

Dedication

To my father ...

Mother ...

Brothers ...

Sisters ..

To my best friends
and my best teachers

Acknowledgement

I would like to express my gratitude and thanks fullness to my supervisor Dr. Khalifa Ahmed Khalifa for hir willingness and helpful guidance through this study.

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Abstract

The study was conducted at the experimental farm of the department of crop production at the college of agricultural studies of the Sudan university of sciences and technology. Three different methods of land preparation have been tested (conventional tillage , minimum tillage and zero tillage) . Conventional tillage represented by a disc plough followed by disc harrow and soil leveler(DPDH). Minimum tillage represented by rotary plough followed by disc harrow and soil leveler (RPDH) and zero tillage is practiced without implement .The main purpose of the study was to determine the most appropriate method of land preparation for Abu70 fodder crop . Randomized completed block design have been used to conduct the experiment. The effect of different tillage methods on soil moisture content , bulk density and infiltration rate has been determined also, the generated data was subjected to statistical analysis.

The effect of previously mentioned tillage groups upon some plant parameters such as the germination , length of plants, number of leaves per plant , leaf area index and average yield in tons per hectare have been tested also. According to the obtained results it was not clear which of the tested tillage methods was the most appropriate for forage production. Evaluation of the different tillage methods according to those results was rather difficult and we were obliged to test for the economical analysis to identify which method is the most suitable for land preparation .

According to the economical analysis the least land preparation cost was zero tillage which is 2SDG. The second lower cost obtained with conventional tillage is 43.138SDG, where as the highest cost was .obtained with minimum tillage 44.588SDG

ملخص البحث

أجريت التجربة بمزرعة قسم المحاصيل بكلية الدراسات الزراعية بجامعة السودان للعلوم والتكنولوجيا حيث اختبر ثلاثة نظم للحراثة (الحراثة التقليدية -أقل حراثة - الحراثة الصفيرية) بمجموعة من الآليات لتحضير الأرض ، حيث أجريت الحراثة التقليدية بواسطة المحراث القرصي متبوعاً بمشط قرصي- وآلة تسوية التربة. أما أقل حراثة أجريت بالمحراث الدوراني متبوعاً بشمط قرصي- وآلة تسوية التربة ، وأخيراً الحراثة الصفيرية بدون استخدام آلة. صممت التجربة علي نظام القطاعات العشوائية الكاملة . خضعت النتائج المتحصل عليها للتحليل الاحصائي. ثم اختبر أثر الحراثة المختلفة لتحضير الأرض على كل من المحتوى الرطوبي للتربة ، الكثافة الظاهرية للتربة ومعدل التسرب للماء في التربة. أيضاً اختبر أثر استخدام الحراثة علي بعض خصائص النبات متمثلة في معدل الانبات ، طول النبات ،عدد الأوراق في النبات الواحد ،مساحة سطح الورقة في النبات الواحد ثم متوسط الإنتاجية بالطن / الهكتار.أوضحت نتائج هذه التجربة أنه هنالك اختلاف بسيط نتيجة لاستخدام الطرق المختلفة لتحضير الأرض في المحتوى الرطوبي للتربة وكثافتها الظاهرية حيث كانت الاختلافات في النتائج التي تم التوصل إليها. كما اوضحت الدراسة أيضاً عدم وجود اختلافات معنوية في الإنتاجية.كانت هنالك صعوبة بالغة لتحديد أي من طرق الحراثة المختبرة أكثر ملاءمة لتحضير الأرض لإنتاج علف ابو سبعين وذلك بسبب النتائج المتقارب بدرجة كبيرة وعدم وجود فروقات معنوية تمكن من التفضيل فنياً بين الطرق المختبرة للإنتاجية العلف ، نتيجة لكل ما ذكر تحتم علينا اللجوء للتحليل الاقتصادي لطرق تحضير الأرض المختلفة ، وفقاً للتحليل الاقتصادي وجد أقل تكلفة لتحضير الأرض مع الحراثة الصفيرية وهي 2SDG ، ثاني اقله تكلفة وجدت مع الحراثة التقليدية وهي 43.138SDG ، أعلى تكلفة وجدت مع الحراثة الخفيفة وهي 588SDG.44.

List of Contents

Subject	Page
Dedication	I
Acknowledgement	II
English Abstract	III
Arabic Abstract	IV
List of Contents	V
List of Tables	IX
List of Plates	X
List of Figures	X
Chapter One	1
Introduction	
Chapter Two	
Literature Review	
2-1 Definition of Tillage	3
2-2 Tillage objectives	4
2-3 Types of tillage	4
2-4 Tillage systems	6
2-5 Evaluation of Tillage operations	9
2-6 Effect of Tillage on soil structure	9
2-7 Effect of Tillage on soil moisture content	10
2-8 Effect of Tillage on soil bulk density	11

2-9 Effect of Tillage on infiltration rate	11
2-10 Effect of Tillage on crop yield	12
2-11 Forage sorghum production in the Sudan	13
2-12 Phenotypic variability	14
Chapter Three	
Materials and Methods	
3-1 Materials	
3-1-1 Experimental Site	16
3-1-2 Soil	16
3-1-3 Meteorological data	17
3-1-4 Infiltration rate Measurement Equipments	18
3-1-5 Bulk density Measurement Equipments	18
3-1-6 Moisture content Measurement equipments	18
3-1-7 Seed material	19
3-1-8 Balances	19
3-1-9 Wasoog	19
3-1-10 Measuring tape	19
3-1-11 Tillage Equipments	19
3-1-11-1Tractor	19
3-1-11-2 Disc plough	20
3-1-11-3Disc harrow	22
3-1-11-4 Rotary plough	22
3-1-11-5 Soil leveler	22
3-2 Methods	25
3-2-1 Land preparation	25
3-2-2 Experimental layout	25

3-2-3 Experimental design	26
3-2-4 Measurement of infiltration rate	26
3-2-5 Measurement of soil bulk density	26
3-2-6 Measurement of soil moisture content	27
3-2-7 Seeds germination Percentage	27
3-2-8 Plant height	27
3-2-9 Leaves number	28
3-2-10 Leaf area index	28
3-2-11 Harvesting	28
3-2-12 Crop yield	28
3-2-13 Cost determination	29
Chapter Four Results and Discussion	
4-1 Effect of different tillage treatments on infiltration rate	35
4-2 Effect of different tillage treatments on soil moisture content	38
4- 3 Effect of different tillage treatments on soil bulk density	40
4- 4 Seeds germination percentage	42
4- 5 Effect of different tillage treatments on plants height	43
4-6 Effect of different tillage treatments on leaves number per plant	43
4-7 Effect of different tillage treatments on leaf area index	45
4-8 Crop yield	46

Chapter Five	
Conclusions and Recommendations	
5-1 Conclusions	48
5-2 Recommendations	48
References	49
Appendixes	53

List of Tables

Title	Page
Table(3-1)Soil characteristic	16
Table(3-2)available nutrient content	17
Table(3-3) Meteorological data	17
Table(4-1) Measurement of infiltration rate mm/min	35
Table(4-2)Effect of different tillage treatments on infiltration rate mm/min	35
Table(4-3) Measurement of soil moisture content (%)	38
Table(4-4) Effect of different tillage treatments on soil moisture content (%)	38
Table(4-5) Measurement of soil bulk density	40
Table(4-6) Effect of different tillage treatments on soil bulk density	40
Table (4-7) Seeds Germination percentage	42
Table (4-8) Effect of different tillage treatments on plants height in(cm)	43
Table (4-9) Effect of different tillage treatments on leaves number per plant	44

Table (4-10) Effect of different tillage treatments on leaf area index	45
Table (4-11) Effect of different tillage treatments on Crop yield (Fresh weight)in (Kg/ha)	46
(4-12)Effect of different tillage treatments on Crop yield (Dry weight) in (kg/ha)	47

List of plates

Title	Page
Plate (3-1) Disc Plough	21
Plate (3-2) Tractor	21
Plate (3-3) Disc Harrow	23
Plate (3-4) Soil Leveller	23
Plate (3-5) Rotary plough	24
Plate (3-6) Green plant	24

List of figures

Title	Page
Figure (4-1)Measurement of infiltration rate mm/min	37
Figure (4-2)Effect of different tillage treatments on infiltration rate mm/min	37
Figure (4-3) Measurement of soil moisture content (%)	39
Figure (4-4) Effect of different tillage treatments on soil moisture content (%)	39
Figure(4-5) Measurement of soil bulk density	41
Figure(4-6)) Effect of different tillage treatments on soil bulk density at different depths	41

