COLD TOLERANCE OF
VETIVER GRASS

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INTRODUCTION

In Australia, Vetiver growth was not affected by severe frost at –14°C ground temperature. It survived for a short period at –22°C (-8°F) in northern China.

In Georgia (USA), Vetiver survived in soil temperature of -10°C but not at –15°C. Research showed that 25°C was optimal soil temperature for root growth, but Vetiver roots continued to grow at 13°C at the rate of 12.6cm/day, indicating that Vetiver grass was not dormant at this temperature. Extrapolation suggested that root dormancy occurred at about 5°C.

Vétiver dies when the ground is frozen.
SOME EXAMPLES

- Survival of Vetiver under snow, field conditions
- Survival of Vetiver under severe frost under field conditions
- Survival of Vetiver under snow in pot trial
- Vetiver growth in cold and frost under field conditions
- Research results on the effect of low temperature on Vetiver shoot and root growth
Los Angeles mountain on the Chilean Andes (Latitude 38 º South)

Vétiver was covered by snow for 2 months during winter.

Regrowth after winter in the first year. Better growth could be expected in later years.
Severe frost (-14°C on ground surface) stopped shoot growth in winter in Australia.

Regrowth after 3 months in spring.
Severe and frequent frost on Australian Highland

Summer growth
Top growth was killed during one of the most severe winters on record with 64 frosts and ground temperature at -14°C.
Top growth was completely dried up
Thick canopy insulated and protected young shoots in winter.
Vetiver recovered and resumed vigorous growth early in spring
Summer growth at same site
A simple trial was conducted by D. Rachmeler in January, 2015.

1- On the first occasion, vetiver was covered by 35cm of snow for 4 days.

2- A second snow period, 5 weeks later, vetiver was covered by 18cm of snow.

On both occasions, night temperatures was -3 degrees C and 3C during the day.
Snow cover

First occasion

Second occasion
For control one pot was taken indoor during snow periods.
Vetiver taken indoor as control

Vetiver under snow

Vetiver appearance after snow periods
Trimming after snow periods showing all the pots looked exactly the same with no difference between the pot taken inside versus those pots left outside.
Vetiver Growth In Winter Under Field Conditions

Under field conditions, when air temperature gradually drop with the onset of winter, Vetiver growth was also affected.

One obvious and peculiar sign is its leaves gradually turn purplish red in colour, a typical reaction of Vetiver under stress. This can be low temperature, water stress, high salinity, extreme pH and other toxic materials.

Purple colour on leaves is a typical symptom of P deficiency in most crop and orchard plants, but not necessary with Vetiver.

In thick sward, growth was not severely affected by low temperature, it remained active, as it was protected by outer layers.
Frosted vetiver with purple-red leaves in winter in Australia
Frost only affected plant tops and the outside plants of thick sward, the inside plants were still green and active.
Frosted vetiver leaves with purple-red colour

Red leaf tips and flower

Half red on the same leaf
The growth characteristics of vetiver were studied in the phytotron by Dr. Yue-Wen Wang of National Taiwan University.

On average, at temperature above the 25°C, daily root growth of 3 cm was recorded.

Although very little shoot growth occurred at the soil temperature range of 15°C (day) and at 13°C (night), root growth continued at the rate of 12.6cm/day, indicating that Vetiver grass was not dormant at this temperature. Extrapolation suggested that root dormancy occurred at about 5°C (Fig.1).
**Genotypes:** VVZ008-18, Ohito, and Taiwan, the latter 2 are basically the same as Sunshine.
Small portable plastic house can be used to cover the planting in winter,
These slides show Vetiver can survive very cold winter, it dies when the ground is frozen. When frosted or under snow cover the outside plants of the thick sward protect the interior part, which remains green and actively treating effluent. Normally disposal rate under these conditions is reduced by half.

To overcome this a small portable plastic house can be used in winter to cover the planting.

THANK YOU