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Quantities and Locations of Usher Plants in Sudan

Hashim Ali Salem and Mohammed Ahmed Ibrahim Algalib.
Department of Textile engineering, college of engineering, Sudan University of Science & Technology.

ABSTRACT: In order to estimate the quantity of ushers (*Calotropis procera*) plants in Sudan, a simple study, based on choosing random areas (zones) each 4 square kilometers, was conducted. The country was divided into 4 regions. namely North, East, West and Middle. Each region was represented by 50 zones. The total number of usher shrubs in Sudan was estimated to be 1530666. Estimated yields, of usher fibres wood, seed oil and cake were 166, 69 and 88 tons, respectively. The industrial and economic potentials of usher were pinpointed and discussed.

KEY WORDS : *calotropis procera , shrub , species , zone*

INTRODUCTION:

Calotropis procera (Usher) is a tree or shrub species that is widely distributed in Sudan. It grows up to 3.5 m 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 (7-15 cm long) with sticky spong inflated pericarp. The flowering period is from March to July [(1)]. The 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 cut or broken. It is multiflowered, umbellate cymes arising and appearing axially. The flowers are hermaphroditic and pentamerous. The fruit is simple, fleshy, inflated, and up to 10 cm or more in diameter. The seeds are numerous and flat with silky while pappi[(2).] The plant is native of Afghanistan, Algeria, Burkina Faso, Cameron, Chad, Cot d,ivoire, Egypt, Democratic Republic of Congo, Eritrea, Ethiopia, Gambia, Ghana, Guinea-Bissau, Iran, Iraq, Israel, Kenya, Kuwait, Lebanon, and Sudan[(2-12)].

The present study was conducted to draw attention to the plant in Sudan. No end uses have been registered up to date. 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 possible high economic potentials of the plant. and the textile specialists to start research to convert the valuable natural Usher fibres into woven and non-woven fabrics**.**

MATERIALS and METHODS

The country (Sudan) was divided into 4 regions, North, East, West and Middle. Each region was represented by 50 zones. Five cities in each region were chosen to represent the specific region. Each city was represented by 10 zones 4 square kilometers each, selected randomly. In the Eastern region, the zones were taken around Port Sudan, Kassalla, Elshoak, New Halfa and Elgadarif cities. In the Western region the zones were taken

around Kosti, Elobaied, Kadogly, Elnhood and Elfasher cities. In the Middle region, 30 zones were selected around Sinar, Khartoum and Omdurman cities. The other zones(20) were taken in the Gezira and Elbtana. In the Northern region, the zones were taken around Shandi, Atbra, Abohamed, and Wade Halfa cities. Random samples of the usher plant (shrubs) were selected in each zone and mean length of shrubs, number of branches per shrub, number of balls per shrub and number of seeds per ball were measured.

RESULTS and DISCUSSION:

Table I and Figure 1 show the average number of shrubs per zone in each region. Table 2 and Figure 2 show the average length of the shrub. The number of branches per shrub was counted and shown in table 3 and Figure 3. The number of balls per shrub was counted and the results are shown in table 4 and figure 4.

The number of seeds per each ball was calculated and the results are shown in table 5 and plotted in figure 5. Also the weight of the floss fibres of each ball was calculated and the results are shown in table 6 and plotted in figure 6.

The Middle region had the largest number of shrubs per zone because plenty of water is available in this region while, the Eastern region had the smallest number of shrubs due at least in part, to the dryness of the region.

From table 2 it is clear that the Western region had the tallest shrub because of the sandy soil while the Eastern region had the shortest ones with a length of 1.75 m. Table 3 shows that shrubs in the Western region had the largest number of branches per shrub while in the Eastern region they had the lowest.

Table 4 shows the that shrubs in the Northern region had the highest number of balls per shrub while the Western region had the lowest. Table 5 shows that the Eastern region had the highest number of seeds per ball while the western region had the lowest. This finding showed the possibility of a good opportunity for vegetable oil industry to be established in the Eastern region to extract oil from usher seeds. Table 6 shows that the Western region had the largest weight of floss fibres per ball while the Eastern region had the lowest.

This finding should encourage the industry of nonwovens to be established in the Western region to use usher fibres as inputs. Usher plant is drought-resistant and salt tolerant to a relatively high degree. Seeds are dispersed by wind and animals.

The plant quickly establishes as a weed along degraded roadsides, lagoon edges and in overgrazed native pastures [(4)]. It dominates abandoned and non-cultivated land, especially sandy soils and areas of low rainfall.

Table 1: Number of shrubs per zone

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

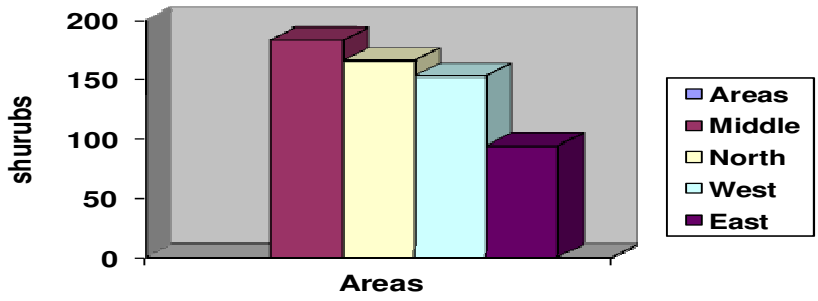

Figure 1. Average number of shrubs per

Table 2. Average length of shrubs as influenced by location

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

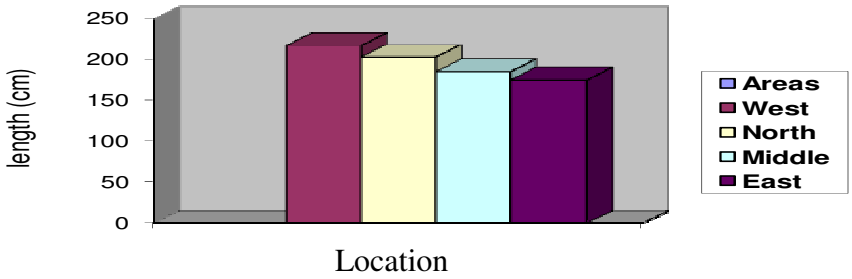

Figure 2: Average length of shrubs in *as influenced by location*

Table 3: Number of branches per shrub as influenced by region

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

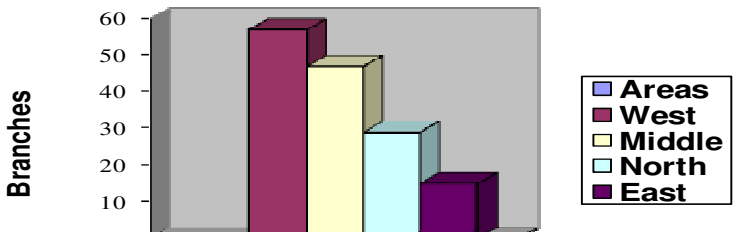

Figure. 3: Average Number of branches per shrub as influenced by region

Table 4: Number of balls per shrub as influenced by region

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

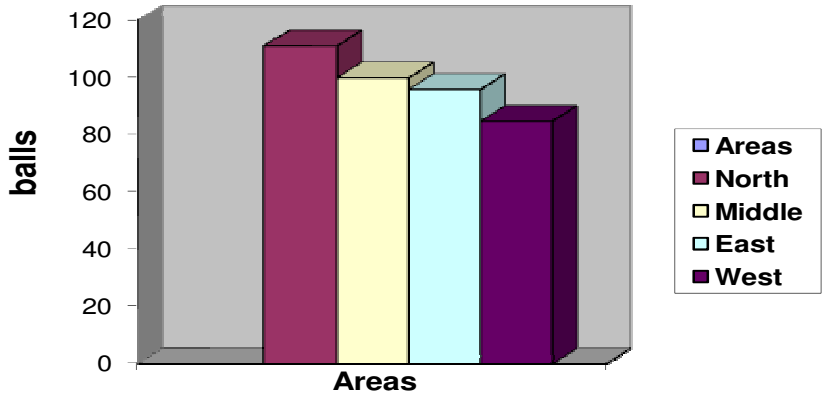

Figure 4: Average Number of balls per shrub

Table 5: Number of seeds per ball

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

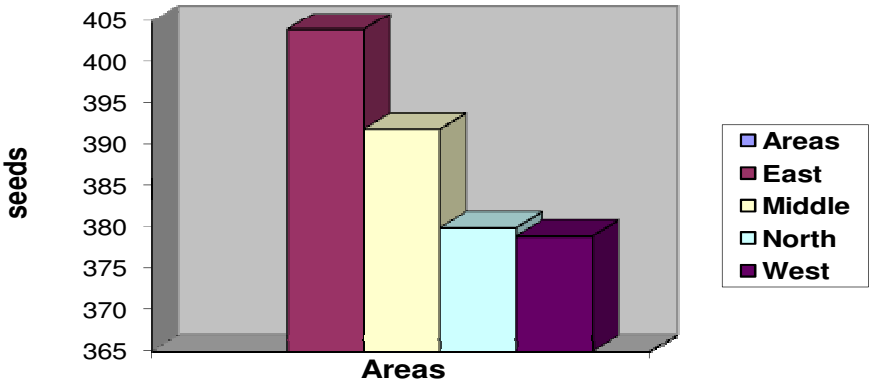

Figure 5: Average. number of seeds per ball

Table 6: Weight of fibres per ball (mg)

Region	Aver. Weight of fibres per ball mg
West	2200
Middle	2070
North	2070
East	2000

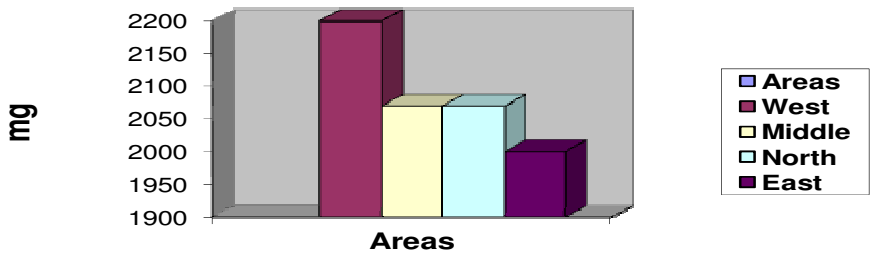

Figure. 6: Weight of fibres per ball (in mg)

CONCLUSION:

From the results obtained, the total production of usher fibres, wood, seed oil and cakes can be calculated.

The ratio of shrub distribution in all zones was 0.0084% because each shrub occupies an area of 2.25m², therefore referring to FAO report[8], the total forest area in Sudan is nearly 41 million hectares and by calculations the total number of usher shrubs in Sudan could be estimated to be 1530666. The average number of balls per shrub is 106 and the average weight of fibres per each ball is 2.08 g. 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 weighs about 15 g and the shrub has about 37 branches of an average length of 1.95 m. Each 1000 seeds weigh 2.5g. Therefore the total weight of seeds is 156 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. The present study showed clearly that usher plants have high economical potentials to which investors attention should be drawn. Profitable industries of oil extraction, textiles, paper and wood could be established.

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