



الهيئة العلمية لشؤون الزراعة والثروة السمكية

دراسة وتقييم النمو لخمس أصناف من نبات الفيتيفار صنف (Vetiveri zizanioides L)

تحت الظروف البيئية لدولة الكويت



٣- دراسة وتقييم النمو لخمس أصناف من نبات الفيتيفار صنف

(*Vetiveri zizanioides L*) تحت الظروف البيئية لدولة الكويت

القائمون على التجربة:

- سوسن السالم : رئيس قسم بحوث البستنة والزراعة المحمية

- سانجيف كوروب : أخصاصي تنمية زراعية

- شيماء الخباز: محلل عينات زراعية

- تهاني العتيبي: محلل مبتدى عينات زراعية

ملخص:

تهدف هذه التجربة إلى دراسة احتياجات الفيتيفار من المياه والمواد الكيميائية،

كما يتم دراسة إمكانية زراعة الفيتيفار تحت الظروف البيئية لدولة الكويت.

مقدمة:

الفيتيفار عبارة عن نبات ينمو على مدار السنة، الصنف الأكثر شيوعاً هو

Vetiveria zizanioides ، وهو عبارة عن نبات عطري يزرع في الهند. تستخدم

جذور هذا النبات لصناعة الأدوية و العطور وهذا النبات يوجد في المناخ الدافئ و

ينمو في المناطق التي يصل إرتفاعها إلى أكثر من ٦٠٠ متر، كما ينمو الفيتيفار في

جميع أنواع التربة الغنية بالعناصر الغذائية و التي ترشح الماء باعتدال لكن يكون

أفضل نمو في الطفل الرملي. و الأمطار الموسمية المناسبة تصل تقريباً من ١٠٠

إلى ٢٠٠ سم، و درجة الحرارة تتراوح من ٢٥ ° م إلى ٤٠ ° م، كما أن الرطوبة المعتدلة ضرورية لنمو النبات. الشهر الملائم لزراعة النبات هو شهر مارس و إبريل.

المواد وطريقة الزراعة:

- * يتم إكثار هذا المحصول عن طريق الشتلات.
- * يتم إزالة الأعشاب الضارة و قلب التربة للتهوية بصفة مستمرة.
- * يتم عمل شفة مرتفعة في الأرض المحروثة بالطول المناسب.
- * بعدها تزرع الشتلات بصفين عرض كل منها متر واحد.

المعاملات الزراعية :

- * غالباً يستخدم ٥ طن/هكتار من FYM أو compost (مزيج من روث و أوراق شجر جافة لتسميد الأرض) في وقت تمهيد التربة.
- * وجد أن استخدام ٢٢,٥ كغم من P_2O_5 و K_2O مفيد لنمو الجذور و إنتاج الزيت.

النتائج والمناقشة:

- * أفضل فترة لحصاد الجذور والحصول على أعلى إنتاج هي فترة ١٨ شهر.
- * بعد الحصاد يتم غسل الجذور جيداً لإزالة الأتربة و يقطع لقطع يتراوح طولها من ٤ إلى ٥ سم .
- * وبعدها يستخلص الزيت عن طريق عملية التقطير المائي.

References

- Cheng,K.,Hu,G.Q., Rao,H.M., Xu, L.H.,and Wu, H.Q., 1994 Ecological effects of planting vetiver grass in citrus groves on slopping red soil fields. *Acta Ecologica sinice* 14(3):21-25
- Zhang,J.1998 Vetiver grass planted on the Aeolian sands of Pingtan Islands and its application. In;L.yu Xu(ed) *Vetiver Research and development*.pp179-191. China Agricultural Scien Tech Press, Beijing

صور توضيحية:



١. منظر عام للنباتات الفيتيفار المزروعة.



٢. شتلة الفيتيفار.



٣. شتلة الفيتيفار قبل الإنبات.



٤. بداية إنبات شتلة الفيتيفار.



٥. منظر عام لحقل الفيتيفار بالرابية.



٦. نباتات الفيتيفار في مرحلة تطور النمو.



٧. نباتات الفيتيفار في مرحلة التزهير.



٨. جذور نباتات الفيتيفار.

Vetiver (*Vetiveria zizanioides* L) an eco-friendly grass for the Middle East

ABSTRACT

A research project, unique of its nature in the middle east, was undertaken to find out the adaptability of Vetiver grass (*Vetiveria zizanioides* L Nash) now renamed as *Chrysopogon zizanioides* L Roberty) under extreme climatic variations, such as prolonged summer for seven months, short winter for five months, extreme temperature variations from 4°C to 55°C, high soil salinity ranging from 3000 ppm to 8000 ppm and pH ranging from 6.5 to 8.5 prevailing in Kuwait.

Experiment Team:

Sausan Muhammed Al Salem

Sanjeev S Kurup

Shyma Ali Al Khabbas

Tahani Al Otaibi

Introduction

Kuwait is a small country with a surface area of 17818 km² located at the head of the Arabian Gulf. There are 12479 km² of sandy desert and desertified lands in Kuwait. The low lying desert land is mainly sandy and barren. Due to scarce water resources and harsh climatic conditions, the total cultivated area is limited to 10730 ha out of a total cultivable area about 143000 ha. The two major agricultural areas in this country are Al Wafra that borders with Saudi Arabia in the south and Al Abdali that borders with Iraq in the north.

Kuwait receives about 141.2 mm rainfall per year and it falls from October to April. Sudden cloudbursts are common from October to April. It usually brings inordinate amounts of rain which can damage the crops in the open field. More over the rain water will not easily percolate down due to the hard Gatch layer lying at various depths of 1.5 m to 3 m at different places causing soil and water erosion. Sand storms and dust storms occur throughout the year, but are most common between March and August which in turn damages the cooling systems of Green houses due to sedimentation.

Hence, desertification and soil erosion are the hazards that need to be controlled and checked. Experimental findings in various countries proved that Vetiver grass can be very effective in controlling these hazards. Now Vetiver grass technology is effectively used in sand fixing at beaches and river banks for highway embankment protection. However, the adaptability of this pioneer grass in tropical areas like Kuwait has not been established so far. Therefore an experiment was launched in Public Authority of Agriculture Affairs and Fish Resources, the main institution responsible for Agriculture development in Kuwait .

Materials and Methods

The experiment was laid out at Al Rabiya Kuwait in November 2006 where the soil is sandy loam in nature. Basic condition of the experiment site is furnished in Table.1. Five Indian cultivars of Vetiver, made available by Mr.R.C. Suresh Golden Fries Ltd Coimbatore were used as treatments. The maximum and minimum temperatures during the cropping period up to October were 54⁰C and 4⁰C respectively as shown in Table 2. The experiment was laid out in Completely Randomized Design with five treatments and four replications. Mature tillers from Vetiver clump were used for planting. Each slip was dipped in cow dung slurry before planting. The slip so planted during the onset of winter in Kuwait had a minimum of two tillers. The slips were planted at a spacing of 60 x 75 cm.

The irrigation was given through drip irrigation system for 10 minutes daily during summer months. Third stage treated waste water having a pH 6.5-7.5, EC 1100-2200 Mmhos/cm, nitrogen 10 to 20 ppm and phosphorus 0.5 to 10 ppm was used for irrigation. Organic manure in the form of Avicumis was applied @5t/ha. Phosphorus and Potash @ 22.5 Kg/ha each was given through irrigation water.

Results and Discussion

Due to the low temperature that prevailed at the time of planting the top shoots died back. However its underground growing points survived and resumed growth after four months when weather became warm and favorable. Cheng et.al (1994) have pointed out that Vetiver grass started to grow when daily mean temperature reached 10-15⁰C or higher, and entered fast growing period at 20-30⁰C or more. The Vetiver grass grew normally on sandy loam soils of Kuwait. In coastal areas the grass can tolerate and grow well on saline land affected by sea water (Zhang, 1998).The grass attained full maturity nine months after planting. All the five varieties tried attained a height of 160 cm above ground level. However, they appeared a little poorer in their later growth phase with red tips in their leaves. This might be related to P and Fe deficiency. No significant difference in the length of root was observed. The roots had extended up to a depth of 1.5 m forming very good ground coverage. Flowering started 8 to 9 months after planting. The fresh weight of the green leaves per clump was 13 kg and the roots 4 kg. A maximum of 300 to 400 tillers per clump of the grass were noticed eleven months after planting. But the peak tillering was observed in August-September months. No pests and diseases were detected during the entire growth stage.

The grass established well within a short span of nine months on sandy loam soils under extremely adverse conditions. The present experiment confirmed that Vetiver is really a wonder grass which can grow well in subtropical deserts with very little nutrients, attaining a height of 160 cm, producing tillers as many as 320 slips/clump and rooting to a depth of 150 cm in just one growing season after planting.

Conclusion

The experimental findings revealed that the only limiting factor in the Vetiver growth might be the lack of nutrients especially phosphorus and iron which made the Vetiver leaf tips withered and red. Research elsewhere, for example in India, shows that Vetiver grasses with their developed root system and vigorous growth could be used to prevent soil and water erosion effectively. However in this desert area a lot of research and demonstrations are required to find out the effectiveness.

Acknowledgement

The authors have extended sincere thanks to Dr.Paul Truong of the Queensland Department of Natural Resources for his effort in reviewing and editing this paper.

References

- Cheng,K.,Hu,G.Q., Rao,H.M., Xu, L.H.,and Wu, H.Q., 1994 Ecological effects of planting vetiver grass in citrus groves on slopping red soil fields. *Acta Ecologica sinice* 14(3):21-25
- Zhang,J.1998 Vetiver grass planted on the Aeolian sands of Pingtan Islands and its application. In;L.yu Xu(ed) *Vetiver Research and development*.pp179-191. China Agricultural Scien Tech Press, Beijing

Experiment Photos:



Plate.1 General view of vetiver slips planted



Plate.2 Vetiver clump



Plate.3 Vetiver slips

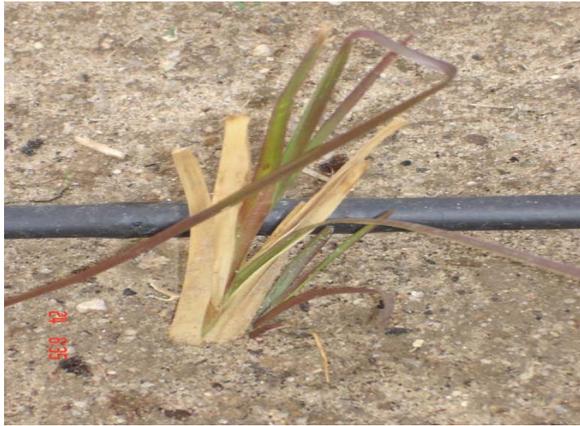


Plate.4 Vetiver slips started growing



Plate.5 View of Vetiver plot in Rabiya



Plate.6 Vetiver in active growing stage



Plate.7 Vetiver in Flowering stage



Plate.8 Roots of Vetiver