

Quantities & Location of Calotropis Procera (Usher) Plant in Sudan

By:

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Key words : Calotropis procera , Shrub , Species , Zone

Abstract:

To estimate the quantity of Calotropis procera (Usher) plants in Sudan, a simple study is based on choosing random areas each of 4 square kilometers called a zone. The country is divided into 4 regions in this study, Namely North, East, West and Middle region. Each region is represented by 50 zones .Five cities in each region are chosen to represent that region. Each city is represented by 10 zones. Random samples of shrubs have been selected to study the mean length of the shrubs, the number of branches of each shrub to calculate the wood production in tons,the number of balls per shrub to calculate the total production of floss fibres and the number of seeds per ball to calculate the amount of oil and cakes that could be extracted from these seeds.

Readings are taken, analysed, discussed and results are obtained.

المخلص:

نبات العشر هو احد النباتات البرية التي تنتشر في كل انحاء السودان وفي أفريقيا وجزء من اسيا وامريكا اللاتينية وهو ينمو في شكل شجيرات صغيرة دائمة الخضرة ، اعدت هذه الدراسة لحصر العدد الكلي للشجيرات ثم متوسط طول الشجيرة و عدد الكرات و وزن الشعيرات بالكرة و عدد البذور في كل كرة . اعتمدت الدراسة على اختيار منطقة عشوائية مساحتها 4 كيلومترات مربعة ثم تم تقسيم القطر الى 4 مناطق كبيرة بحيث يمثل شرق السودان و وسط السودان و غرب السودان و شمال السودان و قسمت كل منطقة الى خمسين نطاقاً مساحة كل منها 4 كيلومترات مربعة من خلال ذلك اخذت القراءات و رصدت النتائج.

1- Introduction:

Calotropis procera (Usher) is a tree species that is widely distributed in Sudan. It grows as shrubs or small trees up to 3.5m high and has a yellow, brown or whitish grey thick corky bark. Leaves are opposite-decussate, pale green succulent, sessile or petiolate ovate. The fruit is green sub-globose to obliquely ovoid follicles (7-15cm long) with sticky spong inflated pericarp. The flowering period is from March to July⁽¹⁾.

Stem is usually simple, rarely branched, woody at base and covered with a fissured corky bark. The branches are somewhat succulent and densely white latex comes out when it is cut or broken.

It is multiflowered, umbellate cymes arising from the nodes and appearing axillary. The flowers are hermaphroditic and pentamerous.

The fruit is simple, fleshy, inflated, and up to 10cm or more in diameter. The seeds are numerous and flat of a silky white appearance⁽²⁾.

The native countries of the plant are Afghanistan⁽³⁾, Algeria, Burkina Faso, Cameroon⁽⁴⁾, Chad, Cot d'ivoire, Democratic Republic of Congo, Egypt, Eritrea⁽⁵⁾, Ethiopia, Gambia⁽⁶⁾, Ghana, Guinea-Bissau⁽⁷⁾, Iran, Iraq, Israel, Kenya, Kuwait, Lebanon, and Sudan⁽⁸⁾. This study is carried to draw the attention to this plant in Sudan. No end uses are registered up to now.

The quantities of this plant in Sudan are huge. This is the first study to magnify the importance of this plant by drawing the attention of the Sudanese economists to the high economic potentials of this plant.

As well the textile specialists should start researches to convert the valuable natural Usher fibres into woven and non-woven fabrics.

2- Materials and methods:

2.1-Study Area:

In this study areas each of 4 square kilometers are chosen and each area is called a zone. The Country (Sudan) is divided into 4 regions,

North, East, West and Middle. Each region is represented by 50 zones. Five cities in each region are chosen to represent the specific region. Each city is represented by 10 zones.

2.1.1 - Eastern Region:

In the Eastern region, the zones were taken randomly around Port Sudan, Kassalla, Elshoak, New Halfa and Elgadarif cities.

2.1.2- Western Region:

In the Western region, the zones were taken randomly around Kosti, Elobaied, Kadogly, Elnhood and Elfasher cities

2.1.3- Middle Region:

In the Middle region, some zones (30 zones) were taken randomly around Sinar, Khartoum and Omdurman cities, the other zones (20 zones) were taken in Eljazeera and Elbtana.

2.1.4- Northern Region:

In the Northern region, the zones were taken randomly around Shandi, Atbra, Abohamed, and Old Halfa cities.

Random samples of the usher plant (shrubs) have been selected for this study and the followings were measured:-

1. The mean length of the shrubs.
2. The number of branches of each shrub.
3. The number of balls per shrub.
4. The number of seeds per ball.

3- Results and Discussion:

Table (1) shows the average number of the shrubs per zone in each region. Random samples of shrubs per each region has been selected to measure the length of each shrub. The data were plotted on Figure (1). Table (2) shows the average length of the shrub and from the same samples the number of branches has been counted as shown on Table (3). The data of Table (2) are plotted on Figure (2) and that of Table (3) are plotted on Figure (3). The number of balls per each shrub has been

counted and the results are shown on Table (4) and plotted on Figure (4). As well the number of seeds per each ball has been calculated and the results are shown on Table (5) and plotted on Figure (5). Also the weight of the floss fibres of each ball has been calculated and the results are shown on Table (6) and plotted on Figure (6).

The Middle region has the largest number of shrubs per zone because plenty of water is available in this region while the Eastern region has got the smallest number of shrubs due to the rare availability of the water.

From Table (2) It is clear that the Western region has the longest shrub because of the sandy soil while the Eastern region has the shortest shrub with a length of 1.75 meter. Table (3) shows that the Western region has the largest number of branches per shrub while the Eastern region has the lowest.

Table (4) shows that the Northern region has the largest number of balls per shrub while the western region has the lowest. Table (5) shows that the Eastern region has the largest number of seeds per each ball while the western region has the lowest. This is a good Sign for the vegetable oil industry to be established in the eastern region to extract the oil from usher seeds. Table (6) shows that the western region has the largest weight of floss fibres per ball while the eastern region has the lowest.

Again this should encourage the industry of nonwovens to be established at the western region to use these amounts of usher fibres as inputs to this industry.

Usher plant is a drought-resistant and salt tolerant to a relatively high degree. It disperses the seeds through wind and animals. It quickly establishes as a weed along the degraded roadsides, lagoon edges and in the overgrazed native pastures ⁽⁹⁾. It dominates the areas of abandoned cultivation, especially the sandy soils and areas of low rainfall⁽¹⁰⁾.

Table (1)

The number of shrubs/zone

Areas	Aver. Number of the shrubs/zone
Middle	183
North	166
West	153
East	94

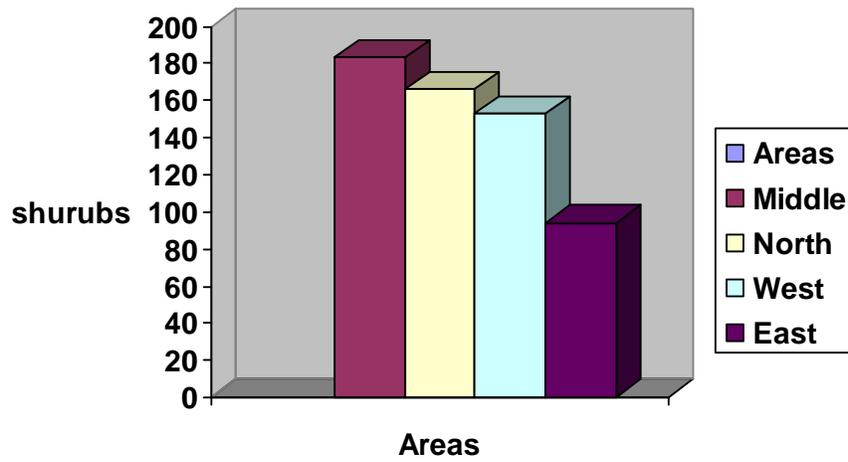


Fig.(1): Aver. number of the shrubs

Table (2)
The Length of the shrubs

Areas	Aver. Length of the shrubs in (cm)
West	218
North	203
Middle	185
East	175

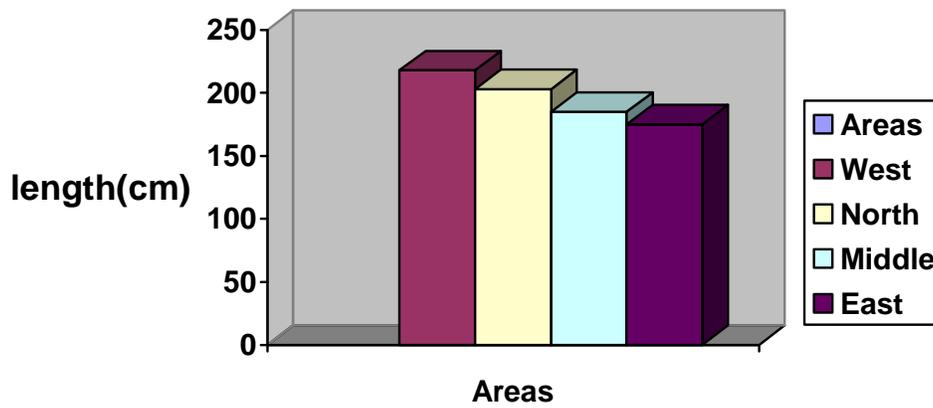


Fig. (2): Aver. length of the shrubs in cm.

Table (3)

The number of branches per shrub

Areas	Aver. Number of the branches per shrub
West	57
Middle	47
North	29
East	15

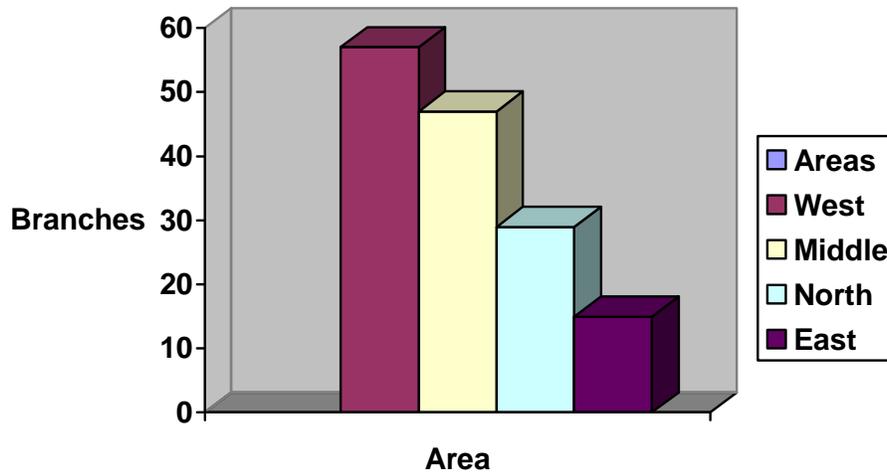


Fig.(3): Aver. number of the branches per shrub

Table (4)

The number of balls per shrub

Areas	Aver. Number of balls per shrub
North	111
Middle	100
East	96
West	85

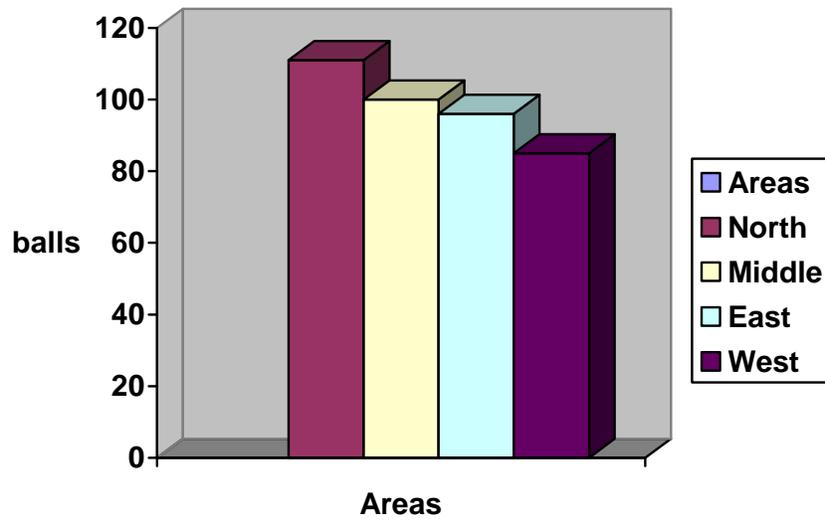


Fig.(4): Aver. number of balls per shrub

Table (5)

The number of seeds per each ball

Areas	Aver. Number of seeds per each ball
East	404
Middle	392
North	380
West	379

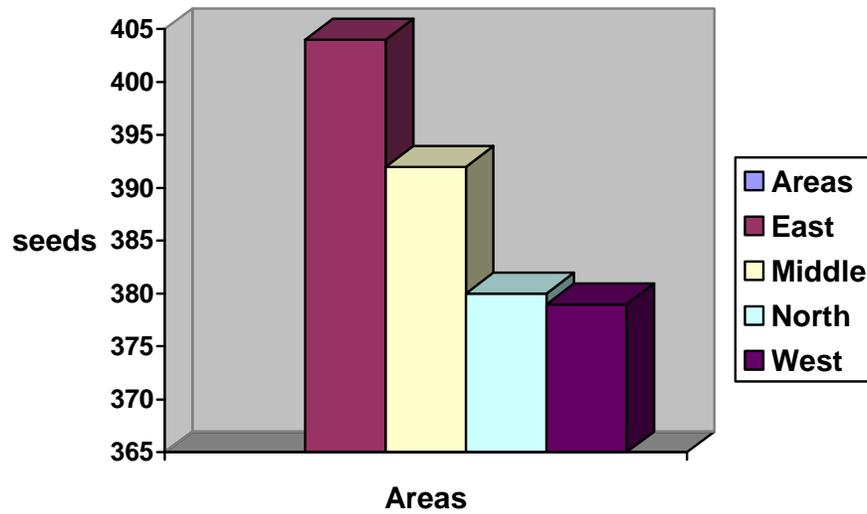


Fig.(5):Aver. number of seeds per each ball

Table (6)

The weight of fibres per ball (gram)

Areas	Aver. Weight of fibres per ball (gram)
West	2200
Middle	2070
North	2070
East	2000

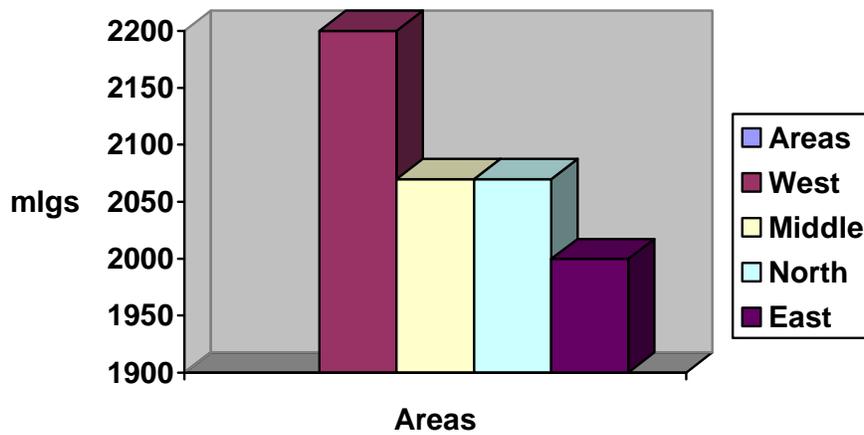


Fig.(6): weight of fibres per ball in (mg)

4- Conclusion

According to this study the total production of usher fibres, wood, seed oil and cakes can be easily calculated.

The ratio of shrub distribution in all zones is 0.0084% because the shrub has an area of 2.25m², therefore referring to FAO report⁽⁶⁾, the total forest area in Sudan is 41 million hectares and by simple calculation the total number of usher shrubs in Sudan is 1530666 shrubs. The average number of balls per shrub is 106 balls and the average weight of fibres per each ball is 2.08 grams. It is clear that the total production of fibres per year is about 337.4 tons.

The total production of wood is 166 tons, because one meter of usher stem weighed 15 g and the shrub has about 37 branches of an average length of 1.95 m.

Each 1000 seeds weighed 2.5g. Therefore, the total weight of seeds is 15.6 tons. Some experiments proved that usher seeds have 44% of its weight as oil. Then the expected extracted quantity of seed oil is 69 tons. Cake with light oil of unknown properties is about 88 tons. This plant has a high economical potentials in Sudan. The attention of the investors should be drawn to this plant. Industries of oil extraction, textiles, paper and wood could be established in Sudan according to this study.

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