FORESTS.

U.S. FOREST SERVICE, EQUIPMENT DEVELOPMENT CENTER, SAN DIMAS, CALIFORNIA. EQUIPMENT DEVELOPMENT AND TEST REPORT 7700-8. 37 P.

EFFECTIVE REVEGETATION IS A PRIMARY METHOD OF PROTECTING ROADSIDE SLOPES FROM EROSION. INFORMATION ON CURRENT PRACTICES AND EQUIPMENT USE WAS GATHERED FROM 25 NATIONAL FORESTS AND FROM OTHER SOURCES. IN SEEDBED PREPARATION, SEEDING, FERTILIZING, MULCHING, ETC., A VARIETY OF METHODS AND EQUIPMENT IS USED, DEPENDING PRIMARILY ON CONDITIONS IN SPECIFIC LOCATIONS. A REVIEW OF EARLIER AND CURRENT LITERATURE SUGGESTIONS FOR POSSIBLE IMPROVEMENTS FOR SCARIFICATION, PLANTING, AND SEEDING OF STEEP SLOPES IS SKETCHED. 25 REFERENCES.

GRAETZ, K.R.

1966

SERICEA FOR EROSION PROTECTION AND BEAUTY ALONG HIGHWAYS.

JOURNAL OF SOIL AND WATER CONSERVATION 21(3):92-94.

TWO PLOTS OF SERICEA WERE PLANTED ON A NORTH CAROLINA ROADBANK IN 1960. CLEAR UNSCARIFIED SEED WAS PLANTED IN ONE PLOT AND UNHULLED SEED IN THE OTHER. BOTH WERE BROADCAST, RAKED, AND MULCHED WITH STRAW. REMOVAL OF THE SEED HULL INDUCED QUICKER GERMINATION IN A CERTAIN PERCENTAGE OF SEED, AND A GREATER NUMBER OF SEEDLINGS EMERGED AFTER THE FIRST RAIN IN THE PLOT WHERE CLEAN UNSCARIFIED SEED HAD BEEN PLANTED. MOST OF THESE SEEDLINGS WERE LOST IN THE WINTER BUT A GREAT NUMBER OF NEW SEEDLINGS EMERGED IN THE SPRING IN BOTH PLOTS. THE TEST IDICATED IT IS BEST TO USE UNHULLED SEED FOR LATE SUMMER PLANTINGS UNTIL THE WEATHER BECOMES COLD ENOUGH TO PREVENT GERMINATION. MULCHING, FERTILIZING, MAINTENANCE, AND THE USE OF SERICEA MIXTURES ARE ALSO CONSIDERED. 0 REFERENCES.

HAMILTON, R.E.

1973

EFFECTIVE USE OF NITROGEN TO ESTABLISH VEGETATION ON SUBSOIL.

SOIL CONSERVATION SOCIETY OF AMERICA, PROCEEDINGS 28: 247-248.

PROBLEMS IN ESTABLISHING VEGTATION ON THE CUT SLOPES OF EMERGENCY SPILLWAYS IN THE LITTLE RACCOON WATERSHED IN INDIANA PROMPTED A FIELD TRIAL TO DETERMINE IF LACK OF FERTILITY WAS THE CAUSE. TWO WEEKS AFTER FERTILIZER TREATMENT USING AMMONIUM NITRATE ON FOUR PLOTS AND 12-12-12 FERTILIZER ON THREE PLOTS, A GREENING EFFECT WAS NOTED. TREATMENT WITH AMMONIUM NITRATE AT ALL RATES WAS VERY IMPRESSIVE AND HIGHER RATES OF ACTUAL NITROGEM GAVE PROGRESSIVELY GREATER RESPONSE. IT APPEARS THAT THE LIMITING ELEMENT TO PLANT GROWTH WAS NITROGEN IN THE NITRATE FORM. ANY CRITICAL AREA, SUCH AS A ROADBANK, WHERE TOPSOIL IS NOT PRESENT, SHOULD BENEFIT FROM A NITRATE SOURCE OF NITROGEN USED AT SEEDING TIME AND/OR FOLLOWING SEEDING. 0 REFERENCES.

HARPAZ, Y./SHANAN, L./TADMOR, N.H.

1965

EFFECTS OF A SYNTHETIC RUBBER CRUST MULCH ON THE EMERGENCE AND EARLY GROWTH OF THREE GRASSES ON SAND DUNES.

ISRAEL JOURNAL OF AGRICULTURAL RESEARCH 15(3):149-153.

THREE GRASSES WERE GROWN ON SAND DUNES, AND THE SURFACES WERE SPRAYED WITH A SYNTHETIC RUBBER PRE-EMERGENCE SPRAY TO FORM A TEMPORARY MULCH TO AID PLANT ESTABLISHMENT. THE CRUST WAS SUFFICIENTLY DURABLE FOR TEMPORARY SAND DUNE STABILIZATION, AND HAD NO EFFECT ON THE EMERGENCE OR GROWTH RATE OF THE PLANTS. 9 REFERENCES.

HEEDE, B.H.

1968

CONVERSION OF GULLIES TO VEGETATION LINED WATERWAYS ON MOUNTAIN SLOPES.

U.S. FOREST SERVICE, ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION, FT. COLLINS, COLORADO, RESEARCH PAPER RM-40. 11 P.

WATERWAYS WERE CONSTRUCTED AND PLANTED TO GRASS IN FOUR GULLIES IN COLORADO. THREE YEARS LATER THEY HAD LOST ONLY 9 PERCENT AS MUCH SOIL AS COMPARABLE UNTREATED GULLIES. CAREFUL ENGINEERING SURVEY AND DESIGN, CLOSE CONSTRUCTION SUPERVISION, AND GOOD RESPONSE TO VEGETATION WERE RESPONSIBLE FOR SUCCESS. LIMITS OF APPLICABILITY COULD NOT BE ESTABLISHED. SEVEN REFERENCES.

HEEDE, B.H.

1975

SUBMERGED BURLAP STRIPS AIDED REHABILITATION OF DISTURBED SEMIARID SITES IN COLORADO AND NEW MEXICO.

U.S. FOREST SERVICE, ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION, FT. COLLINS, COLORADO, RESEARCH NOTE RM-302. 8 P.

TWO PLANTING SITES WITH NARROW SUBMERGED BURLAP STRIPS SHOWED 14 TIMES LESS SOIL LOSS THAN CONTROL SITES WITHOUT BURLAP. GULLIES AND DEEP RILLS NEED TO BE RESHAPED TO GENTLE SWALES BEFORE BURLAP IS INSTALLED. PLANT COVER SHOULD BECOME ESTABLISHED BEFORE BURLAP DISINTEGRATES--ABOUT 5 YEARS. DESIGN CRITERIA AND PHOTOGRAPHS ARE INCLUDED. 2 REFERENCES.

HYDER, D.N.

1969

MICRORIDGE ROLLER HOLDS EROSIVE, SANDY SOILS FOR SEEDING.

CROPS AND SOILS 21(4):20.

IN THREE YEARS OF TESTING IN THE GREAT PLAINS, MICRORIDGE ROLLERS PROVED EFFECTIVE IN INCREASING THE ROUGHNESS AND FIRMNESS OF SOIL ENOUGH TO REDUCE THE EROSIVE WIND FORCE TO ONE-SIXTEENTH. ALTHOUGH RESEARCH WAS DIRECTED LARGELY TO EQUIPMENT DESIGN, SOIL PHYSICAL CONDITIONS, AND WIND EROSION, A FEW SEEDING TRIALS WERE COMPLETED. THE SEEDINGS OF CRESTED WHEATGRASS PROVED EFFECTIVE BUT BLUE GRAMA SEEDLINGS DIED AT SIX WEEKS AS THE MODAL ROOTS WERE UNABLE TO REACH MOIST SOIL. EQUIPMENT AND PLANTING PROCEDURES WERE BEING MODIFIED TO IMPROVE EMERGENCE AND ESTABLISHMENT OF SEEDED GRASSES. 0 REFERENCES.

KLOCK, G.O./TIEDEMANN, A.R./LOPUSHINSKY, W.

1975

SEEDING RECOMMENDATIONS FOR DISTURBED MOUNTAIN SLOPES IN NORTH CENTRAL WASHINGTON.

U.S. FOREST SERVICE, PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION, CORVALLIS, OREGON, RESEARCH NOTE PNW-244. 8 P.

MANY NATIVE AND INTRODUCED PLANT SPECIES WERE TESTED FOR THEIR ABILITY TO BECOME ESTABLISHED ON HIGHLY DISTURBED SOILS ON UPPER ELEVATION SLOPES IN NORTH CENTRAL WASHINGTON. LATAR ORCHARDGRASS, DRUMMOND TIMOTHY, PERENNIAL RYEGRASS, MANCHAR SMOOTH BROME, AND TALL FESCUE PROVED TO BE THE BEST ADAPTED SPECIES. LEVEL OF SUCCESS WITH MOST SPECIES DECREASED WITH INCREASING ELEVATION. RESULTS SHOW THAT FIRELINES WITH SEVERELY DISTURBED SOIL CAN BE SUCCESSFULLY REVEGETATED BY ARTIFICIAL SEEDING. A STARTER FERTILIZER TREATMENT IS IMPERATIVE. COVERING THE SEED BY METHODS SUCH AS WITH A SEED DRILL, OR HARROWING AND USING MULCHES, PARTICULARLY AT HIGHER ELEVATIONS, CAN BE EXPECTED TO INCREASE THE LEVEL OF SUCCESS. 0 REFERENCES.

KOZMENKO, A.S./BRAUDE, I.D.

1966

SILVICULTURAL MEASURES AGAINST SOIL EROSION. IN E.G. KOREISHO AND D.N. MOROZOV, EDS., MANUAL OF AFFORESTATION AND SOIL MELIORATION, P. 81-136.

ISRAEL PROGRAM FOR SCIENTIFIC TRANSLATIONS, JERUSALEM, 2ND EDITION, 364 P. AVAILABLE NTIS AS TT 66-51100.

EROSIONAL PHENOMENA ARE DISCUSSED GENERALLY, INCLUDING THE HYDROGRAPHIC NETWORK, PRESENT DAY EROSION IN THE USSR AND A METHOD FOR DETERMINING THE INCREMENTS OF EROSION. PLANTATIONS WITHIN THE HYDROGRAPHIC NETWORK SHOULD PROVIDE SHADE AND MOISTURE FOR BARE SLOPES, REFORESTATION ON STEEP ERODED SLOPES, PROVIDE MOISTURE IN MEADOWS AND ORCHARD PLANTATIONS IN PARTS OF THE AREA, AND PREVENT BANK EROSION THROUGH REFORESTATION. METHODOLOGY AND SOME AUXILIARY TECHNICAL MEASURES ARE INCLUDED. EROSION CONTROL IN MOUNTAIN REGIONS IS DESCRIBED WITH A LIST OF APPROPRIATE ARBOREAL AND SHRUBBY SPECIES. FORESTS ARE USED TO CONSOLIDATE STONY TALUS AND AS AVALANCHE PROTECTION, AND VEGETATION IS USED TO IMPROVE THE BANKS AND BEDS OF MUDFLOWS. 0 REFERENCES.

MARSTON, R.B.

1952

GROUND COVER REQUIREMENTS FOR SUMMER STORM RUNOFF CONTROL ON ASPEN SITES IN NORTHERN UTAH.

JOURNAL OF FORESTRY 50(4):303-307.

THE EFFECTS OF DIFFERENT AMOUNTS OF PLANT AND LITTER COVER ON OVERLAND FLOW AND EROSION WERE STUDIED OVER A THIRTEEN YEAR PERIOD IN TREATED AND NONTREATED FLOOD-SOURCE AND NONFLOOD-SOURCE PLOTS IN NORTHERN UTAH TO DETERMINE THE AMOUNT OF GROUND COVER NECESSARY FOR WATERSHED PROTECTION. THE BEHAVIOR OF THE FLOOD SOURCE PLOTS DEMONSTRATES THAT SERIOUSLY DEPLETED SITES WILL CONTINUE TO PRODUCE SUBSTANTIAL AMOUNTS OF STORM RUNOFF AND WILL ERODE UNLESS TREATED. IMPROVEMENT OF THESE SITES WILL BE MOST RAPID WHEN THERE IS SURROUNDING ASPEN OR OTHER PERENNIAL VEGETATION TO ENCROACH UPON THE DEPLETED AREAS. SEEDING AND MULCHING CAN ALSO PROVIDE SOIL STABILITY AND SUMMER STORM RUNOFF. CONTOUR TRENCHING MAY BE NECESSARY TO REVEGETATION IN GULLIED DEPLETED AREAS. THE BEHAVIOR OF THE NON-FLOOD-SOURCE PLOTS INDICATES THAT THESE AREAS WITH STABLE SOILS CAN BE CONVERTED TO STORM RUNOFF AND SEDIMENT SOURCE AREAS BY REMOVAL OF THE VEGETAL AND LITTER COVER. A GROUND COVER OF AT LEAST 65 PERCENT APPEARS TO BE A SOUND MINIMUM REQUIREMENT IN CONTROLLING STORM RUNOFF AND EROSION IN HUMID MOUNTAINOUS LANDS. SIX REFERENCES.

MCCLURKIN, D.C.

1971

CONTAINERIZED PINES FOR ERODED WATERSHEDS.

JOURNAL OF SOIL AND WATER CONSERVATION 26(1):25-26.

CURRENT TREE-PLANTING EROSION CONTROL IN THE SOUTHERN COASTAL PLAIN DEPENDS ON NURSERY PRACTICES, LIMITING THE PLANTING SEASON FROM DECEMBER TO MAY. CONTAINERIZED PLANTING APPEARS TO BE A SOLUTION TO THE PROBLEM. THE THREE TYPES OF CONTAINERS BEING TESTED WITH LOBLOLLY PINE SEEDLINGS ARE POLYPROPYLENE TUBING, PEAT PELLETS, AND POLYSTYRENE BULLETS. THE RESULTS HAVE BEEN ERRATIC ALTHOUGH SEEDLINGS IN PELLETS HAVE SHOWN A CONSISTENTLY HIGHER SURVIVAL RATE PERHAPS DUE TO ADDED FERTILIZER. THE PLASTIC BULLETS APPEAR TO BE MOST ADAPTABLE TO EFFICIENT NURSERY PRODUCTION AND MECHANIZED PLANTING. FOUR REFERENCES.

MCWILLIAMS, J.L./VAN CLEAVE, P.E.

1960

A COMPARISON OF CRESTED WHEATGRASS AND NATIVE GRASS MIXTURES SEEDED ON RANGELAND IN EASTERN MONTANA.

JOURNAL OF RANGE MANAGEMENT 13(2):91-94.

IN 1940 PLANTINGS OF CRESTED WHEATGRASS AND MIXTURES OF NATIVE SPECIES WERE MADE ON FORMERLY CULTIVATED LAND IN MONTANA. GREEN NEEDLEGRASS AND WESTERN WHEATGRASS WERE THE DOMINANT NATIVE SPECIES. THE PLANTINGS WERE GRAZED FROM 1942, AND A STUDY IN 1957 INDICATED THAT HERBAGE YIELD OF THE NATIVE MIXTURE WAS 36 TO 58 PERCENT BETTER, DEPENDING ON GRAZING SEASONS; THE NATIVE MIXTURE CONTROLLED EROSION BETTER; CONTINUOUS GRAZING FROM APRIL TO DECEMBER CAUSED AN INCREASE IN NEEDLE-AND-THREAD GRASS AND A REDUCTION IN THE VIGOR AND YIELD OF CRESTED WHEATGRASS; AND UNDER SPRING AND WINTER GRAZING GREEN NEEDLEGRASS INCREASED AND ENCROACHED ON ADJOURNING CRESTED WHEATGRASS STRIPS. THREE REFERENCES.

MECH, S.J.

1962

WIND EROSION CONTROL ON IRRIGATED LANDS.

U.S. DEPARTMENT OF AGRICULTURE, LEAFLET 506, 8 P.

IRRIGATION WILL NOT PREVENT WIND EROSION. LIVE VEGETATION OR VEGETATIVE RESIDUE PROVIDES THE BEST PROTECTION AGAINST WIND EROSION. THE ESTABLISHMENT OF NEW FIELDS SHOULD INCLUDE SOIL STABILIZATION, DELAY OF PLOWING WHEN WINDY, USE STUBBLE AS VEGETATIVE COVER TO PROTECT SEEDLINGS, EROSION-RESISTANT STRIPS, RIDGE PLANTED ROW CROPS, AND CLODDY SEEDBEDS. MULCHING AND THE PROVISION OF WINTER COVER ARE ALSO NECESSARY. 0 REFERENCES.

MEGAHAN, W.E.

1974

DEEP-ROOTED PLANTS FOR EROSION CONTROL ON GRANITIC ROAD FILLS IN THE IDAHO BATHOLITH.

U.S. FOREST SERVICE, INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION, OGDEN, UTAH, RESEARCH PAPER INT-161. 18 P.

NUMEROUS STUDIES SUGGEST THAT PONDEROSA PINE SHOULD REDUCE MASS EROSION HAZARDS ON ROAD FILL SLOPES. A STUDY, DESIGNED WITH 3 REPLICATIONS OF 10 TREATMENTS ON 1/200-ACRE STUDY PLOTS, WAS CONDUCTED TO EVALUATE HOW WELL PONDEROSA PINE SURVIVES, GROWS, AND REDUCES SURFACE EROSION ON GRANITIC ROAD FILLS IN THE IDAHO BATHOLITH. TREE SURVIVAL AVERAGED ABOUT 97 PERCENT AFTER FOUR GROWING SEASONS. FERTILIZER INCREASED PLANTED TREE GROWTH AN AVERAGE OF 95 PERCENT DURING THE YEAR OF PEAK EFFECT. TREE PLANTING, COUPLED WITH STRAW MULCH AND EROSION NETTING, REDUCED EROSION AN AVERAGE OF ABOUT 95 PERCENT RANGING FROM 32 TO 51 PERCENT. PLANTING PONDEROSA PINE AT A SPACING OF 3 BY 3 TO 4 BY 4 FEET IS RECOMMENDED AS AN EROSION-CONTROL MEASURE FOR GRANITIC ROAD FILLS IN THE IDAHO BATHOLITH. 22 REFERENCES.

NOBLE, M.E.

1969

EROSION PROBLEMS AND CONTROL PRACTICES ON FEDERAL DOMAIN LANDS.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, TRANSACTIONS 12(1):71-74.

EARLY DEVELOPMENT OF UNITED STATES LAND LAW AND POLICY STRESSED DISPOSITION OF PUBLIC DOMAIN LANDS AS AN INCENTIVE TO BUILD THE NATIONAL ECONOMIC ESTATE. FEDERAL MANAGEMENT OF THE PUBLIC DOMAIN WAS PROVIDED BY CONGRESS IN 1934 NEAR THE END OF A SEVERE DROUGHT CYCLE WHEN LIVESTOCK HERDS ON OPEN RANGES HAD DEPLETED CONSIDERABLY. AS DEPLETION OF THE VEGETATIVE COVER TOOK PLACE, THE RATE OF EROSION WAS ACCELERATED. LONG-TIME OBJECTIVES OF THE BUREAU OF LAND MANAGEMENT (BLM) SOIL AND WATERSHED CONSERVATION PROGRAM ARE PRESENTED AS WELL AS CONTROL PRACTICES. TREATMENTS FOR THE PURPOSE OF CONVERTING VEGETATION TO BETTER PLANT COVER AND INCREASING INFILTRATION ON BLM LANDS ARE: MECHANICAL AND CHEMICAL BRUSH CONTROL, PINYON-JUNIPER CHAINING, HERBACIOUS WEED CONTROL, SEEDING, CONTOUR FURROWING AND TRENCHING, SOIL PITTING, SOIL RIPPING OR DEEP TILLAGE, AND SMALL CHECK DAMS. 0 REFERENCES.

ORR, H.K.

1975

MINE SPOIL RECLAMATION RESEARCH AT THE BELLE AYR MINE, NORTHEAST WYOMING. IN PROCEEDINGS OF THE FORT UNION COAL FIELD SYMPOSIUM, VOLUME 3: RECLAMATION SECTION, P. 304-307.

MONTANA ACADEMY OF SCIENCE, BILLINGS.

THE MOST APPARENT LIMITING FACTOR IN REGARD TO THE REVEGETATION RESEARCH AT BELLE AYR HAS BEEN TOO LITTLE MOISTURE. STRESS CONDITIONS ARE HIGH. RISK OF FAILURE IN ANY GIVEN YEAR IS HIGH ENOUGH TO WARRANT ADDITIONAL EFFORT AND EXPENSE. RESEARCH APPROACHES IN PLANNING STAGES INCLUDE TRICKLE IRRIGATION, CONTAINERIZED PLANTING STOCK, AND MEASURES TO CONSERVE MOISTURE SUCH AS CROSS-WIND FURROWING AND MULCHING. THESE METHODS ARE EXPECTED TO CONTROL EROSION AND THE MOVEMENT OF SEDIMENT FROM MINE SPOIL AREAS. 2 REFERENCES.

PLASS, W.T.

1973

CHEMICAL SOIL STABILIZERS FOR SURFACE MINE RECLAMATION. IN SOIL EROSION: CAUSES AND MECHANISMS, PREVENTION AND CONTROL, P. 118-122.

NATIONAL RESEARCH COUNCIL, HIGHWAY RESEARCH BOARD, SPECIAL REPORT 135.

SUCCESSFUL STABILIZATION OF SURFACE MINE SPOILS AND OTHER DRASTICALLY DISTURBED AREAS DEPENDS ON THE ESTABLISHMENT OF A GRASS AND LEGUME COVER. MULCHES AND SOIL STABILIZERS MAY BE USED ON THESE SITES TO HELP ESTABLISH VEGETATION AND REDUCE EROSION. THE SELECTION OF AN APPROPRIATE MULCH OR SOIL STABILIZER IS COMPLICATED BY THE NUMBER OF PRODUCTS THAT ARE COMMERCIALLY AVAILABLE AND BY THE SCARCITY OF INFORMATION ON THEIR EFFECTIVENESS. TWO COOPERATIVE DEMONSTRATIONS COMPARED VEGETATION ESTABLISHMENT AND EROSION LOSS FOLLOWING 30 TREATMENTS WITH SIX MULCHES AND 12 SOIL STABILIZERS. THERE IS NO EVIDENCE THAT THESE MATERIALS ARE NECESSARY FOR VEGETATION ESTABLISHMENT; THEY ARE USED PRIMARILY TO CONTROL EROSION. MULCH, SOIL STABILIZER, AND SOIL STABILIZER-MULCH TREATMENTS WERE EFFECTIVE. 0 REFERENCES.

SIDDOWAY, F.H./FORD, R.H.

1971

SEEDBED PREPARATION AND SEEDING METHODS TO ESTABLISH GRASSED WATERWAYS.

JOURNAL OF SOIL AND WATER CONSERVATION 26(2):73-76. SWRA W72-13914.

A STUDY WAS CONDUCTED ON TWO GRASSED WATERWAYS, ONE SEEDED IN EARLY SPRING AND THE OTHER IN LATE FALL WITH A 1:1 MIXTURE OF SMOOTH BROMEGRASS AND WESTERN WHEATGRASS. VARIOUS MULCHES, FERTILIZATION, METHODS OF SEEDBED PREPARATION AND SEEDING METHODS WERE COMPARED. FERTILIZATION SHORTENED THE PERIOD REQUIRED FOR STABILIZATION BY INCREASING THE RATE OF GRASS AND WEED GROWTH. WHEAT STRAW MULCH PROTECTED THE FALL-SEEDED WATERWAY AGAINST HEAVY SNOWMELT RUNOFF IN THE SPRING OF THE ESTABLISHMENT YEAR. TWO REFERENCES.

SINDELAR, B.W.

1973

DRYLAND SODDING WITH NATIVE GRASSES FOR PERMANENT EROSION CONTROL.

MONTANA AGRICULTURAL EXPERIMENT STATION, BOZEMAN, RESEARCH REPORT 43. 22 P.

THE TECHNIQUE, TERMED DRY LAND SODDING AND TESTED BY THE MONTANA AGRICULTURAL EXPERIMENT STATION, INVOLVES THE USE OF NATIVE RHIZOMATOUS GRASSES WHICH ARE SODDED WITHOUT THE ARTIFICIAL APPLICATION OF WATER DURING OR FOLLOWING THE SODDING PROCEDURE. KENTUCKY BLUEGRASS AND INLAND SALTGRASS WERE SODDED IN THE FALL OF 1971 AND THE SPRING OF 1972 IN TWO THICKNESSES, 1 1/2 AND 3 INCHES. WESTERN WHEATGRASS WAS SODDED IN THE SPRING OF 1972 IN A 3 INCH THICKNESS. THE SODDING SITE RECEIVED AN ANNUAL PRECIPITATION OF 12 INCHES. DURING A YEAR OF BELOW NORMAL PRECIPITATION, ALL TREATMENTS PROVIDED EXCELLENT EROSION CONTROL DESPITE SEVERAL HEAVY THUNDERSHOWERS. OF THE THREE NATIVE GRASSES SODDED, INLAND SALTGRASS DID NOT PROVIDE ADEQUATE COVER. KENTUCKY BLUEGRASS WAS RATED AS THE BEST PERFORMER BASED ON ROOT PRODUCTION AND GROUND COVER. FALL DRYLAND SODDING RESULTED IN GREATER ROOT PRODUCTION AND GROUND COVER THAN SPRING SODDING BUT EROSION CONTROL EFFECTIVENESS APPEARED EQUAL IN BOTH TREATMENTS. ONE REFERENCE.

SMITH, W.L. ET AL

1964

SAVE YOUR SOIL WITH CONSERVATION COVERS.

CROPS AND SOILS 16(6):11-14.

PRESENTS SEVERAL METHODS OF EROSION CONTROL ON FARMLAND. GRASSES ARE USED FOR ABOVE-WATER SLOPES IN WATERSHEDS. BERMUDA-GRASS IS SUGGESTED FOR BELOW-WATER SLOPES. METHODS OF PLANTING AND PREPARATION ARE GIVEN. LEGUMES ARE SUGGESTED FOR CONSTRUCTION SCARS SUCH AS ROADBANKS. FERTILIZER SUGGESTIONS ARE PRESENTED. THE RESEARCH WAS DONE IN TEXAS, GEORGIA, AND ILLINOIS. ALTERNATIVE METHODS INCLUDE MATS, LINERS, AND MULCHES FOR WATERWAYS AND GULLIES. 0 REFERENCES.

STALLINGS, J.H.

1953

CONTINOUS PLANT COVER- THE KEY TO SOIL AND WATER CONSERVATION.

JOURNAL OF SOIL AND WATER CONSERVATION 8(1):37-43 AND 8(2):63-68.

EXPLAINS FUNCTIONS OF PLANT COVER IN PREVENTING EROSION, CONCENTRATING ON RAINDROP ENERGY INTERCEPTION, TYPES OF SOIL , COMPARISONS OF RUNOFF UNDER DIFFERENT CONDITIONS, NUTRIENTS RETAINED, EFFECT ON SOIL AGGREGATION, EFFECT ON INFILTRATION, AND EFFECTS OF FERTILIZERS ON PLANT COVER. BY MAINTAINING A CONTINUOUS SUPPLY OF EASILY DECOMPOSABLE ORGANIC MATTER ON THE SOIL SURFACE, PLANT COVER PRODUCES AND MAINTAINS GOOD SOIL TILTH. 45 REFERENCES.

STALLINGS, J.H.

1953

WIND-EROSION CONTROL.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SURFACE, SCS-TP-115. 28 P.

WIND EROSION IS THE MOST ACTIVE DEPLETER OF SOIL FERTILITY ON THE GREAT PLAINS. SOIL BLOWING IS MOST EVIDENT IN SPRING, AND VARIES INVERSELY WITH THE ROUGHNESS OF THE SURFACE. WIND EROSION CAN BE CONTROLLED BY TERRACES, TILLAGE PRACTICES, WINDBREAKS, AND ESTABLISHING VEGETAL COVER IN AREAS NEEDING RECONDITIONING. INSTRUCTIONS FOR ACHIEVING THESE CONTROLS ARE GIVEN. BEACH SAND PRESENTS SPECIAL PROBLEMS AND MUST BE PLANTED WITH GRASS TO PREVENT EXTENSIVE EROSION. 26 REFERENCES.

TAUBE, C.M.

1967

STABILIZATION OF AN ERODED RIVER BANK.

JOURNAL OF SOIL AND WATER CONSERVATION 22(6):249-250.

A SERIES OF PHOTOGRAPHS COVERING 30 YEARS ILLUSTRATES THE PROGRESS OF PLANT INVASION AND GROWTH ON A HIGH RIVER BANK IN MICHIGAN. A CURRENT DEFLECTION INSTALLED IN THE MID 1930 S HAD APPARENTLY ENCOURAGED STABILIZATION BY PROTECTING THE SLOPE FROM UNDERCUTTING. WHILE NOT MAINTAINED, IT WAS APPARENTLY STILL EFFECTIVE TO AN EXTENT IN 1966. VEGETATION GRADUALLY INCREASED FROM 1939, AND BY 1969 MUCH OF THE BANK WAS COVERED, ALTHOUGH BY 1966 A STRIP OF BANK HAD BEEN DENUDED BY PUBLIC USE FOR RIVER ACCESS. STABILIZATION COULD NO DOUBT HAVE BEEN HASTENED BY PROVIDING A DEFLECTOR UPSTREAM, RIPRAPPING THE BASE OF THE INCLINE WITH ROCK, PLANTING VEGETATION, AND PROTECTING THE BANK FROM FOOT TRAFFIC. 0 REFERENCES.

TIEDEMANN, A.R./KLOCK, G.O.

1973

FIRST-YEAR VEGETATION AFTER FIRE, RESEEDING, AND FERTILIZATION ON THE ENTIAT EXPERIMENTAL FOREST.

U.S. FOREST SERVICE, PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION, PORTLAND, OREGON, RESEARCH NOTE PNW-195. 23 P.

VEGETATIVE COVER MEASUREMENTS WERE MADE ON PERMANENT BELT TRANSECTS DURING 1971 ON FOUR WATERSHEDS SEVERELY AND UNIFORMLY BURNED IN 1970 THAT RECEIVED THE FOLLOWING TREATMENTS: SEEDED AND FERTILIZED WITH AMMONIUM SULFATE, SEEDED AND FERTILIZED WITH UREA, SEEDED ONLY, AND CONTROL (NO FERTILIZER, NO SEEDING). COMPARISONS BETWEEN SEEDED WATERSHEDS AND THE UNSEEDED, UNFERTILIZED CONTROL INDICATE THAT EROSION CONTROL SEEDING IMPROVED FIRST-YEAR VEGETATIVE COVER BY UP TO ONE-THIRD. OF THE SEEDED SPECIES, ORCHARD GRASS, HARD FESCUE, AND TIMOTHY PROVIDED MOST OF THE FIRST-YEAR COVER. PERENNIAL RYE AND YELLOW SWEETCLOVER SHOWED POOR DEVELOPMENT. EFFECTIVENESS OF FERTILIZER WAS QUESTIONABLE THE FIRST YEAR SINCE TOTAL COVER ON THE SEEDED-ONLY WATERSHED WAS NEARLY AS GREAT AS ON THE WATERSHED SEEDED AND FERTILIZED WITH AMMONIUM SULFATE AND GREATER THAN ON THE WATERSHED SEEDED AND FERTILIZED WITH UREA. HOWEVER, OBSERVATIONS IN THE EARLY SUMMER OF 1972 INDICATE THAT VEGETAL COVER ON THE FERTILIZED WATERSHEDS WAS SUBSTANTIALLY HIGHER THAN ON THE CONTROL OR SEEDED-ONLY WATERSHED. ALSO, VIGOR OF SEEDED SPECIES APPEARED TO BE MUCH BETTER ON THE FERTILIZED WATERSHEDS. 17 REFERENCES.

TURELLE, J.W.

1973

FACTORS INVOLVED IN THE USE OF HERBACEOUS PLANTS FOR EROSION CONTROL ON ROADWAYS. IN SOIL EROSION: CAUSES AND MECHANISMS, PREVENTION AND CONTROL, P. 99-104.

NATIONAL RESERACH COUNCIL, HIGHWAY RESEARCH BOARD, SPECIAL REPORT 135.

IN ROAD CONSTRUCTION NUMEROUS SOIL MATERIALS ARE BEING EXPOSED THAT COMMONLY HAVE PHYSICAL AND CHEMICAL PROPERTIES UNFAVORABLE TO PLANT GROWTH, THEREBY MAKING ROADWAY STABILIZATION DIFFICULT. THE BASIC PRINCIPLES FOR ESTABLISHING VEGETATION ARE PRESENTED ALONG WITH A RECOMMENDATION THAT, WHERE FEASIBLE, SLOPES STEEPER THAN 3:1 BE FLATTENED. VARIOUS PLANTING METHODS AND REQUIREMENTS FOR SELECTING PLANT SPECIES ARE DISCUSSED, EMPHASIZING THE NECESSITY FOR MULCHING AND MAINTANING ESTABLISHED VEGETATION. 6 REFERENCES.

U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF WATER PLANNING AND STANDARDS.

1975

METHODS OF QUICKLY VEGETATING SOILS OF LOW PRODUCTIVITY, CONSTRUCTION ACTIVITIES.

SAME AS AUTHOR, 467 P.

THIS STUDY HAS PRODUCED A USER S MANUAL FOR THE 50 STATES ON LATEST METHODS AND PROCEDURES FOR ESTABLISHING DENSE STANDS OF PERENNIAL VEGETATION ON SOILS OF LOW PRODUCTIVITY THAT HAVE BEEN DISTURBED BY CONSTRUCTION ACTIVITIES, AND WILL HOLD THE SOIL IN PLACE AND THUS MINIMIZE WATER POLLUTION BY SEDIMENTATION. EMPHASIS OF THE MANUAL IS ON VEGETATING SOILS THAT NATURALLY ARE LOW IN PRODUCTIVITY. SOIL GREAT GROUPS THAT FIT THIS CRITERIA REPRESENTING 39 PERCENT OF THE U.S. LAND AREA ARE DISCUSSED. THE SOIL AND PLANT RESEARCH OF MANY SCIENTISTS ARE RELATED AND EXAMINED. DEMONSTRATION SITES AT TEN LOCATIONS ARE CHARACTERISED AND DOCUMENTED: CALIFORNIA, IDAHO, NEW MEXICO, COLORADO, TEXAS, MISSISSIPPI, WEST VIRGINIA, VIRGINIA, MASSACHUSETTS, AND ALASKA. 52 REFERENCES.

URSIC, S.J.

1963

PLANTING LOBLOLLY PINE FOR EROSION CONTROL IN NORTH MISSISSIPPI.

U.S. FOREST SERVICE, SOUTHERN FOREST EXPERIMENT STATION, OXFORD, MISSISSIPPI, RESEARCH PAPER SO-3. 20 P.

A CONTINUOUS, INTERLACED MAT OF PINE LITTER ONE-HALF INCH OR MORE IN DEPTH WILL LARGELY HALT SOIL MOVEMENT. SEVERAL TYPES OF SPECIES OF PLANTS HAVE BEEN TESTED FOR THIS PURPOSE, BUT LOBLOLLY PINE HAS BEEN FOUND TO HAVE THE MOST ADVANTAGES AND THE FEWEST DISADVANTAGES. THIS PAPER REVIEWS RESEARCH REGARDING LOBLOLLY PINE AND DIRECT SEEDING ON ERODING SITES; THE PACKING, SHIPPING, AND STORING OF PLANTING STOCK; SUCCESSFUL EROSION-CONTROL PLANTINGS; SURVIVAL; PROTECTION; AND MANAGEMENT. 38 REFERENCES.

VALLENTINE, J.F.

1971

SPECIAL RANGE TREATMENTS. IN HIS RANGE DEVELOPMENT AND IMPROVEMENTS, P. 301-324.

BRIGHAM YOUNG UNIVERSITY PRESS, PROVO, UTAH. 516 P.

MECHANICAL LAND TREATMENTS SUCH AS FURROWING, TERRACING, RIPPING, PITTING, AND WATER SPREADING ARE WATER CONSERVING PRACTICES ADAPTED TO CERTAIN RANGE SITES. EXPECTED BENEFITS INCLUDE INCREASED FORAGE QUALITY AND QUANTITY WITH EROSION CONTROL AS A FREQUENT MAJOR CONSIDERATION. INTERSEEDING PROVIDES AN ALTERNATIVE TO COMPLETE SEEDBED PREPARATION WHEN EROSION HAZARD IS HIGH, WHEN SEEDBED PREPARATION IS IMPRACTICAL, OR WHERE THE PURPOSE IS TO MODIFY RATHER THAN REPLACE THE PRESENT STAND. EACH METHOD IS DISCUSSED AND ITS APPLICATION, USE, AND NECESSARY EQUIPMENT DESCRIBED. 50 REFERENCES.

WALKER, E.H.

1963

RELATIVE RATES OF EROSION UNDER GRASS AND FOREST IN A VALLEY OF WESTERN WYOMING.

NORTHWEST SCIENCE 37(3):104-111.

EROSION PROCEEDED TWICE AS FAST UNDER GRASS AS UNDER THE CONIFEROUS FOREST. DENUDING THE SLOPES WILL INCREASE THE AMOUNT OF SEDIMENT DELIVERED TO FALL CREEK BY AT LEAST 50 PERCENT. THE DIFFERENCE IN VEGETATION PROBABLY CAUSED THE ASSYMETRY OF THE VALLEY THROUGH EROSION DIFFERENCES. POSSIBLY THE ASSYMETRY OF MANY VALLEYS WHERE VEGETATIVE CONTRAST DOES NOT NOW EXIST, WAS CAUSED IN THE PAST WHEN CLIMATIC DIFFERENCES PRODUCED VEGETATIVE DIFFERENCES ON THE SLOPES. 9 REFERENCES.

WEIN, R.W./WEST, N.E.

1971

SEEDLING SURVIVAL ON EROSION CONTROL TREATMENTS IN A SALT DESERT AREA.

JOURNAL OF RANGE MANAGEMENT 24(5):352-357.

IN UTAH IN 1970 COUNTS OF CRESTED WHEATGRASS AND VOLUNTEER SPECIES WERE MADE ON GULLY PLUGS AND CONTOUR FURROWS IN THE SPRING TO DETERMINE EMERGENCE AND IN THE SUMMER TO DETERMINE SURVIVAL RATES. WHILE MANY SEEDLINGS EMERGED IN RESPONSE TO WINTER AND EARLY SPRING PRECIPITATION, THIS MOISTURE WAS QUICKLY DEPLETED AND THE RETENTION OF MOISTURE FROM SUMMER STORMS DETERMINED THE SEEDLING SURVIVAL PATTERN. DROWNING WAS APPARENT IN GULLY PLUG BOTTOMS WHILE SLOPES RETAINED LITTLE WATER AND ONLY AT THE HIGH WATER LINE OF THE GULLY PLUG RETENTION DAM AND AT THE FURROW BOTTOMS WAS THERE ENOUGH MOISTURE TO BENEFIT SEEDLINGS. IT IS DOUBTFUL THAT GULLY PLUGS WILL CONTRIBUTE GREATLY TO INCREASING FORAGE ON COVER WHILE FURROWS WILL BE OF A GREATER VALUE. 17 REFERENCES.

WILLISTON, H.L.

1963

EARLY YIELD OF EROSION CONTROL PLANTATIONS IN NORTH MISSISSIPPI.

U.S. FOREST SERVICE, SOUTHERN FOREST EXPERIMENT STATION, NEW ORLEANS, RESEARCH NOTE SO-1. 7 P.

A SURVEY OF 8,005 ACRES OF PULPWOOD-SIZE PINE PLANTATIONS ON ERODED SITES SHOWED THAT SURVIVAL WAS 38 PERCENT IN LOBLOLLY, 48 PERCENT IN SHORTLEAF, AND 29 PERCENT IN SLASH. AVERAGE ANNUAL GROWTH PER ACRE WAS 0.89 CORD FOR LOBLOLLY, 0.58 CORD FOR SHORTLEAF, AND 0.88 CORD FOR SLASH. FORM CLASS WAS 2 TO 3 PERCENTAGE POINTS BETTER IN LOBLOLLY THEN IN SHORTLEAF. ESTIMATES OF ROUGH CORD VOLUME PER ACRE OF LOBLOLLY AND SHORTLEAF CAN BE MADE WITH THE REGRESSION EQUATIONS AND TABLES BASED ON THIS SAMPLE. CASE HISTORIES AND OBSERVATIONS SUGGEST HOW PLANTATIONS CAN BE MANAGED FOR TIMBER AS WELL AS FOR SITE PROTECTION AND IMPROVEMENT. 7 REFERENCES.

WILLISTON, H.L.

1967

GROWTH OF PINE PLANTED FOR EROSION CONTROL IN NORTH MISSISSIPPI.

U.S. FOREST SERVICE, SOUTHERN FOREST EXPERIMENT STATION, NEW ORLEANS, LOUISIANA, RESEARCH NOTE SO-67. 4 P.

THIS NOTE REPORTS THE GROWTH, OVER A 5-YEAR SPAN, OF PULPWOOD-SIZE PLANTATIONS ESTABLISHED TWO DECADES AGO ON ERODING SITES IN THE YAZOA-LITTLE TALLAHATCHIE WATERSHED IN MISSISSIPPI. NINETY-NINE OF THE PLANTATIONS WERE LOBLOLLY PINE, 88 WERE SHORTLEAF, AND 12 WERE SLASH PINE. DIAMETER AT BREAST HEIGHT (DBH), FORM CLASS, MERCHANTABLE HEIGHT, AND TOTAL HEIGHT WERE RECORDED FOR EACH SELECTED TREE. RESULTS INDICATE THAT ALTHOUGH THE AVERAGE LOBLOLLY IS APPROXIMATELY THE SAME AGE AS THE AVERAGE SHORTLEAF PLANTATION IT HAS OUTPRODUCED THE SHORTLEAF BY 8 CORDS PER ACRE. SUPERIOR EARLY GROWTH OF LOBLOLLY OVER THAT OF SHORTLEAF IS WELL-DOCUMENTED THROUGHOUT NORTH MISSISSIPPI AND WEST TENNESSEE. 7 REFERENCES.

WOOLUM, A.G., II.

1962

GRASS SEEDING AS A CONTROL FOR ROADBANK EROSION.

U.S. FOREST SERVICE, PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION, PORTLAND, OREGON, RESEARCH NOTE PNW-218. 5 P.

GRASS WAS SEEDED ON A STEEP LOADCUT IN LOGGING AREA IN OREGON TO DETERMINE THE EFFECTS OF SEEDING GRASS IN EROSION CONTROL. PRECIPITATION, RUNOFF, AND SEDIMENT ACCUMULATION WERE COMPARED BEFORE AND AFTER TREATMENT. AN INCREASE IN RUNOFF AND A DECREASE IN EROSION WERE NOTED AFTER THE ESTABLISHMENT OF GRASS. THE INCREASE IN RUNOFF MAY BE A RESULT OF INTERCEPTION BY THE GRASS, OR THE PROTECTIVE MAT FORMED BY THE GRASS WHICH MAY HAVE SHED THE WATER. WATER RUNNING OVER AND THROUGH THE MATTED GRASS WAS NOT IN CONTACT WITH THE SOIL, REDUCING SURFACE EROSION. 0 REFERENCES.