

**Number 21 July 2002**

**Editorial**

**Vernacular Names of Vetiver**

Originated in tropical Asia, vetiver has been introduced to many parts of the world for use in soil and water conservation as well as for other purposes, such as for pollution control, heavy-metal and toxic-substance absorption, essential-oil extraction, land demarcation, roof thatch, mulching, mushroom growing, landscaping, etc. In countries where vetiver is grown and utilized, local people call it by their own local languages or dialects. These names, known as *vernacular* or *local names*, are used either in small localities of the minority peoples, or in large areas of the whole countries.

Vernacular names are more preferable in general articles, and are also useful in local communications. In scientific writing, however, scientific names must be used to avoid confusion since they are the ones that are used universally. Vernacular name can be mentioned in association with its scientific name(s) and common name(s), to make the article complete.

In the article that immediately follows this Editorial, vernacular names of vetiver have been compiled by the Editor from various sources whose origins are too numerous to mention in this short communication. In most cases, they have been rechecked by the scientists of the countries of origin, although some may still be wrong in their spelling, especially where there is no standard system of transcription of local languages into Roman letters; thus a given name may be written in many different spellings. Although every attempt has been made to obtain as much as possible all vernacular names used in all vetiver-growing countries, the present list is still far from complete. Thus, readers are requested to send in their contributions for additional names, especially those used by the minority peoples in different dialects, or in countries/dialects which are still missing in the article which follows, in order to make the list as complete as possible. Corrections on the spelling of vernacular names and the dialects/languages of the present list will also be greatly appreciated. Any additions/suggestions (e.g. most commonly used vernacular names) to the present list are also most welcome.

**Vernacular Names of Vetiver\***

A given plant, or any other living creatures, can be called by three names, viz. *Common name*, *scientific name*, and *vernacular* or *local name*.

**Common Name:** This is the name that is used by the laymen. As English is the world's most popular language, most literature uses the English common names as standard names for all plants

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\* By Narong Chomchalow, Coordinator, Pacific Rim Vetiver Network; and Editor, *Vetiverim*

although many names in other languages can also be used as common names if they are well known by those names. 'Vetiver' is a universal (English) common name of a few species of grasses in the genus *Vetiveria*. Khus or khou khus is common name of vetiver used in many countries in South Asia. It is a custom that when a given name is used as the common name of a plant, the first letter is not capitalized (thus vetiver, not Vetiver), except when it starts the sentence, or derives from proper noun like the name of a person or place, e.g. McArthur palm, French bean

**Scientific Name:** This is the name used in biology based on taxonomic description using the binomial system of classification which consists of generic name (i.e. genus) and specific epithet (i.e. species). In the genus *Vetiveria* to which all 11 known species of vetiver belong, two species that are commonly used for soil and water conservation are *V. zizanioides* (L.) Nash (lowland vetiver) [synonyms: *Andropogon muricatus* Retz., *A. squarrosus* Hook.f. non Linn.f., *Anatherum zizanioides* (Linn.) Hitchcock & Chase] and *V. nemoralis* A. Camus (upland vetiver); both are of Asian origin. A third species, *V. nigrimana*, and African species, is also used to some extent for soil and water conservation in the African continent.

**Vernacular or Local Name:** This is the name of a given plant used by native people in any locality. A given plant may have many vernacular names in different localities; *vice versa*, a given vernacular name may refer to two or more species of plants.

Most vernacular names of vetiver apply to *V. zizanioides*. In Thailand where another species, *V. nemoralis*, is also found, there is a distinction of vernacular names of both species. In Africa, all vernacular names of vetiver apply to *V. nigrimana*.

The list below gives the name of the country (in ***bold italics***) where vetiver is grown or known to exist. Vernacular names are given after the language or dialect, which is written in *italics*; all names are arranged in alphabetical order. Vernacular name(s) most commonly used in a given country is/are underlined. To make the list of vernacular names uniform, the first letter of every word of all names is capitalized as if it were a proper noun. A comma (,) is used to separate vernacular names. Compound names are not hyphenated, but written as two or more words, e.g. Gondha Bena, Khus Khus, Xiang Geng Chao, Vala Khas Khas.

***Bangladesh:***

*Bengali:* Bangla, Benna Shoba, Binna Sopha,

Ghonda Bena, Gondha Bena, Ecorban, Ecorbon, Khus Khus

***China:***

*Cantonese:* Hang Gen Cao

*Mandarin:* Xiang Gen Cao

**Ethiopia:**

*Amharic:* Yesero Mekelakeya

**Fiji:**

*English:* Vetiver

**Ghana:**

*Dagomba:* Kulikarili

**India:**

*Ayurvedic:* Ushira

*Bengali:* Khas, Khas Khas, Khus, Khus Khus

*Gujarati:* Valo

*Hindi:* Bala, Balah, Bena, Ganrar, Khas, Khas

Khas, Panni

*Kannada:* Hallu, Kaadu, Karidappasajje Hallu,

Laamancha, Laamanche, Lavancha, Vattiveeru,

*Malayalam:* Ramacham, Ramachehamver, Vettiveru

*Marathi:* Vall, Vala Khas Khas

*Panjabi:* Panni

*Sanskrit:* Abhaby, Amrinata, Sugandhimulu, Ushira

*Santhali:* Sirom

*Telugu:* Ayurugaddiveru, Kuruveeru, Lamajja-ksmubrtu, Vettiveellu, Vattiveeru, Vettiveerum,

Vidavaliveru

*Tamil:* Ilamichamver, Vettiver, Vettiveru,

Vilhalver, Viranam

*Urdu:* Khas

**Indonesia:**

*Bahasa:* Agar Wangi, Lara Setu, Lara Westu,

Rara Weatu, Rumpu Wangi

*Batak:* Hapias

*Bugis:* Sere Ambong

*Buol:* Akadu

*Gayo:* Useur

*Gorontalo:* Tahele

*Halmahera:* Babu Wamendi

*Jawa:* Lara Setu

*Madura:* Kara Bistu

*Minagkabau:* Urek Usa

*Roti:* Nausina Fuik

*Sundanese:* Janur, Nara Wastu, Usar

*Ternate:* Garama Kusu Batawi

*Tidor:* Barama Kusu Butai

***Iran:***

*Persian:* Bikhiwala, Khas

***Laos:***

***Laotian:*** Ya Faek

***Latin America:***

*Spanish:* Capia, Mora, Pasto Vetiver, Tiva,

Zacate Valeriana, Zacate Vetiver, Zacate Violet(t)a

***Malaysia:***

*Bahasa:* Akar Wangi, Kusu Kusu, Naga Setu,

Nara Setu, Nara Wastu, Rumput Wangi

***Nepal:***

*Nepalese:* Kas, Khas Khas

***Nigeria (and North African Countries Across Sub-Saharan belt):***

*Fulani:* Chor'dor'de, Ngongonari, So'sornde, So'mayo, Zemako

*Hausa:* jema

***Pakistan:***

*Arabic:* Khas

*Urdu:* Aseer, Daron, Khas

***Philippines:***

*Talalog:* Mora

?: Amoor, Amoras, Amoras, Anias de Moras, Giron, Ilib, Moras, Moro, Muda, Narawasta, Raiz de Moras, Rimodas, Rimora(s), Tres Mora

***Puerto Rico:***

*Puerto Rican?:* Pacholi, Pachuli

**Sahel:**

*Bamabara:* Babin, Ngoka Ba, Ngongon

*Fulani:* Dimi, Kieli, Pallol

*Gurma:* Kulkadere

*Mossi:* Roudoum

*Sarakolle:* Kamare

*Songhai:* Diri

**Senegal:**

*Bamabara:* Khamara

*Fulani:* Toul

*Poulaar:* Sodorde

*Tukulor:* Semban

*Wolof:* Sep, Sepp, Tiep

**Sierra Leone:**

*Mende:* Pindi

*Susu:* Barewali

*Temne:* An-wunga Ro-gban

**South Africa:**

*Zulu:* Muskus

**Sri Lanka:**

*Sinhalese:* Saivandera, Savandara, Savandramul

**St. Vincent:**

*English:* Khus Khus (originated from South Asian Dialects, viz. Bengali, Hindi, or Urdu)

**Togo:**

*Dagomba:* Kulikarili

**Thailand:**

*Vetiveria zizanioides:*

*Central and Nakhon Ratchasima:* Ya Faek Hom

*Central:* Faek Lum, Faek Hom, Ya Faek, Ya Khom Faek,

*General (all over the country) :* Faek

*Kamphaeng Phet:* Faek Ko Takhrari, Saeng Mong

*Karen – Mae Sariang:* Po Sia Khi

*Nakhon Phanom*: Faek Som, Faek Tham

*Northeastern*: Kaeng Hom, Khaem Hom

*Vetiveria nemoralis*:

*Central*: Faek Don

*Chiang Mai*: Ya Faek

***Vietnam***:

*Vietnamese*: Huong Bai\*, Huong Lau\*

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\* According to Ken Crismier <kencris@gte.net> , these two vernacular names are not used for vetiver; they are used for other grasses. There is no Vietnamese vernacular name for vetiver.

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**It is interesting to note the following:**

1. Names that signify *fragrance/fragrant* in the root of *V. zizanioides* are:

*Bhasa (Indonesia and Malaysia)* : ‘Wangi’ means fragrant, as in ‘Akar Wangi’ which means fragrant root, and ‘Rambut wangi’ which means fragrant grass.

*Thai*: ‘Hom’ means fragrant, as in ‘Faek Hom’ which means fragrant vetiver, and ‘ya Faek Hom’ which means fragrant vetiver grass.

*Cantonese*: ‘Hang’ means fragrant, as is ‘Hang Gen Cao’ which means grass with fragrant root (‘Gen’ means root, and ‘Cao’ means grass).

*Mandarin*: ‘Xiang’ means fragrant, as in ‘Xiang Gen Cao’ which means grass with fragrant root (‘Gen’ means root, and ‘Cao’ means grass).

*Vietnamese*: ‘Huong’, as in ‘Huong Bai’ and ‘Huong Lau’, meaning fragrant grass. (see \* above)

2. Names that signify being a *grass* are:

*Bhasa (Indonesia and Malaysia)* : ‘Rumput’, as in ‘Rumput Wangi’, meaning fragrant grass.

*Cantonese*: ‘Chao’, as in ‘Hang Gen Chao’, meaning grass with fragrant root.

*Laotian*: ‘Ya’, as in ‘Ya Faek’ meaning vetiver grass.

*Mandarin*: ‘Chao’, as in ‘Xiang Gen Cao’, meaning grass with fragrant root.

*Thai*: ‘Ya’, as in ‘Ya Faek’ meaning vetiver grass, ‘Ya Faek Hom’, meaning fragrant vetiver grass, ‘Ya Khom Faek’ meaning vetiver grass with sharp-edged leaves.

3. Same dialects/languages used in different countries:

*Bahasa*:

***Indonesia***: Agar Wangi, Lara Setu, Lara Westu, Rara Weatu, Rumput Wangi

***Malaysia***: Akar Wangi, Kusu Kusu, Naga Setu, Nara Setu, Nara Wastu, Rumput Wangi

*Bengali:*

**Bangladesh:** Bangla, Benna Shoba, Binna Sopha, Ghonda Bena, Gondha Bena, Ecorban, Ecorbon, Khus Khus

**India:** Khas, Khas Khas, Khus, Khus Khus

*Dagomba:*

**Ghana:** Kulikarili

**Togo:** Kulikarili

*Fulani:*

**Nigeria:** Chor'dor'de, Ngongonari, So'dornde, So'mayo, Zemako

**Sahel:** Dimi, Kieli, Pallol

**Senegal:** Toul

*Thai/Laotion (both languages are similar):*

**Laos:** Ya Faek

**Thailand:** Ya Faek, Ya Khom Faek, Faek Hom, Faek Don, Faek Lum

*Urdu:*

**India:** Khas

**Pakistan:** Khas

4. Same names in different dialects in different countries:

Khas:

*Arabic (Pakistan)*

*Hindi (India)*

*Persian (Iran)*

*Urdu (India and Pakistan)*

Khas Khas:

*Bengali (India)*

*Hindi (India)*

*Marathi (India)*

*Nepalese (Nepal)*

5. It can be deducted from the above that *vetiver is truly an ancient plant* for the simple ethno-botanical reason that it possesses so many vernacular names in different dialects/languages in different countries. It is rather strange that the original Tamil word, 'vettiveru' (meaning a coarse grass), in which the English

common name, 'vetiver', and the generic name, *Vetiveria*, are derived, is not as popularly used as the other South Asian words, namely Khas, Khas Khas, Khus, and Khus Khus.

6. The present list is still far from complete. The readers are cordially invited to provide additional names, or make corrections, in order to make the list as complete and correct as possible.

### **Descriptors for Vetiver<sup>@</sup>**

Vetiver plant (*Vetiveria zizanioides* L. Nash), a native grass of India, occurring wild in south-east Asia and all other pantropical regions of the world, has been extensively used for land protection and production of essential oil used in perfumery industry. Lately, Vetiver System (VS) has found diversified uses in conservation and reclamation of soil and water, and promises multifarious eco-friendly industrial applications (Lavania and Lavania 2000. Cjp,cja;pw amd Baramg 2002). On account of its vast ecological niche this species is known to withstand extreme ranges of temperature, humidity and soil regimes, suggesting the occurrence of tremendous diversity and adaptability in its form and function. Therefore, keeping in line with current biodiversity regime, it is necessary that due efforts are made to characterize and document the natural diversity present in this species in order to establish core collections for facilitating specific applications of the VS. This can be best done if the diverse accessions are duly characterized using standard descriptors, and maintained accordingly in field/seed/tissue genebanks for sustainable utilization. As such, the present communication is intended to provide the "Descriptors for Vetiver" on four major aspects: Passport, Management, Environmental Regime and Botanical Characterization. Although the coding provided here cannot be treated as definitive and absolute, but an effort has been made to make it as comprehensive as possible with respect to all the parameters of variation known to be naturally occurring in vetiver in particular, and other related tufted grasses in general. This enumeration is based on personal observations of the author as well as floristic and literature survey. A standard format used by the International Plant Genetic Resources Institute (IPGRI), Rome, has been followed for the purpose. The highly discrimination descriptors are marked with asterisk (\*), especially suitable for the users of genetic resources, and other details would have value in micro-level inventerization and elucidation of evolutionary variation. For color traits the standard color codes of the Royal Horticultural Society (RHS) are to be used to denote color descriptor states. It is hoped that the Descriptors would be useful to the curators/users of plant genetic resources to facilitate management, maintenance, value added identification, and utilization.

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## PASSPORT

### 1. Accession Data

- 1.1 Accession number
- 1.2 Donor name
- 1.3 Donor identification number
- 1.4 Other number(s) associated with the accession
  - 1.4.1 Other number 1
  - 1.4.2 Other number 2
- 1.5 Scientific name\*
  - 1.5.1 Genus: *Vetiveria*
  - 1.5.2 Species: *V. zizanioides* (Also *V. nemoralis*, *V. nigrimana*, *V. lawsonii*, etc.)
  - 1.5.3 Subspecies
  - 1.5.4 Botanical variety
  - 1.5.5 Authors: Linnaeus, Nash.
- 1.6 Pedigree: Parentage or nomenclature and designation assigned to breeder's material\*
- 1.7 Cultivar name: either a registered/other formal cultivar/area ecotype\*
- 1.8 Acquisition date
- 1.9 Date of last regeneration or multiplication
- 1.10 Number of times accession multiplied
- 1.11 Number of plants used in each multiplication
- 1.12 Type of maintenance\*
  - a) Vegetative
  - b) Seed
  - c) Both
  - d) Tissue culture: From Leaf sheath base/inflorescence axis

## MANAGEMENT

### 2. Collection Data

- 2.1 Collecting institute(s)\*
- 2.2 Collector's name
- 2.3 Collection date of original sample
- 2.4 Country of collection\*
- 2.5 Province/state

- 2.6 Collection site\*
- 2.7 Latitude of collection site: Degrees followed by N (North) or S (South)
- a) 2°N – 20°S
  - b) >30°N
- 2.8 Longitude of collection site: Degrees followed by E (East) or W (West)
- 2.9 Elevation of collection site (m): Altitude above sea level
- 2.10 Collection Source\*
- a) Wild habitat farmer's field
  - b) Farm store
  - c) Institute
  - d) Others
- 2.11 Status of sample\*
- a) Wild
  - b) Weedy
  - c) Breeding/research material
  - d) Induced mutant
  - e) Landrace
  - f) Advanced race
  - g) Interspecific derivative
  - h) Others
- 2.12 Number of plants sampled
- 2.13 Number of slips/weight of seeds collected
- 2.14 Type of sample\*
- a) Vegetative
  - b) Seed
  - c) Vegetative and seed
  - d) Tissue culture
  - e) Pure line
  - f) Mixture of different types
  - g) Segregating population
  - h) Others
- 2.15 Herbarium specimen
- a) Yes/no

b) Voucher number

2.16 Frequency of accession at collection site

a) Rare

b) Occasional

c) Frequent

d) Abundant

e) Very abundant

2.17 Cultural practices\*

a) Rainfed

b) Irrigated

c) Flooded

d) Riverbanks

e) Transplanted

f) others

2.18 Cropping system

a) Monoculture

b) Ridges/rings/slopes

c) Mixed with spices

d) Mixed with other crops

2.19 Plant population density

a) Low

b) Medium

c) High

2.20 Local/vernacular name

2.21 Ethnic group

2.22 Use(s) of the accession\*

a) Essential oil

b) Medicinal

c) Beverages/soft drinks

d) Flood/silt control

e) Phytoremediation of soil and water

f) Soil erosion

g) Bioengineering

h) Industrial applications (Hard board/products, pots, etc.)

i) Others (watershed management, cool screens)

2.23 Photograph of the habitat

2.24 Collection source environment

2.24.1 Growing period

2.24.2 Maturity

2.24.3 Vigor

2.24.4 Uniformity/homogeneity of population sampled

a) Highly uniform

b) Highly variable

2.24.5 Topography\*

a) Plain level

b) Flood plain

c) Undulating

d) Mountainous

e) Other (river basin, slopes etc.)

2.24.6 Soil fertility

a) Poor

b) Good

2.24.7 Soil pH range\*

a) 3 – 5

b) 6 – 8

c) >8

2.24.8 Soil moisture\*

a) Low

b) High

c) Drought

d) Waterlogged

2.24.9 Soil texture

a) Highly organic

b) Clay

c) Clay silt

d) Silt

- e) Silt sand
- f) Sandy
- g) Sandy loam
- h) Loam
- i) Gravelly
- j) Sodic
- k) Alkaline
- l) Acidic
- m) Toxic: Fed with aluminum/manganese/other heavy metals

2.24.10 Soil drainage

- a) Poor
- b) Good

2.25 Climate of collection site

2.25.1 Temperature range (°C)

2.25.2 Rainfall range (mm)

2.25.3 Wind (km/h)

2.25.4 Light

- a) Shady
- b) Sunny

2.26 Seed collection: yes/no

2.27 Associated crops: Other dominant crops around the collection site

2.28 Prevailing stresses: Biotic/abiotic stressed and their reaction to the accession

2.29 Collector's note: Specific notes in respect to above

**ENVIRONMENTAL REGIME AND PRELIMINARY EVALUATION ON SITE**

**3. Site Data**

3.1 Country

3.2 Site (research institute)

3.2.1 Name of farm or institute

3.3 Evaluator's name and address

3.4 Sowing date: In the format DDMMYYYY

3.5 Harvest date: In the format DDMMYYYY

- 3.6 Evaluation environment: Where characterization: Where characterization/preliminary evaluation was carried out
- a) Field
  - b) Glasshouse
  - c) Laboratory
  - d) Other
- 3.7 Seed germination (%)\*
- a) 0 - 30
  - b) 30 - 60
  - c) >60
- 3.8 Field establishment (%)
- a) 0 - 5
  - b) 5 - 10
  - c) >10
- 3.9 Number of days to 50% field emergence
- 3.10 Sowing site in field
- 3.11 Field spacing
- 3.11.1 Distance between plants in a row (cm)
- 3.11.2 Distance between rows (cm)
- 3.12 Soil texture
- a) Highly organic
  - b) Clay
  - c) Clay silt
  - d) Silt sand
  - e) Sandy
  - f) Sandy loam
  - g) Loam
  - h) Gravelly
- 3.13 Soil pH: Actual pH value of the soil around the root zone\*
- 3.14 Soil taxonomic classification: A detailed possible classification based on soil survey map to be given
- 3.15 Watering
- a) Irrigated
  - b) Rainfed

c) Both/alternate

- 3.16 Fertilizer: Specify name and dose
- 3.17 Plant protection: Specify pesticides
- 3.18 Climate (during growing season)
  - 3.18.1 Temperature range (°C)
  - 3.18.2 Heat unit during crop season
  - 3.18.3 Rainfall range (mm)
  - 3.18.4 Sunshine hours
  - 3.18.5 Notes

## **BOTANICAL CHARACTERIZATION**

### **4 Plant data**

- 4.1 Vegetative
- 4.2 Plant growth\*
  - a) Erect
  - b) Tufted
- 4.3 Foliage growth at quarterly harvests (cm)\*
  - 4.3.1 First harvest
  - 4.3.2 Second harvest
  - 4.3.3 Third harvest
- 4.4 Root character\*
  - a) Medium thick sparsely branched
  - b) Thin Profusely branched
- 4.4.1 Root diameter (mm) of thickest root over 1 year
  - a) <1.5
  - b) 1.6 – 2
  - c) 2.1 – 2.5
  - d) >2.5
- 4.5 Root yield/plant (g) over 1 year
  - a) <100
  - b) 101 – 200
  - c) 201 – 300
  - d) >300

4.6 Plant pigmentetion\*

- a) No anthocyanin
- b) Low anthocyanin
- c) Medium anthocyanin
- d) High anthocyanin
- e) Very high anthocyanin

4.7 Color of stem

- a) Pink
- b) Greenish pink
- c) Greenish yellow

4.8 Plant hairiness

- a) Glabrous
- b) Hairy
- c) Sparsely hairy
- d) Smooth

4.9 Plant height 1 year (cm)\*

- a) 25 – 50
- b) 51 – 75
- c) 76 – 100
- d) 101 – 150
- e) >150

4.10 Culms

- a) compressed
- b) Stout

4.11 Nodes

- a) Glabrous
- b) Scabrid

4.12 Number of tillers (one year plant)\*

- a) 0 – 20
- b) 21 – 40
- c) 41 – 60
- d) >60

4.12.1 Color of tillers



- a) Purple
- b) Light purple
- c) Green

4.12.2 Fertile tillers (%)\*

- a) 5 – 20
- b) 21 – 40
- c) 41 – 60
- d) 61 – 80
- e) >80

4.12.3 Sterile tillers (%)\*

- a) 0 – 10
- b) 11 – 20
- c) 21 – 40
- d) 41 – 60
- e) 61 – 80
- f) >86

4.13 Color of nodes

- a) Yellowish
- b) Light purple
- c) Green

4.14 Number of leaves/tiller

- a) 4 – 8
- b) 8 – 20
- c) >20

4.14.1 Texture of leaf sheath\*

- a) Smooth
- b) Rough

4.14.2 Nature of leaf sheath

- a) Compressed
- b) Expanded
- c) Keel shaped
- d) Fan shaped

4.14.3 Color of leaf sheath

- a) Green
- b) Pink
- c) Pale greenish

4.14.4 Type of leaf\*

- a) Radical
- b) Subradical

4.14.5 Shape of leaf blade

- a) Linear
- b) Lanceolate
- c) Linear-lanceolate

4.14.6 Length of leaf blade (cm)

- a) 5 – 20
- b) 20 – 30
- c) 31 – 50
- d) 50

4.14.7 Width of leaf blade (mm)

- a) 0 – 10
- b) 10 – 20

4.14.8 Color of leaves\*

- a) Green
- b) Greenish purple
- c) Dark purple greenish

4.14.9 Leaf sheath length (cm)\*

- a) 4 – 10
- b) 10 – 20
- c) >20

4.14.10 Color of leaf sheath

- a) Pink
- b) Greenish pink

4.14.11 Leaf texture

- a) Rigid
- b) Spongy

4.14.2 Leaf surface\*

- a) Smooth
- b) Rough
- c) Glabrous
- d) Hairy (downwards)

4.14.13 Margins of leaf blade

- a) Scabrid
- b) Glabrous

4.14.14 Tip of leaf blade

- a) Acute
- b) Acute acuminate
- c) Acuminate

4.14.15 space between the first leaf and the inflorescence (cm)\*

- a) 2 – 7
- b) 8 – 13
- c) >14

4.15 Size of ligule (mm)

- a) Small (0.2 – 2.5)
- b) Medium (2.6 - 5)

4.15.1 Shape of ligule

- a) Fimbriate membrane with short hair
- b) Fimbriate membrane with long hair
- c) Scarious rim

4.15.2 Margin of ligule

- a) Entire
- b) Lacerate

4.15.3 Shape of the tip of ligule

- a) Acute
- b) Truncate
- c) Flat

4.15.4 Nature of ligule

- a) Membranous
- b) Scarious
- c) Hairy

4.16 Number of inflorescence\*

- a) 2 – 20
- b) 21 – 40
- c) 41 – 60
- d) 61 – 80
- e) >80

4.16.3 Color of inflorescence\*

- a) Yellowish to black
- b) Olive violet
- c) Yellow
- d) Purplish

4.16.4 Shape of panicles

- a) Narrow
- b) Contracted
- c) Oblong
- d) Conical

4.16.5 Size of panicles (cm)\*

- a) 5 – 10
- b) 10 – 20
- c) >20

4.16.6 Number of racemes/inflorescence

- a) 0 – 5
- b) >5

4.16.7 Density of racemes\*

- a) Low
- b) High

4.16.8 Morphology of racemes

- a) Minutely ciliolate
- b) Jointed
- c) Smooth Jointed
- d) Rough Jointed
- e) Tuft of hairs

4.16.9 Shape of spikelets

a) Lanceolate

b) Linear

c) Linear-lanceolate

4.16.10 Size of sessile spikelets (mm)

a) 0 – 2

b) 2 – 4

c) 4 – 6

4.16.11 Size of pedicelled spikelets (mm)

a) 0 – 3

b) 3 – 6

c) >6

4.16.12 Joints (nodes) of spikelet-hairy

a) No

b) Yes

4.16.13 Nature of spikelets

a) Male

b) Hermaphrodite

4.16.14 Shape of lower glume

a) Lanceolate

b) Spinulose

c) Ovate

d) Linear

4.16.15 Color of lower glume

a) Reddish

b) Greenish

c) Yellowish

4.16.16 Texture of lower glume

a) Coriaceous

b) Chartaceous

4.16.17 Tip of Lower glume

a) Entire

b) Notched

c) Cleft

4.16.18 Morphology of lower glume

- a) Tubercled on the back
- b) Muriculate on the back

4.16.19 Shape of the tip of lower glume

- a) Acute
- b) Obtuse

4.16.20 Nerves of lower glume

- a) 1 – 3 nerved
- b) 3 – 5 nerved

4.16.21 Margins of lower glume

- a) Hairy
- b) Glabrous
- c) Marginal tubercles
- d) Spinulose

4.16.22 Edges of lower glume

- a) Winged
- b) Wingless

4.16.23 Shape of upper glume

- a) Boat shaped
- b) Keeled
- c) Ciliolate
- d) Oblong lanceolate
- e) Scabrid

4.16.24 Tip of upper glume

- a) Entire
- b) Notched
- c) Cleft

4.16.25 Shape of the tip of upper glume

- a) Acute
- b) Obtuse

4.16.26 Nerves of upper glume

- a) 1 – 3 nerved
- b) 3 – 5 nerved

4.16.27 Margins of upper glume

- a) Hairy
- b) Glabrous

4.16.28 Edges of upper glume

- a) Winged
- b) Wingless

4.16.29 Size of lemma (mm)

- a) Small (1 – 1.7)
- b) Medium (1.8 – 2.5)
- c) Large (>2.5)

4.16.30 Shape of lemma

- a) Ovate
- b) Linear

4.16.31 Lobes of lemma

- a) 0
- b) 2

4.16.32 Texture of lemma

- a) Membranous
- b) Chartaceous
- c) Hyaline

4.16.33 Tip of lemma

- a) Entire
- b) Notched

4.16.34 Shape of the tip of lemma

- a) Acute
- b) Mucronate

4.16.35 Nerves of lemma

- a) 3 nerved
- b) 3 nerved

4.16.36 Awn of lemma\*

- a) No
- b) Yes

4.16.37 Margins of lemma

- a) Infolded
- b) Nonfolded
- c) Ciliated

4.16.38 Shape of palea

- a) Linear
- b) Lanceolate

4.16.39 Pedicel

- a) Grooved
- b) Non-grooved

4.16.40 Color of pedicel joints

- a) Yellow
- b) White

4.16.41 Size of anther (mm)

- a) Small (0.75 – 1.25)
- b) Medium (1.26 – 1.75)
- c) >1.75

4.16.42 Shape of sessile spikelet (ss)

- a) Linear-lanceolate
- b) Lanceolate
- c) Oblong-ovate

4.16.43 Shape of lower glume (ss)

- a) Lanceolate
- b) Oblong
- c) Linear-oblong

4.16.44 Size of lower glume (ss) (mm)

- a) 3 – 3.7
- b) 3.8 – 4.5
- c) >4.5

4.16.45 Tip of lower glume (ss)

- a) Entire
- b) Notched
- c) Cleft

4.16.46 Color of glume tip (ss)



a) Reddish

b) Green

4.16.47 Color of glume (ss)

a) Pink

b) Greenish Pink

4.16.48 Shape of glume tip (ss)

a) Acute

b) Obtuse

4.16.49 Margin of lower glume (ss)

a) Winged

b) Wingless

4.16.50 Nerves of lower glume (ss)

a) 1 – 3 nerved

b) 3 – 5 nerved

4.16.51 Presence of the tubercles at the back (ss)

a) Yes

b) No

4.16.52 Shape of upper glume (ss)

a) Ovate-elliptic

b) Ovate-lanceolate

c) Lanceolate

d) Linear

4.16.53 Shape of glume tip (ss)

a) Acute

b) Obtuse

4.16.54 Edges of upper glume (ss)

a) Infolded

b) Non-infolded

4.16.55 Nature of upper glume (ss)

a) Hyaline

b) Membranous

c) Chartaceous

4.16.56 Tip of upper glume (ss)

- a) Entire
- b) Notched
- c) Cleft

4.16.57 Margins of upper glume (ss)

- a) Infolded
- b) Noninfolded

4.16.58 Nerves of upper glume (ss) \*

- a) 3 nerved
- b) 3 – 5 nerved

4.16.59 Shape of lower lemma (ss)

- a) Ovate-lanceolate
- b) Ovate
- c) Lanceolate
- d) Linear

4.16.60 Tip of lower lemma

- a) Ciliate
- b) Acute
- c) Mucronate

4.16.61 Texture of lower/upper lemma

- a) Rough
- b) Smooth
- c) Hyaline

4.16.62 Margins of lower lemma

- a) Ciliate
- b) Folded

4.16.63 Shape of upper lemma

- a) Linear
- b) Oblong-lanceolate

4.16.64 Tip of upper lemma

- a) Eciliate
- b) Acute

4.16.65 Size of upper lemma (mm)

- a) 2 – 3

b) >3

4.16.66 Length of awn (mm)

a) 4 – 7

b) 8 – 11

c) >11

4.16.67 Knees of awn

a) Hairy

b) Scabrid

4.16.68 Shape of palaea

a) Linear

b) Linear-lanceolate

c) Lanceolate

4.16.69 Character of palaea

a) Hyaline

b) Membranous

4.16.70 Nerves in palaea

a) Yes

b) No

4.16.71 Number of anthers

4.16.72 Size of anthers (mm)

a) 0 – 2

b) 2 – 4

4.16.73 Size of ovary (mm)

a) 0.5 – 0.8

b) 0.9 – 1.2

c) >1.2

4.16.74 Color of stigma \*

a) White

b) Red/pink

4.16.75 Shape of stigma \*

a) Straight

b) Inclined back

4.16.76 Size of lodicules

a) 0.2 – 0.35

b) >0.36

4.16.77 Shape of lodicules

a) Obovate

b) Oblong

c) Trigone

4.17 Shape of fruit caryopsis

a) Linear-oblong

b) Oblong

c) Linear

4.17.1 Apex of fruit

a) Oblique

b) Slightly oblique

c) Straight

4.17.2 Shape of grain

a) Obovate

b) Linear

c) Oblong

d) Trigone

4.17.3 Size of grain (mm) \*

a) 0.5 – 0.9

b) 1 – 1.4

c) >1.4

4.17.4 Percentage seed viability\*

a) 0 – 30

b) 30 – 60

c) >60

4.17.5 Percentage seed germination

a) 0 – 5

b) 5 – 10

c) >10

4.18 Flowering\*

4.18.1 Flowering intensity

- a) Profuse flowering – seed propagation
- b) Less but late flowering – little seed formation
- c) Less or non flowering – sterile, vegetative propagation

#### 4.18.2 Time of flowering

- a) Early (Jan – Mar)
- b) Normal (May – Jul)
- c) Late (Sep – Oct)
- d) Very Late (Nov – Dec)

#### 4.19 Genetic variation\*

- a) North Indian type (i.e. profuse flowering, heavy essential oil)
- b) South Indian type (late/no flowering, lighter essential oil)

#### 4.20 Essential oil quality\*

- a) Optical rotation: dextrorotatory
- b) Optical rotation: laevorotatory (i.e. superior oil quality)
- c) Specific gravity <1, 1 or >1 (i.e. superior oil quality)

##### 4.20.1 Chemical property

- a) Distinctly rich in alcoholic fractions, containing <20% ketones (i.e. superior quality)
- b) Lesser alcoholic fractions having >20% ketones

##### 4.20.2 Oil concentration in fresh roots (w/v%)

- a) Up to 0.1 (virtually no oil)
- b) 0.1 to 0.5 (low concentration)
- c) 0.5 – 1.0 (medium oil concentration)
- d) 1.0 – 1.5 (high oil concentration)
- e) >1.5 (very high oil concentration)

##### 4.20.3 Color of oil

- a) Brownish
- b) Yellow
- c) Deep brown
- d) Golden yellow
- e) Reddish brown

##### 4.20.4 Aroma of oil\*

- a) Fine khus note
- b) Spicy khus note

- c) True earthy khus note
- d) Rosy Khus note
- e) Saffron

4.21 Chromosome number:  $2n = 20$ , and variations thereof

4.21.1 DNA Content (2C value in pico g):  $>2.5$

4.21.2 DNA finger printing: DNA molecular markers using RFLP, AFLP and RAPD can help in discrimination and characterizing genetically differences. Describe any discrimination or useful trait that can be differentiated by molecular markers/DNA primers (e.g. primer AGGCCGCCTT , C C G A A C A C G G , G T C C C G T G G T , T C G G C A C G C A , T C T G T C G G T c give differentiating RAPD patterns (Adams 2002, Srifah et al.. 1998).

## References

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- Srifah, P.; Ruanjaichon, V.; and Sangduen, N. 1998. The use of random amplified polymorphic DNA for classification and identification of *Vetiveria* spp. in Thailand. Proc. ICV-1: Vetiver – A Miracle Grass, ORDPB, Bangkok, pp. 141 – 146.

## ICV-2 Proceedings Published

The Office of the Royal Development Projects Board is pleased to announce the publication of the Proceedings of the Second International Conference on Vetiver: Vetiver and the Environment, (ICV-2) which was held at Cha-am, Phetchaburi, Thailand, on 18-22 January 2000. The Proceedings has been edited by Dr. Narong Chomchalow, Editor of Vetiverim, and Mr. Marcel Barang, Editorial Consultant of FAO Regional Office for Asia and the Pacific.

The contents of ICV-2 Proceedings include Executive Summary, Part One: Keynote Address (1 paper), Part Two (4 papers of General and 6 papers of the King of Thailand Vetiver Award winners), Part Three: Panel Discussions (6 papers of “Experience in putting together countrywide vetiver programs: Policy issues, Expectations and results”; 4 papers of “Vetiver and natural disaster”; 4 papers of “Reprots of regional networks”; and 4 papers of “Reprots of national networks”), Part Four: Concurrent Presentation (14 papers

of “Soil and water attributes”; 4 papers of “Pollution control and treatment/Restoration and rehabilitation of Disturbed and contaminated areas”; 1 paper of “Disaster prevention”; 6 papers of “Training and technology dissemination”; 14 papers of “Basic research and general studies”; 2 papers of “Alternative uses and socio-economic values of vetiver”; and 5 papers of other topics), and Part Five: Closing Remarks (1 paper). There are altogether 482 pages, including author and subject indexes.

*The Proceedings has already been sent to all registered participants of ICV-2 as well as the Coordinators of the Vetiver Networks around the world. Libraries and other interested persons, as well as those participants who did not provide proper addresses during Registration, wishing to have a copy of the Proceedings please send your request to: The International Affairs Section, The Office of the Proceedings please send you request to: The International Affairs Section, The Office of the Royal Development Projects Board, 78 Rajdamnern Nok Avenue, Dusit, Bangkok 10300, Thailand, E-mail: <vetiver@mail.rdpb.go.th>*

### **Change of Deadline for The Vetiver Network Awards - Series 3**

The announcement of “The Vetiver Network Awards – Series 3” has already been made in Vetiverim 15. As the deadline for submission of the nominations has been changed from October 2003 to July 2003 in anticipation of the Third International conference on Vetiver (ICV-3), which will be held in China, 6-9 October 2003, and to further publicize the Awards, the Editor is pleased to present a few salient points of the awards, valued at US\$45,000 in prize money, which have been made possible, thanks to a generous grant from the William H. Donner Foundation. As in the past, The Vetiver Network (TVN) hopes to receive many nominations for each category. The competition for The Vetiver Network Awards, in years past, has brought out information that significantly increased our knowledge of vetive’s uses, applications, and benefits. Award winners will be announced at ICV-3. For full detail, see the original article on pages 17-19 of Vetiverim 15 (with the change of deadline), or in the website <www.vetiver.com>

### **TVN Award Categories**

Within these categories there are no pre-defined topics. The creativity and innovation of the user is the only constraint. The ideas listed below in each category are only illustrative to give a clearer idea of what might be interesting.

1. *Water Applications:* The theme of ICV-3 is “Vetiver and Water”. Most Vetiver System (VS) applications can be thought of in terms of its relationship to, and effect on, water through:
  - a. *Watershed Protection/Improvement:* The use of VS for protecting and improving the quality of water through treatment of a watershed, streambanks and streamside buffers, for soil moisture and/or groundwater improvement, reduction of sedimentation, etc.

- b. *Engineering*: The use of VS to protect and stabilize the banks and channels of natural and constructed waterways and dams.
  - c. *Quality*: The use of VS to control and treat polluted surface water, groundwater and wastewater.
2. *Bioengineering applications*: The use of VS for stabilization and protection of buildings, roadsides, railroads, bridges, industrial sites, landfills, cut-and-fill slopes, and other infrastructure or engineering applications, for slope stabilization in vulnerability/hazard reduction, etc.
  3. *Land Reclamation*: The use of VS for reclamation of abandoned and polluted, toxic lands, degraded sites, gully stabilization, mine spoils and slimes stabilization and revegetation, improvement of extreme soils, etc.
  4. *Dissemination*: Original publication, brochure, pamphlet, multi-media, etc.
  5. *Country Vetiver Award*: Award given to acknowledge the best overall achievements and results of a VS program in a country.
  6. *Farmer/User Awards*: Awards to acknowledge the utilization of vetiver by individuals to improve the quality of their lives through economic and environmental improvements via increased production of agricultural lands, economic/environmental improvement and/or other uses of VS such as providing mulch, fuel, artisanal uses, livestock fodder, etc. There will be awards made in each of the following regions of the world: (a) Asia, (b) Africa, (c) Latin America, and (d) Other.
  7. *Vetiver Champion*: Open to nominations for people who have been instrumental, either in their country (region, globally) or technical area (for example, research, soil and moisture conservation, etc.) in effective and dedicated promotion, investigation, improvement, etc. of the use of the VS.

***Please send nominations to:*** *The Vetiver Network, 3601 N 14<sup>th</sup> Street, Arlington, Virginia 22201, USA.*  
*Please include a self-addressed card which we can then return to you to acknowledge receipt of nomination.*

### **A New Project for Mountain Re-vegetation Launched in Nanjing, China\***

The speed up the re-vegetation of Mofu Mountain with vetiver, a new project was launched in Nanjing, China. Situated at the northern part of Nanjing City, Mofu Mountain has an area of 7.04 km<sup>2</sup>. Caused by quarrying and garbage filling, the mountain is covered by rock fragments, garbage and sediments that were excavated from a lake. Following the expansion of the city and economy development, it is urgent to ‘green up’ the disordered mountain. However, due to poor ecological condition, it is not easy for most plants to survive. When the Vice Mayor of Nanjing City got some

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\* By Liyu Xu, Coordinator, China Vetiver Network, Nanjing, China



information on vetiver, he asked the Mountain Landscape Management Office to contact the China Vetiver Network to use vetiver in this project. Through a short discussion, an agreement was reached and vetiver has already been planted. The project includes the application to the four kinds of land: the fragments left by quarrying, the sediments coming from the lake, the rocky mount, and the parent rock.

For the fragments and sediments areas, bare-root vetiver slips were contour planted at the spacing of 1 m between rows. For the rocky and stony areas, vetiver slips in the containers were planted. For parent rock sites that contain neither soil nor rock fragments, column holes were excavated, and then containerized vetiver slips were put into the holes. The basic soil and ecological properties have been studied and recorded. The whole project will last one year.

Since there are large areas similar to the Mofu Mountain near Nanjing City that are waiting for re-vegetation, the present project attracts wide interests among correspondents and reporters. The project has been publicized in the newspaper, such as in the Nanjing Daily and the Jingling Evening newspapers.

### **Large Scale Training Implemented in the Dabie Mountains of China\***

Supported by Voluntary Agencies Support Scheme (VASS) of New Zealand, New Zealand Salvation Army, AusAid, Australia Salvation Army, and Hong Kong and Macao Salvation Army, China Vetiver and Agroforestry Technology Project (CVAT Project) has been launched in the Dabie Mountains of China. The project focuses on environmental protection and poverty alleviation through the establishment of millions of economic trees and the introduction of vetiver system and agroforestry technology. One of the most important issues is to introduce the vetiver system to the mountain area to control soil erosion and to protect newly planted economic trees. Since vetiver grass was quite a new thing in that area, training is a very important component of the project.

### **Training Material Preparation**

Since the time was very tight at the beginning of the implementation of the project, China Vetiver Network (CVN) was very busy with preparation of training materials even during the Spring Holiday season. CVN produced 6,000 copies of Vetiver Newsletter and five issues of FACT Sheets with 4,000 copies for each issue simply introducing vetiver grass, the technical specification of the three economic trees with vetiver hedges protected, the new version of Green Book of vetiver, the book on tea tree cultivation, etc. Most of the materials were distributed to project farmers and others were posted to non-project farmers in and outside the Dabie Mountains.

## **On-site Training**

At the beginning of the planting season of March 2002, short training was implemented in order to teach farmers how to plant vetiver. The training was conducted usually in the field and focused on hand-on practice. It contained contour line design with U pipe, transportation, cutting, splitting, dipping vetiver roots in clay paste, and planting of vetiver grass and economic trees.

## **The Lectures**

Because planting season was very short and we should grasp the most suitable time for planting, we could not introduce the technology more completely or systematically. Therefore, on 4-10 June 2002 we took one week to train project farmers. The training contained almost all of the topics on vetiver, including vetiver behavior, tolerance to different soil, pH, waterlogging and drought, various uses of vetiver, planting and management, the networking in China and in the world for information dissemination. Altogether, over 200 farmers in two villages participated in this training. Each course accommodated 50 to 100 participants. Besides, the project distributed large amount of training materials to the nearby areas to expand the result of the training. The training combined vetiver with economic-tree production, i.e. to protect trees with vetiver hedges. During the training, color posters produced by The Vetiver Network were distributed, and hundreds of photographs, showing the characteristics of vetiver and its various uses in China and in the world, were shown.

The lectures on tea planting included the planting and cultivation, pruning for young and old plants, the application of fertilizer, manure, and green manure using the pruned vetiver leaves, the establishment of vetiver hedges in tea garden, etc. Further training courses will be conducted later on vetiver and economic-tree planting, including vetiver handcraft production.

The program officer, Ms. Jocelyn N.Y. Mah from the Salvation army, joined most of the training courses, and checked project document including agreement with farmers and financial account.

## **The King of Thailand's Third Vetiver Award**

As announced in Vetiverim 18, Princess Maha Chakri Sirindhorn, Chairperson of His Majesty the King Of Thailand's Chaipattana Foundation, has agreed to grant US\$10,000 from the Chaipattana Foundation for "The King of Thailand Vetiver Award" for the most outstanding works on vetiver. This is the third time that such an award (of the same amount of US\$10,000) is given (the first was given in 1992, the second in 2000). This award will be split into two prizes, valued at US\$5,000 each; one prize will be awarded to the most outstanding research on vetiver and the other to the best program for the dissemination of vetiver technology.

Nominations for the award may come from any person of any nationality. Please send nomination to:

Office of the Royal Development Projects Board

78 Rajdamnern Nok Ave.

Dusit, Bangkok 10300

Thailand

Fax: +66 (0) 2280-6206, 2629-8915

E-mail: [vetiver@mail.rdpb.go.th](mailto:vetiver@mail.rdpb.go.th)

Please include a self-addressed card that can be returned to the nominees to acknowledge receipt of nomination. The nominations must be post-marked on or before 30 June 2003.

The announcement of the winners will be made in August 2003. The winners will receive the awards from Her Royal Highness Princess Maha Chakri Sirindhorn, the patron of the Vetiver Network, on His Majesty's behalf, during the Opening Ceremony of the Third International Conference on Vetiver (ICV-3) in Guangzhou, Guangdong, China on 6 October 2003. The award does not cover the cost of participation at ICV-3. The awardees are advised to seek their own financial assistance from other sources to be able to receive the award at ICV-3.

**The Third International Conference on Vetiver  
(ICV-3) and Exhibition**

**Vetiver and Water: An Eco-Technology for Land Stabilization**

**Water Quality Improvement and Environment Enhancement**

**October 6-9, 2003 at the Guangdong Hotel, Guangzhou, PR China**

**Organized by:** The Guangdong Academy of Agricultural Sciences

The South China Institute of Botany, Chinese Academy of Sciences

The South China Agricultural University

The Guangdong Association of Grass Industry and Environment

**Tentative Program**

**Sunday, October 5, 2003:** Registration, Reception Party

**Monday, October 6, 2003:** Opening, Award Ceremony, Plenary Lectures and Reports, and First Business Meeting

**Tuesday, October 7, 2003:** Concurrent Sessions, and Second Business Meeting

**Session I:** Erosion and Flood Control, and Slope Stabilization

**Session II:** Pollution Mitigation and Disaster Prevention

**Session III:** Wastewater Purification, Element Uptake and Pollutant Decomposition

**Session IV:** Basic Scientific Research and Other Aspects

**Wednesday, October 8, 2003:** Field Trip and Farewell Party

**Thursday, October 9, 2003:** Plenary Session, Free Talk, Discussion and Closing (at noon)

Vetiverim readers are cordially invited to participate in this important conference.

**Oral Presentation:** Papers for all sessions are invited. Details will be announced later.

**Poster:** Each poster presentation will be provided with two boards, each being 90 x 120 cm.

**Exhibition:** The space for each booth is 3 x 3 m. The charge is US\$300 for a space. The booth stays from October 5<sup>th</sup> to October 7<sup>th</sup>

**Registration Fee:** Participant, US\$200; Accompanying Person, US\$100.

**Accommodation:** Huatai Hotel (3-star), Guangdong Hotel (4-star) and Garden Hotel (5-star)

**Contact for all administrative matters:** Mr. Jiang Mingdian, ICV-3 Office, Guangdong Academy of Agricultural Sciences, Wushan, Guangzhou 510640, P.R. China. Phone: +86-20-85514259, Fax: +86-20-87503358, Email: [faogaas@public.guangzhou.gd.cn](mailto:faogaas@public.guangzhou.gd.cn) or [office@icv-3.com](mailto:office@icv-3.com) and the conference website at [www.icv-3.com](http://www.icv-3.com).

**For all technical aspects of the conference contact:**

**Abroad:** Dr. Narong Chomchalow <[journal@au.ac.th](mailto:journal@au.ac.th)> and

Mr. Richard Grimshaw <[dickgrimshaw@vetiver.org](mailto:dickgrimshaw@vetiver.org)>

**In China:** Dr. Xia Hanping <[xiahanp@scib.ac.cn](mailto:xiahanp@scib.ac.cn)> and Mr. Xu Liyu <[lyxu@issas.ac.cn](mailto:lyxu@issas.ac.cn)>

#### **Important Deadlines**

- Registration deadline: March 31, 2003
- Abstract submission deadline: April 30, 2003
- Full paper submission deadline: June 30, 2003
- Exhibition application deadline: August 31, 2003

**More Details will be announced in the next issue of Vetiverim**

## Letters to the Editor

### ICV-3 in China

It is heartening to see the diverse and extensive applications of vetiver in southern China, as outlined in your email. I received the hard-copy report yesterday, and the wonderful photos reinforce both that vetiver is well-suited to the myriad applications shown, and that the area is appropriate for. I fully concur with your recommendations, and certainly defer to future judgments that may be appropriate regarding the relative roles of the Continuing Committee, the Guangdong Academy of Agricultural Science, the Chaipattana Foundation, The Vetiver Network, and other stakeholders. The outstanding work in Fujian also merits the highest recognition, and I am confident their continued activities will inform the overall presentation of Chinese vetiver.

I also strongly endorse John Greenfield's comments on the economic value of vetiver. Many things in the built environment – roads, drainage systems, landfills – provide no direct return; we invest in them because they provide an enabling environment for enhanced economic activity. Vetiver serves to stabilize and reintegrate the landscape, thus providing economic activities with a dependable platform that reduces risk and enhances profit, while also yielding environmental services that allow us to sustain our soils, clean our waters, and isolate our wastes. The scale of these benefits extends from the individual user to continental watersheds controlled by national or multinational authorities. As HRH Princess Maha Chakri Sirindhorn stated at ICV-2, “The benefits of vetiver are general and global”.

Mark Dafforn <VetiverNet@aol.com>

US National Academy of Science, Washington, DC, USA

*Thanks for your kind comments on the organization of ICV-3 and the economic value of vetiver. I fully agree with all your views. – Ed.*

### Vetiver Network Acronym

I note that in the case of the Andean and El Salvador/Nicaragua Networks you classify them as ‘Sub-regional Networks’. Later, you list Italy and Israel as nationals under the EMVN regional umbrella. In our EMVN case I have tried to promote the concept of national networks primarily as a form of delegation, even though initially, they may not be especially active. Language is a key factor in the issue. So, I have actually appointed coordinators for Spain (Maria Jos Martinez), Italy (Claudio Zarotti), Albania (Vangjo Kovaci), Israel (Leo Toledano) and Morocco (Dale Rachmeler). I may well expand this list in the future. At this stage, I am disinclined to formalize the arrangement. That might come later. I think my promotion of national sub-networks should not be confused with those country networks that are very active in themselves. So, I wonder whether one solution applicable to ‘Sub-regional Networks’ might be

to have 6 letters in the acronym, specific to this categorization. Thus, for example, Spain could be EMVNES, Portugal EMVNPT, and Israel EMVNIS.

Mike Pease <mikepease@mail.telepac.pt>

Coordinator, Europe and Mediterranean Vetiver Network, Portugal

*Your suggestion to use a six-letters code for sub-regional networks is interesting. However, I still think that should be no difference in the number of letters in the network acronyms, whether they are global, regional, sub-regional, country, or city. This is to avoid inconsistency. Your sub-regional networks are, in fact, country networks. It does not matter whether or not they are active or not quite active at present. Moreover, there are some country networks, for example, India Vetiver Network, which are not attached to any regional network. What do we do with them if we adopt a six-letter code for these networks? – Ed.*

### ***Vernacular Names of Vetiver***

With respect to your draft on “Vernacular Names of Vetiver”, I have made a few changes with respect to India. The corrected version includes information with respect to recognized Indian Languages plus one major tribal language ‘santhali’.

You may notice that I have deleted portions with respect to Garnar (now included under Gujarati); Karnataka (the name of the state in India where the spoken language is Kannada); Mundari – this is not known to me, may be it is a name given to small pocket in India, hence need not be mentioned; Mysore is a city as well as old name of the state of Karnataka of which the official language is Kannada, Oudh is the ancient name of the area where my city Lucknow is located; Sadani is not a familiar name – may be a small tribal name. Of course I would like to retain the name of ‘Santhali’ as it is a major tribe in the states of Bihar and West Bengal, although ‘Santhali’ is not a recognized Indian language but certainly a prominent local language. There is no dialect/language like ‘Ayurvedic’ in India. In fact ‘Ayurveda’ is an ancient Indian medical treatise, the system of the medicine is called as ‘Ayurvedic System of Medicine’, and the language used is ‘Sanskrit’, and for vetiver the Sanskrit name is ‘Ushira’. Of the 14 recognized languages, ‘Hindi’ is the official national language spoken in major part of India, especially entire north. ‘Hindi’ has its origin from ‘Sanskrit’ - the mother of all languages, and ‘Urdu’ is derived from ‘Hindi’ with a Persian script.

I hope this information would be useful for your article with respect to India. I think that for an article like yours it is better that ambiguities are avoided, lest the major theme is lost in oblivion.

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*Thanks for your information that has already been incorporated into the final version of my paper. I only wish that others who are familiar with dialects/languages in different countries countries cited in my paper would do the same so that at the end, the information is correct, with no ambiguities, and, as you pointed out, “lest the major theme is lost in oblivion”. – Ed.*