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للدراسات الجغرافية والبيئة

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مجلة القُلزم للدراسات الجغرافية والبيئية

الآراء والأفكار التي تنشر في المجلة
تحمل وجهة نظر كاتبها ولا تعبر بالضرورة عن آراء المركز

ترسل الأوراق العلمية على العنوان التالي
هاتف: +249910785855 - +2491215662071
بريد إلكتروني: rsbcrsc@gmail.com
السودان – الخرطوم – السوق العربي
عمارة جي تاون – الطابق الثالث

موجهات النشر

تعريف المجلة:

مجلة (القلزم) للدراسات الجغرافية والبيئة، مجلة علمية مُحكمة، تصدر عن مركز بحوث ودراسات دول حوض البحر الأحمر. تهتم المجلة بالبحوث والدراسات التي تخص حوض البحر الأحمر والدول المطلة عليه والمواضيع ذات الصلة.

موجهات المجلة:

1. يجب أن يتسم البحث بالجودة والأصالة، وألا يكون قد سبق نشره قبل ذلك.
2. على الباحث أن يقدم بحثه من نسختين. وأن يكون بخط (Traditional Arabic) بحجم 14 على أن تكون الجداول مرقمة وفي نهاية البحث وقبل المراجع على أن يشار إلى رقم الجدول بين قوسين دائريين ().
3. يجب ترقيم جميع الصفحات تسلسلياً وبالأرقام العربية بما في ذلك الجداول والأشكال التي تلحق بالبحث.
4. المصادر والمراجع الحديثة يستخدم أسم المؤلف، اسم الكتاب، رقم الطبعة، مكان الطبع، تاريخ الطبع، رقم الصفحة.
5. المصادر الأجنبية يستخدم اسم العائلة (Hill, R).
6. يجب ألا يزيد البحث عن 30 صفحة، وبالإمكان كتابته باللغة العربية أو الإنجليزية.
7. يجب أن يكون هناك مستخلص لكل بحث باللغتين العربية والإنجليزية على ألا يزيد على 200 كلمة بالنسبة للغة الإنجليزية. أما بالنسبة للغة العربية فيجب أن يكون المستخلص وافياً للبحث بما في ذلك طريقة البحث والنتائج والاستنتاجات، مما يساعد القارئ العربي على استيعاب موضوع البحث وبما لا يزيد عن 300 كلمة.
8. لا تلزم هيئة تحرير المجلة بإعادة الأوراق التي لم يتم قبولها للنشر.
9. على الباحث إرفاق عنوانه كاملاً مع الورقة المقدمة (الاسم رباعي، مكان العمل، الهاتف، البريد الإلكتروني).

نأمل قراءة شروط النشر قبل الشروع في إعداد الورقة العلمية.

بسم الله الرحمن الرحيم

الحمد لله رب العالمين، والصلاة والسلام على سيدنا محمد
وعلى آله وصحبه وسلم تسليماً كثيرا

وبعد:

القارئ الكريم ،،،

الحمد لله رب العالمين، والصلاة والسلام على سيدنا ونبينا محمد وعلى آله وصحبه أجمعين.

السادة القراء الكرام سلام من الله ورحمة منه وبركات، ونحن نطل على حضراتكم من نافذة جديدة من نوافذ النشر العلمي للبحوث والدراسات من ضمن سلسلة مجلات القلزم العلمية المتخصصة، والتي تصدر عن مركز بحوث ودراسات دول حوض البحر الأحمر (السودان)، وهي مجلة القُلزم العلمية للدراسات الجغرافية والبيئية.

القارئ الكريم:

تصدر هذه المجلة المتخصصة بالشراكة مع جامعة سنار (السودان) في إطار اتفاقية التعاون العلمي الموقعة بين الطرفين؛ إيماناً منهما بأهمية الدراسات الجغرافية والبيئية على المستوى الإقليمي والدلي، وبحمد الله وتوفيقه قد تكللت هذه الشراكة بالنجاح والتوفيق وأثبتت عملياً جدواها في مجال النشر العلمي وذلك بتعاون الهيئات العلمية لهذه المجلة.

القارئ الكريم:

إن السرعة والجدية التي تلتزم بها مجلات القُلزم المتخصصة المختلفة وفرت منصة مهمة للباحثين لنشر دراساتهم وبحوثهم، وأسهمت في تشجعيهم على ذلك.

وأخيراً نأمل أن يجد القارئ الكريم مادة علمية جديدة مفيدة في عددنا الخامس عشر من مجلة القُلزم العلمية للدراسات الجغرافية والبيئية، ونتمنى في مقبل أعدادنا مزيداً من التجويد والإتقان

مع خالص الشكر والتقدير ،،

هيئة التحرير

المحتويات

The role of plants residues in impoving some chemical properties of agricultural soil in khordagat area Northen Kordofan state

Dr. Widaa. Ahmed. Eltieyb

Assoc. professor, in organic chmesitry Dallanj University

Dr. Zeinab Mohmmed Mustfa Elimam

Assistant. professor, in Analytical chmesitry Dallanj University

Abstract:

The present study was conducted in Khordagat area- Northern Kordofan state.It aims at investigating the role of plants residues such as Dura residues, Baima residues and watermill residues. in improving some chemical properties (nitrogen ratio, phosphorus and potassium) of agricultural soil. The experimental design used was RCB different with three replications. Indore method for composting (layering sequence in buckets) was used. Treatment components, these treatments were : soil before treatment (A). soil plus Dura residues, (B). poor soil plus Baima residues (C) poor soil plus watermill residues (D). Representative sample were taken for analysis for the chemical properties .The nitrogen ratio, in case of the soil plus Dura residues gave (1.4%), while the soil before treatment gave (1%). In contrast, the soil before treatment showed only 8 ppm but the soil before treatment gave (5ppm) in case the phosphorus on soil plus Dura residues also. In case of potassium amount the soil plus the Baima residues gave 10.4ppm, whereas the soil

before treatment gave 7ppm. it is highly advised to improve the chemical properties of the simple soil using under study as combined with composite. And also to recommended by independent or Groups residues to improve simple soil.

Keywards: Khordagat ,Bamia ,Dura, Watermill, compost.

دور المخلفات النباتية في تحسين بعض الخصائص الكيميائية للتربة الزراعية في منطقة خور طقت ولاية شمال كردفان

د. وداعة أحمد الطيب

أستاذ الكيمياء العضوية - جامعة الدلنج

د. زينب محمد مصطفى الإمام

ستاذ الكيمياء التحليلية - جامعة الدرلنج

المستخلص:

لقد أجريت هذه الدراسة في منطقة خورطقت بولاية شمال كردفان هدفت هذه الدراسة إلي تحسين بعض الخصائص الكيميائية للتربة الزراعية الغرض الأساسي للدراسة هو البحث عن دور استخدام مخلفات الذرة، البامية والبطيخ لتحسين الخصائص الكيميائية، (نسبة النتروجين، كمية الفسفور والبوتاسيوم وقد استخدمت في التجربة طريقة BCR لثلاث تكرارات مختلفة كما استخدمت طريقة إندور لتكوين الطبقات كانت المعاملة كما يلي : التربة قبل المعاملة (A)، التربة بإضافة مخلفات الذرة (B)، التربة بإضافة مخلف

البامية (C)،واخيرا التربة مضافة إليها مخلف البطيخ (D). أخذت العينات لتحليل الخصائص الكيميائية كانت النتيجة نسبة النتروجين في التربة مضافا إليها مخلفات الذرة تعطي (4.1%)، بينما كانت في التربة قبل المعالجة (1%). فيما يتعلق بكمية الفسفور فإن التربة الذرة جاءت النتيجة (8 جزء من

المليـون) بينـما كانـت في التربـة قبـل المعالجـة (5 جزء مـن المليون). بالنسـبة لكمية البوتاسـيوم فـإن التربة مـع مخلفـات الباميـة أعطيـت (4.01 جـزء مـن المليـون) بينـما كانـت في التربـة قبـل المعالجـة (7 جـزء من المليـون). وبنـاء عـلي نتائـج هـذه الدراسـة يـوصى بشـدة بتحسـين الخصائـص الكيميائيـة للتربـة الزراعيـة باسـتخدام بقايـا مخلفـات المحاصيـل الزراعيـة التـي أجريت عليهـا الدراسـة مخلوطة مع مركبـات للحصول عـلي إنتـاج أفضـل. كـما يـوصى بالاعتـماد على مخلـف الـذرة لتحسـين التربـة الزراعية.

كلمات مفتاحية: خور طقت، بامية، ذرة، بطيخ والسماد البلدي.

Simple Soils:

simple soils(Bryima2004 (like gardoud comprise about 22% of total area of Kordofan state where 8% in the northern part and 14% in the southern part of Kordofan. poor soils represent 24% of the total available soil for cultivation, grazing and forestry. Other names such as (Naga'a, Atmur, Moglad, Barasa, Hemira and Hadaba) were also given to Gardoud soils.

The general characteristics of these soils are partially truncated, whereby the sandy top soils were removed by wind. Hence the loamy subsoil is exposed due to the impact of rain drops which rendered them hard and solid.

The plants of poor soils are different from that of the clay soils, although there is interference between them. However poor soil plants are without, thorns they have wide leaves and heavy shadows beside some herbs can grow among them. The poor soils also can keep water for a long time after the end of the rainy season, which helps the pastoralists to get water for drinking. (Bryima 2004).

1. Nitrogen:

In most soils, over 90% of the nitrogen content is organic. This organic nitrogen is primary the product of the biodegrading of dead plants and animal. It is eventually hydrolyzed to NH^{+}**4**, which can be oxidized to NO^{-}_{3} by the action of bacteria in the soil. Nitrogen bound to soil humus is especially important in maintaining soil fertility.

Nitrogen is an essential component of proteins and other constituents of living matter. Plants and cereals grown on nitrogen . Rich soils not only provide higher yield, but are often sensationally richer in proteins and therefore, more nutritious. (Manahan; 2000).

Also the nitrogen element in general stimulates vegetative growth derived as it is from the fruit, indirectly from the application of nitrogenous fertilizer which increase intermeddle length and thus increases the tendency towards rank growth (Munro ; 1987), Nitrogen makes up 78% of the air by volume.

Generally nitrogen varies more in quantity in the soil than do the other elements essential for plant growth which are taken from the soil. This statement is not true always because there are young soil developing in material containing limestone which are very high in calcium percentage, The concentrations of phosphorus occur in some soil near phosphate deposits, nitrogen content variable than is the content of other nutrient elements. This variability is not confined to soil in different climatic zone or to those having different vegetative cover although these are influential factors (Millar; 2004).

Nitrate from wells is a common and especially damaging manifestation of nitrogen pollution from feedlots, because of the susceptibility of ruminant animals to nitrate poisoning .The stomach contents of ruminant animals such as cattle and sheep constitute a reducing medium and contain bacteria capable of reducing nitrate ion to toxic nitrite ion :

$$NO^{-}\mathbf{3} + 2H^{+} + 2e^{-} \rightarrow NO^{-}\mathbf{2} + H\mathbf{2}O$$

The origin of most nitrate produced from feedlot wastes is amine nitrogen which is present in nitrogen excreted by cattle found is contained in the urine –part is in the form of urea as first step in the degradation process, the amino nitrogen is probably hydrolyzed ammonia or ammonium ion:

$$RNH\mathbf{2} + H\mathbf{2}O \rightarrow R\text{-}OH + NH\mathbf{3} \rightarrow NH^{+}\mathbf{4} + OH$$

This product is them oxidized through microorganism (Millar ;2004).

The soil including ammonium ($NH^{+}4$), nitrates ($NO^{-}3$) , nitrite ($NO^{-}2$) and gases nitrogen oxides (NO,NO2) (Testal Wallson 1987) .

The soil nitrogen content fluctuates with soil and fertilizer management including growth of leguminous versus no leguminous crops. The production and use of nitrogen fertilizers is a substantial portion of the nitrogen cycle. The nitrogen ratio in the gas produced during fertilizer denitrification tends to be higher than normal denitroficaton. (Hinrich. et: al; 1979).

2. Phosphorus:

Although the percentage of phosphorus in plant material is relatively low, it is an essential compound of plants. Phosphorus, like nitrogen, must be present in a simple inorganic form before it can be taken up by plants in the case of phosphorus, the utilizable form of phosphorus is orthophosphate ion. In the PH range that is present in most soils, $H2PO^{-}4$ and $HPO^{2-}4$ are the predominant ions which are precipitated or absorbed by species of AL (II) and Fe (II) (Manahan; 2000).There are many methods to prepare phosphate.. The following equations explain some of them:

1. 1. The orthophosphate preparation

   Ca_{10} (PO4)6 F2 + 10H2SO4 +4H2O → 6H3PO4 +10CaSO4 +4H2O +2HF

2. The super phosphate

   Ca_{10} (PO4) F2 + 7H2SO4 +3H2O → 3Ca(H2PO4)2H2O +7CaSO4 +2H2O +2HF

3. The concentrated super phosphate

   Ca_{10} (PO4)6 F2 + 4H3PO4 +6H2O → 10Ca (HPO4).6H2O +2HF

4. The calcium phosphate

It contains about 23% phosphorus, the preparation is represented by the following equation

$$2H_3PO_4 + 2Ca(OH)_2 \rightarrow Ca_2H_2(PO_4)_2 + 4H_2O$$

In alkaline soils, orthophosphate may react with calcium carbonate to form relatively insoluble hydroxide.

$$3H_3PO_4 + 5CaCO_3 + 2H_2O \rightarrow Ca_5(PO_4)_3(OH) + 5HCO_3^- + 4OH^-$$

In general, because of those reactions, little phosphorus applied as fertilizer leaches from the soil.

This is important from the stand point of both water pollution and utilization of phosphate fertilizer. (Manahan; 2000).

The phosphate help fixation of soils, so the fixation reaction can occur, between phosphate and Fe or AL ions and Fe or AL hydrous oxides. (Kim H. Tan, 1998).

3.Potassium:

Relatively high levels of potassium are utilized by growing plants. Potassium activate some enzymes and plays, role in the water balance in plants. also essential for some carbohydrate transformation (Manahan; 2000). Where more potassium is removed from soil. When nitrogen fertilizers are added to soils to increase productivity. removal of potassium is enhanced. Therefore, potassium may become a limiting nutrient in soils as heavily fertilizer with other nutrients.Potassium is one of the most abundant elements in the earth crust, which makes up 2.6 % however, much of this potassium is not easily available to plants. For example, some silicate minerals such as Lucite, $K_2O.AL_2O_3 - 4SIO_4$, contain strongly bound potassium. Exchangeable potassium held by clay minerals is relatively more available to plants (Manahan; 2000).

Table No: (1): The nitrogen% age from animal's manure after decomposition on soil (2000, Burahan and Hagu).

Animal	Secretion types	Moisture	Nitrogen N%	Phosphorus P%	Potassium K%
Horses	Manure urine	75 90	0.56 1.52	0.35 -	0.1 0.92
Cows	Manure urine	86 91	0.44 1.05	0.12 -	0.04 1.36
Goats	Manure urine	57.6 86.5	0.72 1.31	0.44 0.01	- -

Fertilizers:

Crop fertilizers contain nitrogen, phosphorus and potassium as major components. Magnesium sulfate and micronutrients may also be added.

Fertilizers are designated by numbers such as 6 – 12 – 8 , showing the respective percentages of nitrogen expressed as N% (In this case 6%), phosphorus as P**2**O**5** 12% and potassium as K**2**O 8%. Farm manure corresponds to approximately 0.5 , 0.24 , 0.5 fertilizer.

The organic fertilizers such as manures must undergo biodegrading to release the simple inorganic species (NO^{-}_{3}, HPO^{2-}_{4}, K^{+}) accessible by plants (Manahan; 2000).

Materials and Methods:

Materials:

1. Soil Samples:

The soil employed in all treatments is the soil available around Khordagat area, characteristic by, this soil might be described as poor which has equal distribution of sand particles and it is therefore well suited for compost processing. (Musa, 2000)

2.The water:

Water source for compost processing was grand water and that reported by Civil Water Corporation form Obeid area Northern kordofan.

Methodology:

In this investigation simple soil reference sample, addition of plants remains, were represent different treatments to the soil in the field level. Temperature was recorded during decomposition of manures, chemical methods for element analysis using recommended procedures , every time is treated by animal remains and combination of all as compost, chemical analysis followed to determine some macro elements of treated soil.

1. Field Experiments

The experiments took place at shekan, Northern Kordofan state in Sudan. Seven treatments were applied A, B, C, and D. These treatments were Indoor designed system (Burhan and Hagu 2000و) according to international system of compost preparation **(1984b.Dulag .)**.

2. Procedure of composting

Twelve buckets of different treatments each with three replications. Each bucket was charged with alternating layers of materials according to the treatment . in sequence, for example in case of combinations, soil layer, animal manure, soil layer, and so on,figure (1). Each layer (10 – 15cm) thickness related to 1: 1 (1 =animals manures, 1= soil) according to Indoor system (0 **Burahan and Hagu2000**و) the last layer was covered by soil.The layers were sprayed with water in sequences as described by (Hamuda; 2001).

Fig (1):A sample of layering sequence of compost in the bucket

Soil layer
Plant residues
Soil layer
Plant residues
Soil layer
Plant residues

Table(2):Different treatments of the Replicates for compost preparation (The Number. Represent Bucket code)

No	Soil sample	Plant residues	Code	Number code
1	soil before treatment		A	1,2,3
2	soil	dura	B	4,5,6
3	soil	Bamia	C	7,8,9
4	soil	watermill	D	10,11,12

Each bucket was then covered with soil to form a high hump, then left to digest for two weeks after which the bucket was opened. And its content was dung out. These were thoroughly mixed, aerated for two days, (Hamuda; 2001) sprayed with water then returned to the bucket and covered. Same procedure was practiced for all treatments, finished in eight weeks the composting process was assumed as completed and the products were presumed ready.

During the period of eight weeks processing, the temperature was measured in each bucket every two days at six O'clock on evening.

In the field experiment, Twenty five Treatment each one replicates three time to give seventy five units, of the different treatments (A, B, C, and D) were prepared for making compost as shown in table (3.1).

3- Sampling:

After thorough mixing, the contents were ducked down from each bucket. Seven random samples were taken from the top, middle and bottom of each bucket. These were mixed to form the representative sample for that bucket (Cooke; 1969). Four samples were taken for chemical analysis. From which samples were used for determining the main chemical properties included (nitrogen, phosphorus, potassium and calcium content).

4- Laboratory Experiments:

a- Chemicals and Materials:

Sulphoric Acid (H_2SO_4) (0.01 N), Distilled water, Boric acid (H_3PO_3) Methyl 4 red indicator : (Riedel Dehaaeng seelze, Hanover), Sodium hydroxide (NaOH) Analar 98% NaOH. (B.D.H Chemicals).

Copper sulphate ($CuSO_4$), Sodium Bicarbonate ($NaHCO_3$, 90%) A.C.S reagent, Ammonium Hepta Molybdat . $(NH_4)_6 Mo_7O_{24}. 4H_2O$,(80 – 82) prolabo-paris, Carbon black, Stannous Chloride ($SnCl_2$ anhydrous 98%) A.C.S reagent (Aldrich), Potassium dihydorgen Phosphates (KH_2PO_4) = 136.09, Ammonium Sulphate ($NH_4)_2SO_4$ and Ammonium Acetates.$(NH4)(CH_3COO)$

b - Equipments:

Thermometer, Electronic sensitive balance, Dishes and Beakers, Buckets
Oven, Conical flasks, Droppers, Filter papers (run or ash less)
Glass rods, Macro-kjeldhal (digestion, distillation and titration)
Spectrophotometer 660 mμ, Flame photometer 410mμ
Titration equipments and Electronic calculator.

c- Procedures:

1. Determination of Nitrogen:

Organic nitrogen was converted to ammonium sulphate nitrogen by sulphoric acid with sulphate added to raise the boiling point. Copper sulphate was added as catalyst as described by kjeldhal (A.O.A.C; 1970) and (G.Schroth and F.L. Sinclair, 2002).

The ammonium ions (NH_4^+) in the acid digest were converted to ammonia (NH_3) which was then released from the solution by steam distillation and condensed as ammonium hydroxide (NH_4OH) this was titrated against standard HCL or H_2SO_4 (A.O.A.C; 1970) and (Black .C.A; 1965). The procedure was summarized as following:

(Digestion) Sample + $H_2S0_4 \rightarrow (NH_4)_2\ SO_4 + CO_2 + SO2 + H_2O$

$NH4)2\ SO4 + 2NaOH \rightarrow 2NH3 + Na_2SO4$

$2NH_3 + H_2SO_4$ (stand) $\rightarrow (NH_4)_2\ SO_4 + 2H_2O$

(Back titration) $H2SO_4$ (excess) + $2NaOH \rightarrow Na_2\ SO_4 + 2H_2O$

a. Digestion:

Two grams was taken from a sample into a digestive flask, two kjeldahl tablets plus 2.0 gram catalyst ($CuSO_4$) and 3ml of concentrated H_2SO_4 and added into kjeldahl digester at temperature range (110 – 120) ℃ for (3 - 3½) hours. (Madebo1988). This took place in a fume cupboard gently at first until vigorous effervescence subsides and then gradually increase heating using a heating block.

Boiling was continued till the digest is white with, charred organic matter remaining.

b. Distillation:

100 mls from Distilled water and 20 ml of NaOH (0.01) was taken into a flask plus 30 ml of digestive material then added to release ammonia, After that, distillation took place .

c. Titration:

5 ml of boric acid was taken into a conical flask and attached to distillation apparatus to receive the distilled ammonia 50 ml from titrated by H2SO4 (0.01 N) to the conical flask step by step until color change from green to red (Hamuda, 2001)

d. Calculations:

$$N\ \% = \frac{TV \times N \times 14 \times 6,25 \times 100}{W \times 1000}$$

Where:

TV = sample volume from titration (ml) N = normality of H**2**SO**4**

14 = Atomic weight 6, 25 = Conversion factor (Khatab 1996)

W = the weight sample.

2. Determination of Phosphorus (A.O.A.C;1970):

and (Fradark .R. Tarwa 1991)

A mixture of 2 grams of sample and 40 ml of (0.5 N) NaHCO**3** was shaken for 30 minutes, then filtered (Olsen et: al; 1954) and, (watanable; 1965)

Two mls of the clear filtrate was pipetted into a conical flask and to this mixture 2 ml of ammonium molybdate and (0.5) ml of stannous chloride was added then prepared working standard (Hamuda; 2001) and (A. Holder; 1977**)**

To this mixture 8 ml of ammonium molybdate standard solution containing 20 gms (NH**4)2** MoO**4** and 60 — 70ml (10N) HCl per litre of solution was

added. Further addition of 2,4-dinitro – phenol indictor and 2 ml of SnCl2 working standard were made (person,1970), and (Chapman;1961)

The final volume of the contents was brought up to 2 ml, the solution was ready for reading by the spectrophotometer at (660 mμ) reading.

a. Calculations:

$$P\text{-ppm} = \frac{P\text{-ppm} \times v}{S} \quad \text{(Fradark. R. Tarwa1991)}$$

Where:

P-ppm = the reading from spectrophotometer in part per million.

v = volume of $NaHCO_3$

S = weight of sample.

3. Determination of Potassium:

From sample 2.0 grams was weighed grams into a test-tube added 10 ml of ammonium acetate (1.0 N) and shaken in one minute, and filtered. The final volume of contents was brought up to 2ml; the solution was ready for flame photometer analyses. **(Fradark. R .Tarw 1991)**

a. Calculations:

$$K\text{-ppm} = \frac{K\text{-ppm} \times v}{S} \quad \text{(Fradark. R. Tarwa1991)}$$

Where:

K-ppm = the reading from Flame photometer with part per million.

v = volume of ammonium acetate

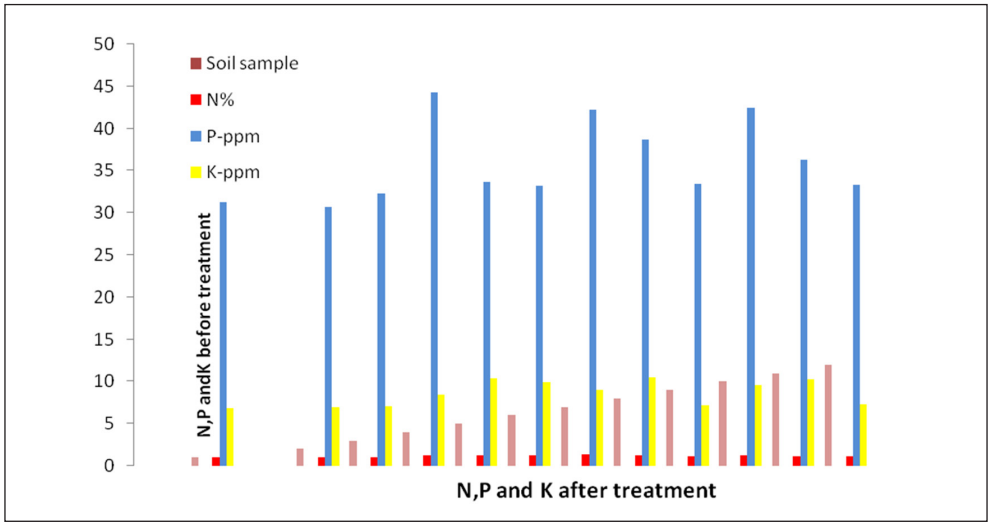
S = weight of sample

Results:

The result were summarized table(3) and figure(1)

Table (3) The N%, P-ppm and K-ppm on Soil before and after treatments

No	Soil sample	Plant residues	N%	P-ppm	K-ppm
1	soil before treatment	-	1	31.3	6.9
2		-	1	30.7	7
3		-	1	32.3	7.1
4	soil	Dura	1.3	44.3	8.5
5	soil	Baima	1.2	33.7	10.4
6	soil	watermill	1.2	33.2	9.9
7	soil	Dura	1.4	42.2	9
8	soil	Baima	1.2	38.7	10.5
9	soil	watermill	1.1	33.5	7.2
10	soil	Dura	1.3	42.5	9.6
11	soil	Baima	1.1	36.3	10.3
12	soil	watermill	1.1	33.3	7.3



Discussion:

The main results of this research can be summarized as follows:

Nitrogen%:

According to the result of the study the nitrogen percentage is about (1.1%) as minimum percentage recorded for the soil treated by watermill, and maximum value (1.3%) with soil that has been treated by Dura residues. As expected for dura residues to record high percentage for nitrogen because dura it rich carbohydrate and which fertilize the soil (Hamuda; 2001). And the percentage which has been recorded from this study is considered as good compared with previous studies in which nitrogen percentage was between (0.2 – 0.6) % (Balbaa 1998) on literature review. But the researcher (Burahan and Hagu2000) recorded that the nitrogen on Horses manures reached(1.52%) table(2-2) and other researchers stated that nitrogen on the organic matter reached up to 5% (Bates; 1954).And some other researchers thinks that nitrogen percentage in the compost reached up to 8.2 % (Parr, et: al; 1980).

Comparing this finding with previous studies (Hamuda 2001) can say that the nitrogen percentage from this study is fairly good. In this study, It is observed that the treated soil by combination has better rates from the soil treated only plants residues or animal's manures , was also observe that the soil before treatment has good nitrogen percentage1.0%)) comparing it with the study could find the higher percentage (1.3%) which means the addition is (0.3%).

Phosphorus in ppm:

As shown in table, it was found that phosphorus contents are between (33.3—44.3 ppm) in the soil treated by watermill residues as minimum but the soil treated by Drua residues, as the maximum by some researchers **(**Hamuda; 2001) has a high values of phosphorus than any other residues. Also the higher P compared with others, except bamia residues which is 36.2 ppm, in average value.

It was observed that simple soil before treatment has a higher phosphorus content from the minimum which is (33.3) ppm table which is mean simple soil is not poor in phosphorus content and this number compared with the previous studies in not small.

Some studies refer that phosphorus amount (according to the type of the soil) is ranged between (15 – 85 ppm). and the anistol phosphate (10 – 50) phosphorus. From this study compared with previous studies is not weak(Bates,;1954**)** and **(**Parr; 1980), other study the phosphorus between (0.3 —1 ppm) (Hamuda; 2001).

Potassium in ppm:

The values range (7.2 —10.5) ppm ,the maximum value present in soil plus Baima residues which is fulfic one of research hypothesis

In comparing other treatments of soil others plant residues, all of the cave similar percentage.

thought that potassium percentage reach up to 1.36 % for the plant which is from groundnut (Widaa;2010) . It was observe that the soil without treatment has appreciable potassium content compared with the study after the treatment, and this is agreeable with previous studies (Mohammed1989 (.

At the end is compare this study with gardoud soil before correction and after correction can say simple soil its neat repair **.**

Conclusion:

- Drua residues plus soil has the highest percentage from nitrogen (1.3%) because Drua residues are from compost (Hamuda; 2001),
- Also Dura have high percentage from phosphorus , this is affirmative as in many studies(Burahan and Hagu2000).
- Bamia have high percentage from potassium and the rest of macro elements according to the study. (Manal 2018,).

Recommendations:

Based on these reshlts the following recommentions can be state:

- simple soil (moglad) is productive soil if it is treated. by ploughing for three or four times, to percolate water into the internal layers. The production will improve as a result of this treatment. For that reason by adding manure this process will be easy and quickly for solving the physical problems which have been attempted by this study.
- Simple soil could to be repaired by planting forests according to national forest co-operation system to separate the soil and allow weeds to grow up, germinate and by this way it will be possible to solve problem of desertification .
- Northern Kordofan is a rich area for producing many of the crops especially groundnut, sesame and karkady for that reason; it is possible to repair the gardoud soil by intensive cultivation of these plant.
- Some studies (Hamuda; 2001) confirm that sorghum has high percentage of macro elements, for that reason it recommended to be cultivated in the Gardoud soil and utilization of plant residue in efficient agricultural rotation improve the nutritional status of such as soil.
- The study has confirmed that plant ersidues of Drua, Bamia, and watermill could add elements to the simple soils.

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