Package ‘ALUES’

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Title Agricultural Land Use Evaluation System
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Description Evaluates land suitability for different crops production.
The package is based on the Food and Agriculture Organization (FAO) and the
International Rice Research Institute (IRRI) methodology for land evaluation.
Development of ALUES is inspired by similar tool for land evaluation, Land Use
Suitability Evaluation Tool (LUSET). The package uses fuzzy logic approach to evaluate
land suitability of a particular area based on inputs such as rainfall, temperature,
topography, and soil properties. The membership functions used for fuzzy modeling are
the following: Triangular, Trapezoidal and Gaussian. The methods for computing the
overall suitability of a particular area are also included, and these are the Minimum,
Maximum and Average. Finally, ALUES is a highly optimized library with core algorithms
written in C++.
License MIT + file LICENSE
LazyData true
LinkingTo Rcpp
Encoding UTF-8
Depends R (>= 3.5.0), Rcpp (>= 0.10.6)
Suggests testthat, markdown, knitr, microbenchmark, ggmap, raster,
reshape2
RoxygenNote 7.1.1
VignetteBuilder knitr
URL https://github.com/alstat/ALUES/
BugReports https://github.com/alstat/ALUES/issues/
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Description

Agricultural Land Use Evaluation System (ALUES) is a package that evaluates land suitability for different crop production. The package is based on the Food and Agriculture Organization (FAO) and the International Rice Research Institute (IRRI) methodology for land evaluation. Development of ALUES is inspired by similar tool for land evaluation, Land Use Suitability Evaluation Tool (LUSET). The package uses fuzzy logic approach to evaluate land suitability of a particular area based on inputs such as rainfall, temperature, topography, and soil properties. The membership functions used for fuzzy modeling are the following: Triangular, Trapezoidal, Gaussian, Sigmoidal and custom models with functions that can be defined by the user. The package also aims on complicated methods like considering more than one fuzzy membership function on different suitability class. The methods for computing the overall suitability of a particular area are also included, and these are the Minimum, Maximum, Product, Sum, Average, Exponential and Gamma. Finally, ALUES utilizes the power of Rcpp library for efficient computation.

Author(s)

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Arnold R. Salvacion <arsalvacion@gmail.com>
Bui Tan Yen

Description

A dataset containing the soil characteristics of the crop requirements for farming Alfalfa.

Format

A data frame with 12 rows and 8 columns
Details

The following are the factors for evaluation:

- SoilTe - 12 classes of soil texture (Soil Taxonomy)
- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also


ALFALFATemp

| ALFALFATemp | Alfalfa temp requirement for land evaluation |

Description

A dataset containing the temp characteristics of the crop requirements for farming Alfalfa.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)

See Also

**ALFALFA Terrain**

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Alfalfa.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)

**See Also**


---

**ALFALFA Water**

**Description**

A dataset containing the water characteristics of the crop requirements for farming Alfalfa.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CropLen - Length of growing period (days)
- WgAv - Precipitation of growing cycle (mm)
- WghAv - Relative humidity growing cycle (%)
AVOCADOSoil

Description

A dataset containing the soil characteristics of the crop requirements for farming Avocado.

Format

A data frame with 10 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also

AVOCADOTemp

Description
A dataset containing the temp characteristics of the crop requirements for farming Avocado.

Format
A data frame with 2 rows and 8 columns

Details
The following are the factors for evaluation:
• TgAv - Mean temperature of the growing cycle (°C)
• TmMinXm - Average minimum temperature of coldest month (°C)

See Also

AVOCADOTerrain

Description
A dataset containing the terrain characteristics of the crop requirements for farming Avocado.

Format
A data frame with 5 rows and 8 columns

Details
The following are the factors for evaluation:
• Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
• Slope2 - Slope (%) (2. High level of management with full mechanization.)
• Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
• Flood - Flooding
• Drainage - Drainage

See Also
**AVOCADO Water**

**Description**

A dataset containing the water characteristics of the crop requirements for farming Avocado.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)

**See Also**


---

**BAMBOO Soil**

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Bamboo.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- SoilDpt - Soil depth (cm)
- OC - Organic carbon (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)
- pHH2O - pH H2O

**See Also**

BAMBOOTemp

BAMBOOTemp  Bamboo temp requirement for land evaluation

Description
A dataset containing the temp characteristics of the crop requirements for farming Bamboo.

Format
A data frame with 1 rows and 8 columns

Details
The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)

See Also

BAMBOOTerrain

BAMBOOTerrain  Bamboo terrain requirement for land evaluation

Description
A dataset containing the terrain characteristics of the crop requirements for farming Bamboo.

Format
A data frame with 1 rows and 8 columns

Details
The following are the factors for evaluation:

- SlopeD - Slope (degree, 6 classes)

See Also
BAMBOOWater  
Bamboo water requirement for land evaluation

Description
A dataset containing the water characteristics of the crop requirements for farming Bamboo.

Format
A data frame with 1 rows and 8 columns

Details
The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)

See Also

BANANASoil  
Banana soil requirement for land evaluation

Description
A dataset containing the soil characteristics of the crop requirements for farming Banana.

Format
A data frame with 12 rows and 8 columns

Details
The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
### BANANATemp

- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

#### See Also


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### Description

A dataset containing the temp characteristics of the crop requirements for farming Banana.

### Format

A data frame with 3 rows and 8 columns

### Details

The following are the factors for evaluation:

- TyMaxAv - Mean annual maximum temperature (°C)
- TmMinXm - Average minimum temperature of coldest month (°C)
- TmMinXmAb - Absolute min temp. coldest month (°C)

#### See Also

**BANANATerrain**

*Banana terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Banana.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)

**See Also**


---

**BANANAWater**

*Banana water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Banana.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)
BARLEYSoil

See Also


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| BARLEYSoil | Barley soil requirement for land evaluation |

Description

A dataset containing the soil characteristics of the crop requirements for farming Barley.

Format

A data frame with 13 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%) 
- Gyps - Gypsum (%) 
- CECc - Apparent CEC Clay (cmol (+)/kg clay) 
- BS - Base Saturation (%) 
- SumBCs - Sum of basic cations (cmol (+)/kg soil) 
- pHH2O - pH H2O 
- OC6 - Organic carbon (%) - Kaolinitic materials 
- OC7 - Organic carbon (%) - Non Kaolinitic, Non calcareous materials 
- OC8 - Organic carbon (%) - Calcareous materials 
- ECedS - ECe (dS/m) 
- ESP - ESP (%) 

See Also

**BARLEYTemp**

*Barley temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Barley.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TmAv2 - Mean temp. crop development stage (2nd month) (°C)
- TmAv3 - Mean temp. of the flowering stage (°C)
- TmAv4 - Mean temp. of the ripening stage (°C)

**See Also**


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**BARLEYTerrain**

*Barley terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Barley.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization. )
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
BARLEYWater

See Also


**BARLEYWater**

*Barley water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Barley.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)

See Also


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BEANCASoil

*Castor Beans soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Castor Beans.

**Format**

A data frame with 9 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%) 
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also


### BEANCATemp

*Castor Beans temp requirement for land evaluation*

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<th>Castor Beans temp requirement for land evaluation</th>
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**Description**

A dataset containing the temp characteristics of the crop requirements for farming Castor Beans.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmAv1 - Mean temp. of the initial stage (°C)

See Also

**BEANCATerrain**

*Castor Beans terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Castor Beans.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization.)
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork.)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)

**See Also**


---

**BEANCAWater**

*Castor Beans water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Castor Beans.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **WgAv** - Precipitation of growing cycle (mm)
- **WmhAv3** - Relative humidity of maturation Stage (%)
BEANSSoil

Description

A dataset containing the soil characteristics of the crop requirements for farming Beans.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

- Cfragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pH H2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


See Also

**BEANSTemp**

Beans temp requirement for land evaluation

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Beans.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TgMinAv - Mean min. temp. of growing cycle (°C)

**See Also**


---

**BEANSTerrain**

Beans terrain requirement for land evaluation

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Beans.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization. )
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)
See Also


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**BEANSWater**  
*Beans water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Beans.

**Format**

A data frame with 5 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **WgAv** - Precipitation of growing cycle (mm)
- **WmhAv2** - Relative humidity of devel. Stage (%)
- **WmhAv3** - Relative humidity of maturation Stage (%)
- **WmnN2** - n/N develop. Stage (2nd month)
- **WmnN4** - n/N maturation stage (4th month)

See Also


---

**CABBAGESoil**  
*Cabbage soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Cabbage.

**Format**

A data frame with 12 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol. %)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)  
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


### CABBAGETemp

**Cabbage temp requirement for land evaluation**

<table>
<thead>
<tr>
<th>CABBAGETemp</th>
<th>Cabbage temp requirement for land evaluation</th>
</tr>
</thead>
</table>

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Cabbage.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmAv0 - Mean temp. at germination (°C) (1st month)
- TdDiff - Temp difference day/night (°C)

See Also

CABBAGETerrain  
*Cabbage terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Cabbage.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)

**See Also**


CABBAGEWater  
*Cabbage water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Cabbage.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WghAv - Relative humidity growing cycle (%)
See Also


---

**CARROTSSoil**

*Carrots soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Carrots.

**Format**

A data frame with 11 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **CFragm** - Coarse fragment (Vol.%)
- **SoilDpt** - Soil depth (cm)
- **CaCO3** - CaCO3 (%)
- **Gyps** - Gypsum (%)
- **CECc** - Apparent CEC Clay (cmol (+)/kg clay)
- **BS** - Base Saturation (%)
- **SumBCs** - Sum of basic caions (cmol (+)/kg soil)
- **pHH2O** - pH H2O
- **OC** - Organic carbon (%)
- **ECedS** - ECe (dS/m)
- **ESP** - ESP (%)

**See Also**

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Carrots.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **TgAv** - Mean temperature of the growing cycle (°C)
- **TmAv0** - Mean temp. at germination (°C) (1st month)

**See Also**


---

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Carrots.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization.)
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork.)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)
See Also


**CARROTSWater**  
*Carrots water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Carrots.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WghAv - Relative humidity growing cycle (%)

See Also


**CASHEWSoil**  
*Cashew soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Cashew.

**Format**

A data frame with 8 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol. %)
- SoilDpt - Soil depth (cm)
- BS - Base Saturation (%)  
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also


<table>
<thead>
<tr>
<th>CASHEWTemp</th>
<th>Cashew temp requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the temp characteristics of the crop requirements for farming Cashew.

Format

A data frame with 2 rows and 8 columns

Details

The following are the factors for evaluation:

- TyMaxAv - Mean annual maximum temperature (°C)
- TmMinXm - Average minimum temperature of coldest month (°C)

See Also

**CASHEWTerrain**

*Cashew terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Cashew.

**Format**

A data frame with 8 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

**See Also**


**CASHEWWater**

*Cashew water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Cashew.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : $P < 1/2$ PET)
**CASSAVASoil**

**See Also**


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**CASSAVASoil**

**Cassava soil requirement for land evaluation**

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**Description**

A dataset containing the soil characteristics of the crop requirements for farming Cassava.

**Format**

A data frame with 12 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm1 - Coarse fragment in surface (Vol.%)
- CFragm2 - Coarse fragment in depth (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)  
- Gyps - Gypsum (%)  
- CECc - Apparent CEC Clay (cmol (+)/kg clay)  
- BS - Base Saturation (%)  
- SumBCs - Sum of basic caions (cmol (+)/kg soil)  
- pHH2O - pH H2O  
- OC - Organic carbon (%)  
- ECedS - ECe (dS/m)  
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

**See Also**

**CASSAVATemp**

*Cassava temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Cassava.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TyMaxAv - Mean annual maximum temperature (°C)
- TmMinXmAb - Absolute min temp. coldest month (°C)
- TgAv - Mean temperature of the growing cycle (°C)

**See Also**


**CASSAVATerrain**

*Cassava terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Cassava.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)
CHICKPEASoil

See Also


---

CASSAVAWater

Cassava water requirement for land evaluation

---

Description

A dataset containing the water characteristics of the crop requirements for farming Cassava.

Format

A data frame with 3 rows and 8 columns

Details

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)
- WmnN5 - n/N of the 5 dryest months

See Also


---

CHICKPEASoil

Chickpea soil requirement for land evaluation

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Description

A dataset containing the soil characteristics of the crop requirements for farming Chickpea.

Format

A data frame with 11 rows and 8 columns
CHICKPEATemp

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also


<table>
<thead>
<tr>
<th>CHICKPEATemp</th>
<th>Chickpea temp requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the temp characteristics of the crop requirements for farming Chickpea.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)

See Also

CHICKPEATerrain  

*Chickpea terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Chickpea.

**Format**

A data frame with 8 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization.
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork.)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)
- **SlopeD** - Slope (degree, 6 classes)
- **SoilTe** - 12 classes of soil texture (Soil Taxonomy)

**See Also**


CHICKPEAWater  

*Chickpea water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Chickpea.

**Format**

A data frame with 3 rows and 8 columns
Details

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)

See Also


CINAMONSoil

Cinnamon soil requirement for land evaluation

Description

A dataset containing the soil characteristics of the crop requirements for farming Cinnamon.

Format

A data frame with 9 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)  
- Gyps - Gypsum (%)  
- CECc - Apparent CEC Clay (cmol (+)/kg clay)  
- BS - Base Saturation (%)  
- SumBCs - Sum of basic caions (cmol (+)/kg soil)  
- pHH2O - pH H2O  
- OC - Organic carbon (%)

See Also

**CINNAMONTemp**  
*Cinnamon temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Cinnamon.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)

**See Also**


---

**CINNAMONTerrain**  
*Cinnamon terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Cinnamon.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- SlopeD - Slope (degree, 6 classes)
- Flood - Flooding

**See Also**

CINNAMONWater

Cinnamon water requirement for land evaluation

Description

A dataset containing the water characteristics of the crop requirements for farming Cinnamon.

Format

A data frame with 2 rows and 8 columns

Details

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WghAv - Relative humidity growing cycle (%)

See Also


CITRUSSoil

Citrus soil requirement for land evaluation

Description

A dataset containing the soil characteristics of the crop requirements for farming Citrus.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)  
- SoilDpt - Soil depth (cm)  
- CaCO3 - CaCO3 (%)  
- Gyps - Gypsum (%)  
- CECc - Apparent CEC Clay (cmol (+)/kg clay)  
- BS - Base Saturation (%)
• SumBCs - Sum of basic caions (cmol (+)/kg soil)
• pHH2O - pH H2O
• OC - Organic carbon (%)
• ECedS - ECe (dS/m)
• ESP - ESP (%)
• SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


CITRUSTemp

<table>
<thead>
<tr>
<th>CITRUSTemp</th>
<th>Citrus temp requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the temp characteristics of the crop requirements for farming Citrus.

Format

A data frame with 8 rows and 8 columns

Details

The following are the factors for evaluation:

• TyAv - Mean annual temperature (°C)
• TmMax38 - No of months with mean temp. > 38 °C
• TmMin13 - No of months with mean temp. < 13 °C
• TyMinAb - Absolute minimum temperature (°C)
• TyMinAb - Absolute minimum temperature (°C)
• TyMinAb - Absolute minimum temperature (°C)
• TyMinAb - Absolute minimum temperature (°C)
• TmAv3 - Mean temp. of the flowering stage (°C)

See Also

**CITRUSTerrain**

*Citrus terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Citrus.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)

**See Also**


---

**CITRUSWater**

*Citrus water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Citrus.

**Format**

A data frame with 5 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)
- WmhColdXm - Relative humidity of coldest month if frost (%)
- WmhAv4 - Relative humidity at harvest stage (%)
- WmhAv3 - Relative humidity of maturation Stage (%)

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See Also


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**COCOASoil**

*Cocoa soil requirement for land evaluation*

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**Description**

A dataset containing the soil characteristics of the crop requirements for farming Cocoa.

**Format**

A data frame with 10 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)

**See Also**

COCOATemp

Description
A dataset containing the temp characteristics of the crop requirements for farming Cocoa.

Format
A data frame with 3 rows and 8 columns

Details
The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)
- TyMaxAv - Mean annual maximum temperature (°C)
- TyMaxAv - Mean annual maximum temperature (°C)

See Also

COCOATerrain

Description
A dataset containing the terrain characteristics of the crop requirements for farming Cocoa.

Format
A data frame with 5 rows and 8 columns

Details
The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage
COCONUTSoil

See Also


COCOAWater

Description

A dataset containing the water characteristics of the crop requirements for farming Cocoa.

Format

A data frame with 4 rows and 8 columns

Details

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months: P < 1/2 PET)
- WmhDryXm - Mean rel. humidity dryest month (%)
- WmhDryXm - Mean rel. humidity dryest month (%)

See Also


COCONUTSoil

Description

A dataset containing the soil characteristics of the crop requirements for farming Coconut.

Format

A data frame with 6 rows and 8 columns
Details

The following are the factors for evaluation:

- **CFragm** - Coarse fragment (Vol. %)
- **SoilDpt** - Soil depth (cm)
- **BS** - Base Saturation (%)
- **SumBCs** - Sum of basic cations (cmol (+)/kg soil)
- **OC** - Organic carbon (%)
- **ECemh** - ECe (mmhos/cm)

See Also


<table>
<thead>
<tr>
<th>COCONUTTemp</th>
<th>Coconut temp requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the temp characteristics of the crop requirements for farming Coconut.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

- **TyAv** - Mean annual temperature (°C)

See Also

COCONUTTerrain

Description
A dataset containing the terrain characteristics of the crop requirements for farming Coconut.

Format
A data frame with 5 rows and 8 columns

Details
The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage

See Also

COCONUTWater

Description
A dataset containing the water characteristics of the crop requirements for farming Coconut.

Format
A data frame with 3 rows and 8 columns

Details
The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)
- WyhAv - Mean annual rel. humidity (%)
COFFEEARSoil

See Also


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COFFEEARSoil

| Arabica Coffee soil requirement for land evaluation |

Description

A dataset containing the soil characteristics of the crop requirements for farming Arabica Coffee.

Format

A data frame with 11 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

Description

A dataset containing the temp characteristics of the crop requirements for farming Arabica Coffee.

Format

A data frame with 3 rows and 8 columns

Details

The following are the factors for evaluation:

- TyMaxAv - Mean annual maximum temperature (°C)
- TdMinXm - Mean daily minimum temperature of coldest month (°C)
- TyAv - Mean annual temperature (°C)

See Also


Description

A dataset containing the terrain characteristics of the crop requirements for farming Arabica Coffee.

Format

A data frame with 6 rows and 8 columns

Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization. )
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)
### COFFEEARWater

<table>
<thead>
<tr>
<th>Arabica Coffee water requirement for land evaluation</th>
</tr>
</thead>
</table>

#### Description

A dataset containing the water characteristics of the crop requirements for farming Arabica Coffee.

#### Format

A data frame with 4 rows and 8 columns

#### Details

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)
- WmhDryXm - Mean rel. humidity dryest month (%)
- WmnN5 - n/N of the 5 dryest months

#### See Also


### COFFEEEROSoil

<table>
<thead>
<tr>
<th>Robusta Coffee soil requirement for land evaluation</th>
</tr>
</thead>
</table>

#### Description

A dataset containing the soil characteristics of the crop requirements for farming Robusta Coffee.

#### Format

A data frame with 10 rows and 8 columns

#### See Also

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol. %)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)

See Also


### COFFEEROTemp

**Robusta Coffee temp requirement for land evaluation**

<table>
<thead>
<tr>
<th>COFFEEROTemp</th>
<th>Robusta Coffee temp requirement for land evaluation</th>
</tr>
</thead>
</table>

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Robusta Coffee.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)
- TyMaxAv - Mean annual maximum temperature (°C)
- TdMinXm - Mean daily minimum temperature of coldest month (°C)

See Also

COFFEEROTerrain  Robusta Coffee terrain requirement for land evaluation

Description
A dataset containing the terrain characteristics of the crop requirements for farming Robusta Coffee.

Format
A data frame with 5 rows and 8 columns

Details
The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage

See Also

COFFEEROWater  Robusta Coffee water requirement for land evaluation

Description
A dataset containing the water characteristics of the crop requirements for farming Robusta Coffee.

Format
A data frame with 4 rows and 8 columns

Details
The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : $P < 1/2$ PET)
- WmhDryXm - Mean rel. humidity dryest month (%)
- WmnN5 - n/N of the 5 dryest months
See Also


<table>
<thead>
<tr>
<th>COTTONSoil</th>
<th>Cotton soil requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the soil characteristics of the crop requirements for farming Cotton.

Format

A data frame with 13 rows and 8 columns

Details

The following are the factors for evaluation:

- **Cfragm** - Coarse fragment (Vol.%)
- **SoilDpt** - Soil depth (cm)
- **CaCO3** - CaCO3 (%)  
- **Gyps** - Gypsum (%)
- **CECc** - Apparent CEC Clay (cmol (+)/kg clay)
- **BS** - Base Saturation (%)  
- **SumBCs** - Sum of basic cations (cmol (+)/kg soil)
- **pHH2O** - pH H2O
- **OC6** - Organic carbon (%) - Kaolinitic materials
- **OC7** - Organic carbon (%) - Non Kaolinitic, Non calcareous materials
- **OC8** - Organic carbon (%) - Calcareous materials
- **ECemb** - ECe (mmhos/cm)
- **SoilTe** - 12 classes of soil texture (Soil Taxonomy)

See Also

### Cotton Temp

#### Description

A dataset containing the temp characteristics of the crop requirements for farming Cotton.

#### Format

A data frame with 6 rows and 8 columns

#### Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TgMaxAv - Mean max temp. of growing cycle (°C)
- TmMaxXm - Average max. temp. warmest month (°C)
- TmAv2 - Mean temp. crop development stage (2nd month) (°C)
- TdAvg3 - Mean DAY temp. of flowering stage (°C)
- TdMinN3 - Mean Night temp. of flowering stage (°C)

#### See Also


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### Cotton Terrain

#### Description

A dataset containing the terrain characteristics of the crop requirements for farming Cotton.

#### Format

A data frame with 7 rows and 8 columns
Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- Slope - nan

See Also


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COTTONWater

Cotton water requirement for land evaluation

Description

A dataset containing the water characteristics of the crop requirements for farming Cotton.

Format

A data frame with 6 rows and 8 columns

Details

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv5 - Mean precipitation of fifth month (mm)
- WmAv6 - Precipitation of ripening stage (mm)(6th month)
- WmhAv3 - Relative humidity of maturation Stage (%)

See Also

**COWPEASoil**

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Cowpea.

**Format**

A data frame with 11 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pH\textsubscript{H2O} - pH H2O
- OC - Organic carbon (%)
- EC\textsubscript{edS} - EC\textsubscript{e} (dS/m)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

**See Also**


---

**COWPEATemp**

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Cowpea.

**Format**

A data frame with 3 rows and 8 columns
Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmAv0 - Mean temp. at germination (°C) (1st month)
- TyMinAv - Mean annual minimum temperature (°C)

See Also


---

**COWPEATerrain**

**Cowpea terrain requirement for land evaluation**

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Cowpea.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)

See Also

**COWPEAWater**

*Cowpea water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Cowpea.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)
- WmhAv4 - Relative humidity at harvest stage (%)

**See Also**


---

**CUCUMBERSoil**

*Cucumber soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Cucumber.

**Format**

A data frame with 10 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


---

**CUCUMBERTemp**

<table>
<thead>
<tr>
<th>CUCUMBERTemp</th>
<th>Cucumber temp requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the temp characteristics of the crop requirements for farming Cucumber.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)

See Also

CUCUMBERTerrain  

Cucumber terrain requirement for land evaluation

Description
A dataset containing the terrain characteristics of the crop requirements for farming Cucumber.

Format
A data frame with 7 rows and 8 columns

Details
The following are the factors for evaluation:

- SlopeD - Slope (degree, 6 classes)
- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)

See Also

CUCUMBERWater  

Cucumber water requirement for land evaluation

Description
A dataset containing the water characteristics of the crop requirements for farming Cucumber.

Format
A data frame with 2 rows and 8 columns

Details
The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WghAv - Relative humidity growing cycle (%)
GROUNDNUTSSoil

See Also


GROUNDNUTSSoil

*Groundnuts soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Groundnuts.

**Format**

A data frame with 15 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECS - Apparent CEC Soil (cmol (+)/kg soil)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pH2O - pH H2O
- OC6 - Organic carbon (%) - Kaolinitic materials
- OC7 - Organic carbon (%) - Non Kaolinitic, Non calcareous materials
- OC8 - Organic carbon (%) - Calcareous materials
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- OC - Organic carbon (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

**GROUNDNUTSTemp**

*Groundnuts temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Groundnuts.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TgMaxAv - Mean max temp. of growing cycle (°C)
- TgMinAv - Mean min. temp. of growing cycle (°C)

**See Also**


---

**GROUNDNUTSTerrain**

*Groundnuts terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Groundnuts.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)
See Also


---

**GROUNDNUTSWater**

*Groundnuts water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Groundnuts.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **WgAv** - Precipitation of growing cycle (mm)
- **WmAv1** - Mean precipitation of first month (mm)
- **WmAv2** - Mean precipitation of second month (mm)
- **WmAv3** - Mean precipitation of third month (mm)
- **WmAv4** - Mean precipitation of fourth month (mm)
- **WghAv** - Relative humidity growing cycle (%)

**See Also**


---

**GUAVASoil**

*Guava soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Guava.

**Format**

A data frame with 9 rows and 8 columns
GUAVATemp

Details

The following are the factors for evaluation:

• CFragm - Coarse fragment (Vol.%)
• SoilDpt - Soil depth (cm)
• CECc - Apparent CEC Clay (cmol (+)/kg clay)
• BS - Base Saturation (%)
• SumBCs - Sum of basic caions (cmol (+)/kg soil)
• pHH2O - pH H2O
• OC - Organic carbon (%)
• ECedS - ECe (dS/m)
• ESP - ESP (%)

See Also


---

GUAVATemp

Guava temp requirement for land evaluation

---

Description

A dataset containing the temp characteristics of the crop requirements for farming Guava.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

• TyAv - Mean annual temperature (°C)

See Also

GUAVATerrain

Guava terrain requirement for land evaluation

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Guava.

**Format**

A data frame with 5 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage - Drainage

**See Also**


---

GUAVAWater

Guava water requirement for land evaluation

**Description**

A dataset containing the water characteristics of the crop requirements for farming Guava.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)

**See Also**

**LaoCaiLT**

**Land and Terrain Characteristics of Lao Cai, Vietnam**

**Description**

A dataset containing the land and terrain characteristics of the land units in Lao Cai, Vietnam.

**Format**

A data frame with 2928 rows and 10 columns

**Details**

- SlopeD - Slope (degree, 6 classes);
- CFragm - Coarse fragment (Vol.%);
- SoilDpt - Soil depth (cm);
- SoilTe - 12 classes of soil texture (Soil Taxonomy);
- CECc - Apparent CEC Clay (cmol (+)/kg clay);
- SumBCs - Sum of basic caions (cmol (+)/kg soil);
- pH20 - pH H2O;
- BS - Base Saturation (%);
- OC - Organic carbon (%);
- Flood - Flooding;

---

**LaoCaiTemp**

**Temperature Characteristics of Lao Cai, Vietnam**

**Description**

A dataset containing the temperature characteristics of the land units in Lao Cai, Vietnam.

**Format**

A data frame with 2928 rows and 12 columns
Details

• Jan - January;
• Feb - February;
• Mar - March;
• Apr - April;
• May - May;
• Jun - June;
• Jul - July;
• Aug - August;
• Sep - September;
• Oct - October;
• Nov - November;
• Dec - December;

LaoCaiWater | Water Characteristics of Lao Cai, Vietnam

Description

A dataset containing the water characteristics of the land units in Lao Cai, Vietnam.

Format

A data frame with 2928 rows and 12 columns

Details

• Jan - January;
• Feb - February;
• Mar - March;
• Apr - April;
• May - May;
• Jun - June;
• Jul - July;
• Aug - August;
• Sep - September;
• Oct - October;
• Nov - November;
• Dec - December;
Description

A dataset containing the soil characteristics of the crop requirements for farming Longan.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

**LONGANTemp**

*Longan temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Longan.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)
- TdMinXm - Mean daily minimum temperature of coldest month (°C)
- TyMinAv - Mean annual minimum temperature (°C)

**See Also**


---

**LONGANTerrain**

*Longan terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Longan.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)
See Also


---

**Description**

A dataset containing the water characteristics of the crop requirements for farming Longan.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)

See Also


---

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Maize.

**Format**

A data frame with 15 rows and 8 columns
Details

The following are the factors for evaluation:

- **CFragm** - Coarse fragment (Vol.%)
- **SoilDpt** - Soil depth (cm)
- **CaCO3** - CaCO3 (%)
- **Gyps** - Gypsum (%)
- **CECc** - Apparent CEC Clay (cmol (+)/kg clay)
- **BS** - Base Saturation (%)
- **SumBCs** - Sum of basic caions (cmol (+)/kg soil)
- **pHH2O** - pH H2O
- **OC6** - Organic carbon (%) - Kaolinitic materials
- **OC7** - Organic carbon (%) - Non Kaolinitic, Non calcareous materials
- **OC8** - Organic carbon (%) - Calcareous materials
- **ECedS** - ECe (dS/m)
- **ESP** - ESP (%)
- **OC** - Organic carbon (%)
- **SoilTe** - 12 classes of soil texture (Soil Taxonomy)

See Also


---

**MAIZETemp**

*Maize temp requirement for land evaluation*

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Description

A dataset containing the temp characteristics of the crop requirements for farming Maize.

Format

A data frame with 2 rows and 8 columns

Details

The following are the factors for evaluation:

- **TgAv** - Mean temperature of the growing cycle (°C)
- **TgMinAv** - Mean min. temp. of growing cycle (°C)

See Also

MAIZETerrain  

Maize terrain requirement for land evaluation

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Maize.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)

**See Also**


---

MAIZEWater  

Maize water requirement for land evaluation

**Description**

A dataset containing the water characteristics of the crop requirements for farming Maize.

**Format**

A data frame with 9 rows and 8 columns
Details

The following are the factors for evaluation:

- $\text{WgAv}$ - Precipitation of growing cycle (mm)
- $\text{WmAv1}$ - Mean precipitation of first month (mm)
- $\text{WmAv2}$ - Mean precipitation of second month (mm)
- $\text{WmAv3}$ - Mean precipitation of third month (mm)
- $\text{WmAv4}$ - Mean precipitation of fourth month (mm)
- $\text{WmhAv2}$ - Relative humidity of development stage (%)
- $\text{WmhAv3}$ - Relative humidity of maturation stage (%)
- $\text{WmnN2}$ - n/N development stage (2nd month)
- $\text{WmnN4}$ - n/N maturation stage (4th month)

See Also


---

MANGOSoil

Mango soil requirement for land evaluation

Description

A dataset containing the soil characteristics of the crop requirements for farming Mango.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

- $\text{CFragm}$ - Coarse fragment (Vol.%)
- $\text{SoilDpt}$ - Soil depth (cm)
- $\text{CaCO3}$ - CaCO3 (%)
- $\text{Gyps}$ - Gypsum (%)
- $\text{CECc}$ - Apparent CEC Clay (cmol (+)/kg clay)
- $\text{BS}$ - Base Saturation (%)
- $\text{SumBCc}$ - Sum of basic cations (cmol (+)/kg of clay)
- $\text{pHH2O}$ - pH H2O
- $\text{OC}$ - Organic carbon (%)
- $\text{ECedS}$ - ECe (dS/m)
- $\text{ESP}$ - ESP (%)
- $\text{SoilTe}$ - 12 classes of soil texture (Soil Taxonomy)
MANGOTemp

See Also


MANGOTemp  
Mango temp requirement for land evaluation

Description

A dataset containing the temp characteristics of the crop requirements for farming Mango.

Format

A data frame with 2 rows and 8 columns

Details

The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)
- TyMinAv - Mean annual minimum temperature (°C)

See Also


MANGOTerrain  
Mango terrain requirement for land evaluation

Description

A dataset containing the terrain characteristics of the crop requirements for farming Mango.

Format

A data frame with 6 rows and 8 columns

Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1) Basin furrow irrigation
- Slope2 - Slope (%) (2) Mechanized, high management level
- Slope3 - Slope (%) (3) Manual, low management level
- Flood - Flooding
- Drainage - Drainage
- SlopeD - 6 classes of slope (Degree)
See Also


---

**MANGOWater**  
*Mango water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Mango.

**Format**

A data frame with 5 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **WyAv** - Annual precipitation (mm)
- **WmDryLen** - Length dry season (months : P < 1/2 PET)
- **WmAvDry** - Monthly precipitation during dry season (mm)
- **WyhAv** - Mean annual rel. humidity (%)
- **WmnN4** - n/N maturation stage (4th month)

---

See Also


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**MarinduqueLT**  
*Land and Terrain Characteristics of Marinduque, Philippines*

**Description**

A dataset containing the land and terrain characteristics of the land units in Marinduque, Philippines.

**Format**

A data frame with 881 rows and 6 columns
MarinduqueTemp

Details

- Lat - Latitude of Land Units;
- Lon - Longitude of Land Units;
- CECc - Apparent CEC Clay (cmol (+)/kg clay);
- pH20 - pH H2O;
- CFragm - Coarse fragment (Vol.%);
- SoilTe - 12 classes of soil texture (Soil Taxonomy);

---

MarinduqueTemp

Temperature Characteristics of Marinduque, Philippines

Description

A dataset containing the temperature characteristics of the land units in Marinduque, Philippines.

Format

A data frame with 881 rows and 14 columns

Details

- Lat - Latitude of Land Units;
- Lon - Longitude of Land Units;
- Jan - January;
- Feb - February;
- Mar - March;
- Apr - April;
- May - May;
- Jun - June;
- Jul - July;
- Aug - August;
- Sep - September;
- Oct - October;
- Nov - November;
- Dec - December;
### MarinduqueWater

**Water Characteristics of Marinduque, Philippines**

**Description**

A dataset containing the water characteristics of the land units in Marinduque, Philippines.

**Format**

A data frame with 881 rows and 14 columns

**Details**

- Lat - Latitude of Land Units;
- Lon - Longitude of Land Units;
- Jan - January;
- Feb - February;
- Mar - March;
- Apr - April;
- May - May;
- Jun - June;
- Jul - July;
- Aug - August;
- Sep - September;
- Oct - October;
- Nov - November;
- Dec - December;

### MILLETSSoil

**Millets soil requirement for land evaluation**

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Millets.

**Format**

A data frame with 11 rows and 8 columns
Details

The following are the factors for evaluation:

- **CFragm** - Coarse fragment (Vol.%)
- **SoilDpt** - Soil depth (cm)
- **CaCO3** - CaCO3 (%) 
- **Gyps** - Gypsum (%)
- **CECc** - Apparent CEC Clay (cmol (+)/kg clay)
- **BS** - Base Saturation (%)
- **SumBCs** - Sum of basic cations (cmol (+)/kg soil)
- **pHH2O** - pH H2O
- **OC6** - Organic carbon (%) - Kaolinitic materials
- **ECedS** - ECe (dS/m)
- **ESP** - ESP (%)

See Also


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### MILLETSTemp

**Millets temp requirement for land evaluation**

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Millets.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **TgAv** - Mean temperature of the growing cycle (°C)
- **TgMaxAv** - Mean max temp. of growing cycle (°C)
- **TgMinAv** - Mean min. temp. of growing cycle (°C)

See Also

MILLETS Terrain

Description
A dataset containing the terrain characteristics of the crop requirements for farming Millets.

Format
A data frame with 6 rows and 8 columns

Details
The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)

See Also


MILLETS Water

Description
A dataset containing the water characteristics of the crop requirements for farming Millets.

Format
A data frame with 5 rows and 8 columns

Details
The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)
- WmHAv4 - Relative humidity at harvest stage (%)
See Also


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**OILPALMSoil**

*Oil Palm soil requirement for land evaluation*

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**Description**

A dataset containing the soil characteristics of the crop requirements for farming Oil Palm.

**Format**

A data frame with 10 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm2 - Coarse fragment in depth (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - E (dS/m)

See Also

**OILPALMTemp**

*Oil Palm temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Oil Palm.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TyMaxAv - Mean annual maximum temperature (°C)
- TdMinXm - Mean daily minimum temperature of coldest month (°C)
- TyAv - Mean annual temperature (°C)

**See Also**


---

**OILPALMTerrain**

*Oil Palm terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Oil Palm.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope - Slope
- Flood - Flooding
- Drainage4 - Drainage (4) Medium & fine textured soils
- Drainage5 - Drainage (5) Coarse textured soils

**See Also**

**OILPALMWater**

**Oil Palm water requirement for land evaluation**

**Description**

A dataset containing the water characteristics of the crop requirements for farming Oil Palm.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)
- WynN - Mean annual n/N

**See Also**


---

**OLIVESSoil**

**Olives soil requirement for land evaluation**

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Olives.

**Format**

A data frame with 10 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
• SumBCs - Sum of basic cations (cmol (+)/kg soil)
• pH H2O - pH H2O
• OC - Organic carbon (%)
• ECedS - ECe (dS/m)
• ESP - ESP (%)

See Also


---

**OLIVESTemp**

| OLIVESTemp | Olives temp requirement for land evaluation |

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Olives.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

• TyAv - Mean annual temperature (°C)
• TmMinXm - Average minimum temperature of coldest month (°C)

See Also

OLIVESTerrain

Description
A dataset containing the terrain characteristics of the crop requirements for farming Olives.

Format
A data frame with 6 rows and 8 columns

Details
The following are the factors for evaluation:
- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)

See Also

OLIVESWater

Description
A dataset containing the water characteristics of the crop requirements for farming Olives.

Format
A data frame with 3 rows and 8 columns

Details
The following are the factors for evaluation:
- WyAv - Annual precipitation (mm)
- WmSpecial1 - Monthly rainfall during the sclerification of stone (mm) - August (N hem) February (S hem)
- WmSpecial2 - Monthly rainfall during the sclerification of stone (mm) - September (N hem) March (S hem)
ONIONSoil

Description

A dataset containing the soil characteristics of the crop requirements for farming Onion.

Format

A data frame with 11 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol. %)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%) 
- Gyps - Gypsum (%) 
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%) 
- SumBCs - Sum of basic caions (cmol (+)/kg soil) 
- pHH2O - pH H2O
- OC - Organic carbon (%) 
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also


See Also

**ONIONTemp**  
*Onion temp requirement for land evaluation*

**Description**
A dataset containing the temp characteristics of the crop requirements for farming Onion.

**Format**
A data frame with 2 rows and 8 columns

**Details**
The following are the factors for evaluation:

- **TgAv** - Mean temperature of the growing cycle (°C)
- **TmAv0** - Mean temp. at germination (°C) (1st month)

**See Also**

---

**ONIONTerrain**  
*Onion terrain requirement for land evaluation*

**Description**
A dataset containing the terrain characteristics of the crop requirements for farming Onion.

**Format**
A data frame with 6 rows and 8 columns

**Details**
The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization.)
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork.)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)
See Also


---

**ONIONWater**

*Onion water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Onion.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- TmAvDlen3 - Daylength (h) during yield form. Period

See Also


---

**overall_suit**

*Overall Suitability Scores/Class of the Land Units*

**Description**

This function computes the overall suitability scores and class of the land units.

**Usage**

```r
overall_suit(suit, method = NULL, interval = NULL)
```
Arguments

suit an object of class suitability.
method a character for the method for computing the overall suitability, choices are: "minimum", "maximum", and "average". If NULL, method is set to "minimum".
interval if NULL, the interval of the suitability class are the following: 0% - 25% (Not suitable, N), 25% - 50% (Marginally Suitable, S3), 50% - 75% (Moderately Suitable, S2), and 75% - 100% (Highly Suitable, S1). But users can assign custom intervals by specifying the values of the end points of the intervals. Say for intervals: 0% - 20% (Not suitable, N), 20% - 50% (Marginally Suitable, S3), 50% - 80% (Moderately Suitable, S2), and 80% - 100% (Highly Suitable, S1), is equivalent to interval = c(0, 0.2, 0.5, 0.8, 1).

Value

A data frame with columns:

- Score - the overall suitability scores
- Class - the overall suitability classes

See Also

suit, https://alstat.github.io/ALUES/

Examples

library(ALUES)
out <- suit("ricebr", terrain=MarinduqueLT, water=MarinduqueWater, temp=MarinduqueTemp, sow_month=1)
out[["terrain"]]

# Soil Overall Suitability
head(overall_suit(out[["soil"]]))
head(overall_suit(out[["soil"]], "average"))
head(overall_suit(out[["soil"]], "maximum"))
head(overall_suit(out[["soil"]], "average", c(0, 0.3, 0.35, 0.6, 1.0)))

# Water Overall Suitability
head(overall_suit(out[["water"]], "average"))
head(overall_suit(out[["water"]], "maximum"))
head(overall_suit(out[["water"]], "average", c(0, 0.3, 0.35, 0.6, 1.0)))

# Temperature Overall Suitability
head(overall_suit(out[["temp"]], "average"))
head(overall_suit(out[["temp"]], "maximum"))
head(overall_suit(out[["temp"]], "average", c(0, 0.3, 0.35, 0.6, 1.0)))
PAPAYASoil

**Papaya soil requirement for land evaluation**

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Papaya.

**Format**

A data frame with 9 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)

**See Also**


---

PAPAYATemp

**Papaya temp requirement for land evaluation**

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Papaya.

**Format**

A data frame with 2 rows and 8 columns
PAPAYATerrain

Details
The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)
- TyMinAv - Mean annual minimum temperature (°C)

See Also

PAPAYATerrain Papaya terrain requirement for land evaluation

Description
A dataset containing the terrain characteristics of the crop requirements for farming Papaya.

Format
A data frame with 0 rows and 8 columns

Details
The following are the factors for evaluation:

See Also

PAPAYAWater Papaya water requirement for land evaluation

Description
A dataset containing the water characteristics of the crop requirements for farming Papaya.

Format
A data frame with 3 rows and 8 columns
Details

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WynN - Mean annual n/N
- WyhAv - Mean annual rel. humidity (%)

See Also


---

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Peach.

**Format**

A data frame with 12 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

**PEACHTemp**

_Peach temp requirement for land evaluation_

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Peach.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **TyAv** - Mean annual temperature (°C)

**See Also**


---

**PEACHTerrain**

_Peach terrain requirement for land evaluation_

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Peach.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization.)
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork.)
- **Flood** - Flooding
- **Drainage** - Drainage
- **SlopeD** - Slope (degree, 6 classes)

**See Also**

PEACHWater

Peach water requirement for land evaluation

Description
A dataset containing the water characteristics of the crop requirements for farming Peach.

Format
A data frame with 1 rows and 8 columns

Details
The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)

See Also


PEARSoil

Pear soil requirement for land evaluation

Description
A dataset containing the soil characteristics of the crop requirements for farming Pear.

Format
A data frame with 12 rows and 8 columns

Details
The following are the factors for evaluation:

- Cfragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)  
- Gyps - Gypsum (%)  
- CECc - Apparent CEC Clay (cmol (+)/kg clay)  
- BS - Base Saturation (%)  
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
**PEARTemp**

- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


---

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Pear.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)

See Also


---

**PEARTerrain**

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Pear.

**Format**

A data frame with 6 rows and 8 columns
Details

The following are the factors for evaluation:

• Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
• Slope2 - Slope (%) (2. High level of management with full mechanization.)
• Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
• Flood - Flooding
• Drainage - Drainage
• SlopeD - Slope (degree, 6 classes)

See Also


Description

A dataset containing the water characteristics of the crop requirements for farming Pear.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

• WyAv - Annual precipitation (mm)

See Also

**PEASoil**

*Pea soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Pea.

**Format**

A data frame with 11 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)  
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

**See Also**


---

**PEATemp**

*Pea temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Pea.

**Format**

A data frame with 2 rows and 8 columns
Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmMinAv0 - Mean min. temp. at germination (°C)

See Also


---

| PEATerrain | Pea terrain requirement for land evaluation |

Description

A dataset containing the terrain characteristics of the crop requirements for farming Pea.

Format

A data frame with 7 rows and 8 columns

Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)

See Also

**PEAWater**  
*Pea water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Pea.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- *WgAv* - Precipitation of growing cycle (mm)

**See Also**


---

**PEPPERGRSoil**  
*Green Pepper soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Green Pepper.

**Format**

A data frame with 11 rows and 8 columns

**Details**

The following are the factors for evaluation:

- *CFragm* - Coarse fragment (Vol.%)
- *SoilDpt* - Soil depth (cm)
- *CaCO3* - CaCO3 (%)  
- *Gyps* - Gypsum (%)  
- *CECc* - Apparent CEC Clay (cmol (+)/kg clay)  
- *BS* - Base Saturation (%)  
- *SumBCs* - Sum of basic caions (cmol (+)/kg soil)
• pH2O - pH H2O
• OC - Organic carbon (%)
• ECedS - ECe (dS/m)
• SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


<table>
<thead>
<tr>
<th>PEPPERGRTemp</th>
<th>Green Pepper temp requirement for land evaluation</th>
</tr>
</thead>
</table>

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Green Pepper.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

• TgAv - Mean temperature of the growing cycle (°C)
• TmAv0 - Mean temp. at germination (°C) (1st month)

**See Also**


<table>
<thead>
<tr>
<th>PEPPERGRTerrain</th>
<th>Green Pepper terrain requirement for land evaluation</th>
</tr>
</thead>
</table>

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Green Pepper.

**Format**

A data frame with 7 rows and 8 columns
Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- Slope - nan

See Also


<table>
<thead>
<tr>
<th>PEPPERGRWater</th>
<th>Green Pepper water requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the water characteristics of the crop requirements for farming Green Pepper.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)

See Also


**Description**

A dataset containing the soil characteristics of the crop requirements for farming Persimmon.

**Format**

A data frame with 12 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **CFragm** - Coarse fragment (Vol.%)
- **SoilDpt** - Soil depth (cm)
- **CaCO3** - CaCO3 (%)
- **Gyps** - Gypsum (%)
- **CECc** - Apparent CEC Clay (cmol (+)/kg clay)
- **BS** - Base Saturation (%)
- **SumBCs** - Sum of basic cations (cmol (+)/kg soil)
- **pHH2O** - pH H2O
- **OC** - Organic carbon (%)
- **ECedS** - ECE (dS/m)
- **ESP** - ESP (%)
- **SoilTe** - 12 classes of soil texture (Soil Taxonomy)

**See Also**

Description

A dataset containing the temp characteristics of the crop requirements for farming Persimmon.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

• TgAv - Mean temperature of the growing cycle (°C)

See Also


Description

A dataset containing the terrain characteristics of the crop requirements for farming Persimmon.

Format

A data frame with 6 rows and 8 columns

Details

The following are the factors for evaluation:

• Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
• Slope2 - Slope (%) (2. High level of management with full mechanization.)
• Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
• Flood - Flooding
• Drainage - Drainage
• SlopeD - Slope (degree, 6 classes)

See Also

Description

A dataset containing the water characteristics of the crop requirements for farming Persimmon.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

• WyAv - Annual precipitation (mm)

See Also


Description

A dataset containing the soil characteristics of the crop requirements for farming Pineapple.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

• CFragm - Coarse fragment (Vol. %)
• SoilDpt - Soil depth (cm)
• CaCO3 - CaCO3 (%)  
• Gyps - Gypsum (%)  
• CECc - Apparent CEC Clay (cmol (+)/kg clay)  
• BS - Base Saturation (%)  
• SumBCs - Sum of basic caions (cmol (+)/kg soil)
PINEAPPLETemp

- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


Table: PINEAPPLETemp

| PINEAPPLETemp | Pineapple temp requirement for land evaluation |

Description

A dataset containing the temp characteristics of the crop requirements for farming Pineapple.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)

See Also


Table: PINEAPPLETerrain

| PINEAPPLETerrain | Pineapple terrain requirement for land evaluation |

Description

A dataset containing the terrain characteristics of the crop requirements for farming Pineapple.

Format

A data frame with 7 rows and 8 columns
Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)

See Also


---

**PINEAPPLEWater**  
Pineapple water requirement for land evaluation

<table>
<thead>
<tr>
<th>PINEAPPLEWater</th>
<th>Pineapple water requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the water characteristics of the crop requirements for farming Pineapple.

Format

A data frame with 2 rows and 8 columns

Details

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WyhAv - Mean annual rel. humidity (%)

See Also

Description

A dataset containing the soil characteristics of the crop requirements for farming Plum.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

PLUMTemp

Plum temp requirement for land evaluation

Description

A dataset containing the temp characteristics of the crop requirements for farming Plum.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

• TyAv - Mean annual temperature (°C)

See Also


PLUMTerrain

Plum terrain requirement for land evaluation

Description

A dataset containing the terrain characteristics of the crop requirements for farming Plum.

Format

A data frame with 6 rows and 8 columns

Details

The following are the factors for evaluation:

• Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
• Slope2 - Slope (%) (2. High level of management with full mechanization.)
• Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
• Flood - Flooding
• Drainage - Drainage
• SlopeD - Slope (degree, 6 classes)

See Also

**PLUMWater**

*Plum water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Plum.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)

**See Also**


---

**POTATOSoil**

*Potato soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Potato.

**Format**

A data frame with 12 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Cfragm - Coarse fragment (Vol.%)
- Soildpt1 - Surface Soil Depth (cm)
- Soildpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Cecc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
• pHH2O - pH H2O
• OC - Organic carbon (%)
• ECedS - ECe (dS/m)
• ESP - ESP (%)
• SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


---

**POTATOSWSoil**

Sweet Potato soil requirement for land evaluation

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Sweet Potato.

**Format**

A data frame with 12 rows and 8 columns

**Details**

The following are the factors for evaluation:

• CFragm - Coarse fragment (Vol.%)
• SoilDpt - Soil depth (cm)
• CaCO3 - CaCO3 (%)
• Gyps - Gypsum (%)
• CECc - Apparent CEC Clay (cmol (+)/kg clay)
• BS - Base Saturation (%)
• SumBCs - Sum of basic caions (cmol (+)/kg soil)
• pHH2O - pH H2O
• OC - Organic carbon (%)
• ECedS - ECe (dS/m)
• ESP - ESP (%)
• SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

**POTATOSWTemp**

**Sweet Potato temp requirement for land evaluation**

**Description**
A dataset containing the temp characteristics of the crop requirements for farming Sweet Potato.

**Format**
A data frame with 2 rows and 8 columns

**Details**
The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TgMinAv - Mean min. temp. of growing cycle (°C)

**See Also**

---

**POTATOSWTerrain**

**Sweet Potato terrain requirement for land evaluation**

**Description**
A dataset containing the terrain characteristics of the crop requirements for farming Sweet Potato.

**Format**
A data frame with 7 rows and 8 columns

**Details**
The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)
See Also


---

**POTATOSWWater**

*Sweet Potato water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Sweet Potato.

**Format**

A data frame with 5 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : P < 1/2 PET)
- WmhAv4 - Relative humidity at harvest stage (%)
- WmnN2 - n/N develop. Stage (2nd month)
- WmnN4 - n/N maturation stage (4th month)

See Also


---

**POTATOTemp**

*Potato temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Potato.

**Format**

A data frame with 4 rows and 8 columns
Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmMinAv1 - Average absolute Min. temperature of the first month (°C)
- TmMinAv4 - Average absolute Min. temperature of other months (°C)
- TdAvgDiff - Average Temperature difference between day-night (°C)

See Also


POTATOTerrain

Potato terrain requirement for land evaluation

Description

A dataset containing the terrain characteristics of the crop requirements for farming potato.

Format

A data frame with 7 rows and 8 columns

Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)

See Also

POTATOWater

Potato water requirement for land evaluation

Description

A dataset containing the water characteristics of the crop requirements for farming Potato.

Format

A data frame with 5 rows and 8 columns

Details

The following are the factors for evaluation:

- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)
- TgAvDlen - Average daylength growing cycle (h)

See Also


RICEBRSoil

Rainfed Bunded Rice soil requirement for land evaluation

Description

A dataset containing the soil characteristics of the crop requirements for farming Rainfed Bunded Rice.

Format

A data frame with 6 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)

See Also


| RICEBRTemp | Rainfed Bunded Rice temp requirement for land evaluation |

Description

A dataset containing the temp characteristics of the crop requirements for farming Rainfed Bunded Rice.

Format

A data frame with 4 rows and 8 columns

Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmMaxXm - Average max. temp. warmest month (°C)
- TmA2 - Mean temp. crop development stage (2nd month) (°C)
- TmMinAv4 - Average absolut Min. temperature of other months (°C)

See Also

Description

A dataset containing the terrain characteristics of the crop requirements for farming Rainfed Bunded Rice.

Format

A data frame with 3 rows and 8 columns

Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Flood - Flooding
- Drainage - Drainage

See Also


Description

A dataset containing the water characteristics of the crop requirements for farming Rainfed Bunded Rice.

Format

A data frame with 7 rows and 8 columns

Details

The following are the factors for evaluation:

- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)
RICEIWSOil

- WmhAv2 - Relative humidity of devel. Stage (%)
- WmhAv4 - Relative humidity at harvest stage (%)
- WynN - Mean annual n/N

See Also


RICEIWSOil

Irrigated Rice soil requirement for land evaluation

Description

A dataset containing the soil characteristics of the crop requirements for farming Irrigated Rice.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- pHH2O - pH H2O
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

**RICEIWTemp**  
*Irrigated Rice temp requirement for land evaluation*

**Description**
A dataset containing the temp characteristics of the crop requirements for farming Irrigated Rice.

**Format**
A data frame with 4 rows and 8 columns

**Details**
The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmMaxXm - Average max. temp. warmest month (°C)
- TmAv2 - Mean temp. crop development stage (2nd month) (°C)
- TmMinAv4 - Average absolut Min. temperature of other months (°C)

**See Also**

---

**RICEIWTerrain**  
*Irrigated Rice terrain requirement for land evaluation*

**Description**
A dataset containing the terrain characteristics of the crop requirements for farming Irrigated Rice.

**Format**
A data frame with 4 rows and 8 columns

**Details**
The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)
See Also


---

**RICEIWWater**

<table>
<thead>
<tr>
<th>Irrigated Rice water requirement for land evaluation</th>
</tr>
</thead>
</table>

**Description**

A dataset containing the water characteristics of the crop requirements for farming Irrigated Rice.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WmA1 - Mean precipitation of first month (mm)
- WmA2 - Mean precipitation of second month (mm)
- WmA3 - Mean precipitation of third month (mm)
- WmA4 - Mean precipitation of fourth month (mm)
- WmHA2 - Relative humidity of devel. Stage (%)
- WmHA4 - Relative humidity at harvest stage (%)
- WynN - Mean annual n/N

See Also

Description

A dataset containing the soil characteristics of the crop requirements for farming Rice Cultivation under Natural Floods.

Format

A data frame with 11 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECE (dS/m)
- ESP - ESP (%)
**RICENFTemp**

<table>
<thead>
<tr>
<th>RICENFTemp</th>
<th>Rice Cultivation under Natural Floods temp requirement for land evaluation</th>
</tr>
</thead>
</table>

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Rice Cultivation under Natural Floods.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **TgAv** - Mean temperature of the growing cycle (°C)
- **TmMaxXm** - Average max. temp. warmest month (°C)
- **TmAv2** - Mean temp. crop development stage (2nd month) (°C)
- **TmMinAv4** - Average absolut Min. temperature of other months (°C)

**See Also**


---

**RICENFTerrain**

<table>
<thead>
<tr>
<th>RICENFTerrain</th>
<th>Rice Cultivation under Natural Floods terrain requirement for land evaluation</th>
</tr>
</thead>
</table>

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Rice Cultivation under Natural Floods.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Flood** - Flooding
- **Drainage** - Drainage
**RICENFWater**

**See Also**


---

| RICENFWater | *Rice Cultivation under Natural Floods water requirement for land evaluation* |

**Description**

A dataset containing the water characteristics of the crop requirements for farming *Rice Cultivation under Natural Floods*.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)
- WmhAv2 - Relative humidity of devel. Stage (%)
- WmhAv4 - Relative humidity at harvest stage (%)
- WynN - Mean annual n/N

**See Also**

**RICEURSoil**  
*Rainfed Upland Rice soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Rainfed Upland Rice.

**Format**

A data frame with 8 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **CFragm** - Coarse fragment (Vol.%)
- **SoilDpt** - Soil depth (cm)
- **CECc** - Apparent CEC Clay (cmol (+)/kg clay)
- **BS** - Base Saturation (%)
- **SumBCs** - Sum of basic caions (cmol (+)/kg soil)
- **pHH2O** - pH H2O
- **OC** - Organic carbon (%)
- **SoilTe** - 12 classes of soil texture (Soil Taxonomy)

**See Also**


---

**RICEURTemp**  
*Rainfed Upland Rice temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Rainfed Upland Rice.

**Format**

A data frame with 4 rows and 8 columns
Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmMaxXm - Average max. temp. warmest month (°C)
- TmAv2 - Mean temp. crop development stage (2nd month) (°C)
- TmMinAv4 - Average absolut Min. temperature of other months (°C)

See Also


---

**RICEURTerrain**

Rainfed Upland Rice terrain requirement for land evaluation

---

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Rainfed Upland Rice.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization. )
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)

See Also

**Description**

A dataset containing the water characteristics of the crop requirements for farming Rainfed Upland Rice.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)
- WmhAv2 - Relative humidity of devel. Stage (%)
- WmhAv4 - Relative humidity at harvest stage (%)
- WynN - Mean annual n/N

**See Also**


---

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Rubber.

**Format**

A data frame with 10 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


---

**RUBBERTemp**

*Rubber temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Rubber.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)
- TyMaxAv - Mean annual maximum temperature (°C)
- TdMinXm - Mean daily minimum temperature of coldest month (°C)

See Also

### RUBBERTerrain

**Rubber terrain requirement for land evaluation**

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Rubber.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Flood - Flooding
- Drainage - Drainage
- Slope - nan

**See Also**


### RUBBERWater

**Rubber water requirement for land evaluation**

**Description**

A dataset containing the water characteristics of the crop requirements for farming Rubber.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmER - Months of excessive rain (x)
- WmDryLen - Length dry season (months : P < 1/2 PET)

**See Also**

SAFFLOWERSoil  Safflower soil requirement for land evaluation

Description
A dataset containing the soil characteristics of the crop requirements for farming Safflower.

Format
A data frame with 8 rows and 8 columns

Details
The following are the factors for evaluation:
- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)

See Also

SAFFLOWERTemp  Safflower temp requirement for land evaluation

Description
A dataset containing the temp characteristics of the crop requirements for farming Safflower.

Format
A data frame with 2 rows and 8 columns

Details
The following are the factors for evaluation:
- TmAv1 - Mean temp. of the initial stage (°C)
- TmAv2 - Mean temp. crop development stage (2nd month) (°C)
SAFFLOWERTerrain

See Also


---

**SAFFLOWERTerrain**

Safflower terrain requirement for land evaluation

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Safflower.

**Format**

A data frame with 6 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization. )
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)

See Also


---

**SAFFLOWERWater**

Safflower water requirement for land evaluation

**Description**

A dataset containing the water characteristics of the crop requirements for farming Safflower.

**Format**

A data frame with 6 rows and 8 columns
Details

The following are the factors for evaluation:

- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)
- WmhAv3 - Relative humidity of maturation Stage (%)
- WmhAv4 - Relative humidity at harvest stage (%)

See Also


<table>
<thead>
<tr>
<th>SESAMESoil</th>
<th>Sesame soil requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the soil characteristics of the crop requirements for farming Sesame.

Format

A data frame with 7 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)

See Also

Description

A dataset containing the temp characteristics of the crop requirements for farming Sesame.

Format

A data frame with 3 rows and 8 columns

Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TgMaxAv - Mean max temp. of growing cycle (°C)
- TgMinAv - Mean min. temp. of growing cycle (°C)

See Also


Description

A dataset containing the terrain characteristics of the crop requirements for farming Sesame.

Format

A data frame with 6 rows and 8 columns

Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization. )
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
See Also


---

SESAMEWater

**Sesame water requirement for land evaluation**

**Description**

A dataset containing the water characteristics of the crop requirements for farming Sesame.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WmAv1 - Mean precipitation of first month (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WghAv - Relative humidity growing cycle (%)

See Also


---

SORGHUMSoil

**Sorghum soil requirement for land evaluation**

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Sorghum.

**Format**

A data frame with 12 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol. %)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)  
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC6 - Organic carbon (%) - Kaolinitic materials
- OC7 - Organic carbon (%) - Non Kaolinitic, Non calcareous materials
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also


### Description

A dataset containing the temp characteristics of the crop requirements for farming Sorghum.

### Format

A data frame with 3 rows and 8 columns

### Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TgMaxAv - Mean max temp. of growing cycle (°C)
- TgMinAv - Mean min. temp. of growing cycle (°C)

See Also

### SORGHUMTerrain

**Sorghum terrain requirement for land evaluation**

**Description**
A dataset containing the terrain characteristics of the crop requirements for farming Sorghum.

**Format**
A data frame with 6 rows and 8 columns

**Details**
The following are the factors for evaluation:
- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization.)
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork.)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)

**See Also**

### SORGHUMWater

**Sorghum water requirement for land evaluation**

**Description**
A dataset containing the water characteristics of the crop requirements for farming Sorghum.

**Format**
A data frame with 3 rows and 8 columns

**Details**
The following are the factors for evaluation:
- **WgAv** - Precipitation of growing cycle (mm)
- **WmAv4** - Mean precipitation of fourth month (mm)
- **WghAv** - Relative humidity growing cycle (%)
SOYASoil

See Also


---

SOYASoil | Soya soil requirement for land evaluation

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Soya.

**Format**

A data frame with 11 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)  
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

SOYATemp  
_Soya temp requirement for land evaluation_

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Soya.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **TgAv** - Mean temperature of the growing cycle (°C)
- **TgMinAv** - Mean min. temp. of growing cycle (°C)

**See Also**


SOYATerrain  
_Soya terrain requirement for land evaluation_

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Soya.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization)
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)
- **SlopeD** - Slope (degree, 6 classes)
**See Also**


---

**SOYAWater**

_Soya water requirement for land evaluation_

---

**Description**

A dataset containing the water characteristics of the crop requirements for farming Soya.

**Format**

A data frame with 9 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **WgAv** - Precipitation of growing cycle (mm)
- **WmAv1** - Mean precipitation of first month (mm)
- **WmAv2** - Mean precipitation of second month (mm)
- **WmAv3** - Mean precipitation of third month (mm)
- **WmAv4** - Mean precipitation of fourth month (mm)
- **WmhAv2** - Relative humidity of devel. Stage (%)
- **WmhAv3** - Relative humidity of maturation Stage (%)
- **WmnN2** - n/N develop. Stage (2nd month)
- **WmnN4** - n/N maturation stage (4th month)

**See Also**

Description

A dataset containing the soil characteristics of the crop requirements for farming Sugar Cane.

Format

A data frame with 15 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol. %)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%) 
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (emol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (emol (+)/kg soil)
- pH H2O - pH H2O
- OC6 - Organic carbon (%) - Kaolinitic materials
- OC7 - Organic carbon (%) - Non Kaolinitic, Non calcareous materials
- OC8 - Organic carbon (%) - Calcareous materials
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- OC - Organic carbon (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

**SUGARCANETemp**

*Sugar Cane temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Sugar Cane.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TdAvg0 - Mean day temperature at germination stage (°C)
- TdAvg1 - Mean day temperature for tillage stage (°C)
- TdAvg2 - Mean day temperature for vegetative stage (°C)
- Tcoef - (Tmax-Tmin)/Tmean maturation stage

**See Also**


---

**SUGARCANETerrain**

*Sugar Cane terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Sugar Cane.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)
**SUGARCANewater**

*Sugar Cane water requirement for land evaluation*

---

**Description**

A dataset containing the water characteristics of the crop requirements for farming Sugar Cane.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Wd10** - 10 days of rainfall (mm)
- **SunH** - Sunshine : hours/year
- **WynN** - Mean annual n/N
- **WmhAv3** - Relative humidity of maturation Stage (%)

**See Also**


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**suit**

*Suitability Scores/Class of the Land Units*

---

**Description**

This function calculates the suitability scores and class of the land units.
suit

Usage

suit(
  crop,
  terrain = NULL,
  water = NULL,
  temp = NULL,
  mf = "triangular",
  sow_month = NULL,
  minimum = NULL,
  maximum = "average",
  interval = NULL,
  sigma = NULL
)

Arguments

crop a string for the name of the crop;
terrain a data frame for the terrain characteristics of the input land units;
water a data frame for the water characteristics of the input land units;
temp a data frame for the temperature characteristics of the input land units;
fuzzy model with default assigned to "triangular" fuzzy model. Other fuzzy models included are "trapezoidal" and "gaussian".
sow_month sowing month of the crop. Takes integers from 1 to 12 (inclusive), representing the twelve months of the year. So if sets to 1, the function assumes sowing month to be January.
minimum factor’s minimum value. If NULL (default), minimum is set to 0. But if numeric of length one, say 0.5, then minimum is set to 0.5, for all factors. To set multiple minimums for multiple factors, simply concatenate these into a numeric vector, the length of this vector should be equal to the number of factors in input land units parameters. However, it can also be set to "average", please refer to the online documentation for more, link in the "See Also" section below.
maximum maximum value for factors. To set multiple maximums for multiple factors, simply concatenate these into a numeric vector, the length of this vector should be equal to the number of factors in input land units parameters. However, it can also be set to "average", please refer to the online documentation for more, link in the "See Also" section below.
interval domains for every suitability class (S1, S2, S3). If fixed (NULL), the interval would be 0 to 25% for N (Not Suitable), 25% to 50% for S3 (Marginally Suitable), 50% to 75% for S2 (Moderately Suitable), and 75% to 100% for (Highly Suitable). If "unbias", the package will take into account the shape of the membership function, and provide the appropriate suitability class intervals. However, it can also be customized by specifying the limits of the suitability classes. Please refer to the online documentation for more, link in the "See Also" section below.
sigma If mf = "gaussian", then sigma represents the constant sigma in the Gaussian formula.
suit

Value

A list of outputs of target characteristics, with the following components:

- "terrain" - a list of outputs for terrain characteristics
- "soil" - a list of outputs for soil characteristics
- "water" - a list of outputs for water characteristics
- "temp" - a list of outputs for temperature characteristics

These components are only available when specified as the target characteristics in either of the arguments above, that is, if terrain argument is specified above, then the "terrain" and "soil" components will be available in the output list. This is also true if water and temp are specified in the arguments above.

Each of the components returned above contains a list of outputs as well with the following components:

- "Factors Evaluated" - a character of factors that matched between the input land units factor and the targetted crop requirement factor
- "Suitability Score" - a data frame of suitability scores for each of the matched factors
- "Suitability Class" - a data frame of suitability classes for each of the matched factors
- "Factors' Minimum Values" - a numeric of minimum values used in the membership function for computing the suitability scores
- "Factors' Minimum Values" - a numeric of maximum values used in the membership function for computing the suitability scores
- "Factors' Weights" - a numeric of weights of the factors specified in the input crop requirements
- "Crop Evaluated" - a character of the name of the targetted crop requirement dataset

See Also

https://alstat.github.io/ALUES/

Examples

library(ALUES)

rice_suit <- suit("ricebr", water=MarinduqueWater, temp=MarinduqueTemp, sow_month = 1)
lapply(rice_suit["water"], function(x) head(x)) # access results for water suitability
lapply(rice_suit["temp"], function(x) head(x)) # access results for temperature suitability
rice_suit <- suit("ricebr", terrain=MarinduqueLT)
lapply(rice_suit["terrain"], function(x) head(x))
lapply(rice_suit["soil"], function(x) head(x))
suitability

Suitability Scores/Class of the Land Units

Description

This function calculates the suitability scores and class of the land units.

Usage

suitability(
  x,
  y,
  mf = "triangular",
  sow_month = NULL,
  minimum = NULL,
  maximum = "average",
  interval = NULL,
  sigma = NULL
)

Arguments

x    a data frame consisting the properties of the land units;
y    a data frame consisting the requirements of a given characteristics (terrain, soil, water and temperature) for a given crop (e.g. coconut, cassava, etc.);
mf membership function with default assigned to "triangular" fuzzy model. Other fuzzy models included are "trapezoidal" and "gaussian".
sow_month sowing month of the crop. Takes integers from 1 to 12 (inclusive), representing the twelve months of the year. So if sets to 1, the function assumes sowing month to be January.
minimum factor's minimum value. If NULL (default), minimum is set to 0. But if numeric of length one, say 0.5, then minimum is set to 0.5, for all factors. To set multiple minimums for multiple factors, simply concatenate these into a numeric vector, the length of this vector should be equal to the number of factors in input land units parameters. However, it can also be set to "average", please refer to the online documentation for more, link in the "See Also" section below.
maximum maximum value for factors. To set multiple maximums for multiple factors, simply concatenate these into a numeric vector, the length of this vector should be equal to the number of factors in input land units parameters. However, it can also be set to "average", please refer to the online documentation for more, link in the "See Also" section below.
interval domains for every suitability class (S1, S2, S3). If fixed (NULL), the interval would be 0 to 25% for N (Not Suitable), 25% to 50% for S3 (Marginally Suitable), 50% to 75% for S2 (Moderately Suitable), and 75% to 100% for (Highly
Suitable). If "unbias", the package will take into account the shape of the membership function, and provide the appropriate suitability class intervals. However, it can also be customized by specifying the limits of the suitability classes. Please refer to the online documentation for more, link in the "See Also" section below.

\[ \text{Suitability Class} = \begin{cases} 
\text{Low} & \text{if } \mu(x) \leq \text{Limit Low} \\
\text{Medium} & \text{if } \text{Limit Low} < \mu(x) \leq \text{Limit High} \\
\text{High} & \text{if } \mu(x) > \text{Limit High}
\end{cases} \]

If \( mf = \text{"gaussian"} \), then sigma represents the constant sigma in the Gaussian formula.

**Value**

A list with the following components:

- "Factors Evaluated" - a character of factors that matched between the input land units factor and the targeted crop requirement factor
- "Suitability Score" - a data frame of suitability scores for each of the matched factors
- "Suitability Class" - a data frame of suitability classes for each of the matched factors
- "Factors' Minimum Values" - a numeric of minimum values used in the membership function for computing the suitability scores
- "Factors' Maximum Values" - a numeric of maximum values used in the membership function for computing the suitability scores
- "Factors' Weights" - a numeric of weights of the factors specified in the input crop requirements
- "Crop Evaluated" - a character of the name of the targeted crop requirement dataset

# @seealso https://alstat.github.io/ALUES/

---

**SUNFLOWERSoil**

*Sunflower soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Sunflower.

**Format**

A data frame with 11 rows and 8 columns

**Details**

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)

---
SUNFLOWERTemp

- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)

See Also


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<tr>
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<th>Sunflower temp requirement for land evaluation</th>
</tr>
</thead>
</table>

Description

A dataset containing the temp characteristics of the crop requirements for farming Sunflower.

Format

A data frame with 1 rows and 8 columns

Details

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)

See Also

**SUNFLOWERTerrain**  
Sunflower terrain requirement for land evaluation

**Description**
A dataset containing the terrain characteristics of the crop requirements for farming Sunflower.

**Format**
A data frame with 6 rows and 8 columns

**Details**
The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)

**See Also**

---

**SUNFLOWERWater**  
Sunflower water requirement for land evaluation

**Description**
A dataset containing the water characteristics of the crop requirements for farming Sunflower.

**Format**
A data frame with 6 rows and 8 columns
Details

The following are the factors for evaluation:

- $W_{gAv}$ - Precipitation of growing cycle (mm)
- $W_{mAv1}$ - Mean precipitation of first month (mm)
- $W_{mAv2}$ - Mean precipitation of second month (mm)
- $W_{mAv4}$ - Mean precipitation of fourth month (mm)
- $W_{mAv5}$ - Mean precipitation of fifth month (mm)
- $W_{ghAv}$ - Relative humidity growing cycle (%)

See Also


---

**TEASoil**

*Tea soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Tea.

**Format**

A data frame with 12 rows and 8 columns

**Details**

The following are the factors for evaluation:

- $CFragm$ - Coarse fragment (Vol.%)
- $SoilDpt$ - Soil depth (cm)
- $CaCO3$ - CaCO3 (%)
- $Gyps$ - Gypsum (%)
- $CECc$ - Apparent CEC Clay (cmol (+)/kg clay)
- $BS$ - Base Saturation (%)
- $SumBCs$ - Sum of basic cations (cmol (+)/kg soil)
- $pHH2O$ - pH H2O
- $OC$ - Organic carbon (%)
- $ECedS$ - ECe (dS/m)
- $ESP$ - ESP (%)
- $SoilTe$ - 12 classes of soil texture (Soil Taxonomy)
See Also


---

**TEATemp**

*Tea temp requirement for land evaluation*

---

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Tea.

**Format**

A data frame with 5 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TyAv - Mean annual temperature (°C)
- TmMinAv - Mean min. temp. of warmest month (°C)
- TmMinXm - Average minimum temperature of coldest month (°C)
- TmMaxXm - Average max. temp. warmest month (°C)
- TmAv4Xm - Mean temp. of 4 warmest month (°C)

**See Also**


---

**TEATerrain**

*Tea terrain requirement for land evaluation*

---

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Tea.

**Format**

A data frame with 4 rows and 8 columns
Details

The following are the factors for evaluation:

- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Flood - Flooding
- Drainage - Drainage
- SlopeD - Slope (degree, 6 classes)

See Also


---

**TEAWater**  
*Tea water requirement for land evaluation*

### Description

A dataset containing the water characteristics of the crop requirements for farming Tea.

### Format

A data frame with 4 rows and 8 columns

### Details

The following are the factors for evaluation:

- WyAv - Annual precipitation (mm)
- WmDryLen - Length dry season (months : \( P < 1/2 \) PET)
- WmDryLen - Length dry season (months : \( P < 1/2 \) PET)
- WyhAv - Mean annual rel. humidity (%)
TOBACCOSoil

Tobacco soil requirement for land evaluation

Description

A dataset containing the soil characteristics of the crop requirements for farming Tobacco.

Format

A data frame with 12 rows and 8 columns

Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also

**TOBACCOTemp**

*TOBACCOTemp*  
*Tobacco temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Tobacco.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)

**See Also**


**TOBACCOTerrain**

*TOBACCOTerrain*  
*Tobacco terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Tobacco.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)
- SlopeD - Slope (degree, 6 classes)
See Also


---

**TOBACCOWater**

*Tobacco water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Tobacco.

**Format**

A data frame with 3 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **WgAv** - Precipitation of growing cycle (mm)
- **WynN** - Mean annual n/N
- **WghAv** - Relative humidity growing cycle (%)

See Also


---

**TOMATOSoil**

*Tomato soil requirement for land evaluation*

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Tomato.

**Format**

A data frame with 12 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic cations (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- ECedS - ECe (dS/m)
- ESP - ESP (%)
- SoilTe - 12 classes of soil texture (Soil Taxonomy)

See Also


---

**TOMATOTemp**

**Tomato temp requirement for land evaluation**

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Tomato.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmAv0 - Mean temp. at germination (°C) (1st month)
- TmAv3 - Mean temp. of the flowering stage (°C)
- TdDiff3 - Temp. diff day/night flowering stage (°C)

See Also

**TOMATO Terrain**  
*Tomato terrain requirement for land evaluation*

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Tomato.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of managemnet with full mechanization. )
- **Slope3** - Slope (%) (3. Low level of managemnet animal traction or handwork.)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)
- **SlopeD** - Slope (degree, 6 classes)

**See Also**


---

**TOMATO Water**  
*Tomato water requirement for land evaluation*

**Description**

A dataset containing the water characteristics of the crop requirements for farming Tomato.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **WgAv** - Precipitation of growing cycle (mm)
- **WghAv** - Relative humidity growing cycle (%)
WATERMELONSoil

See Also


Watermelon soil requirement for land evaluation

Description

A dataset containing the soil characteristics of the crop requirements for farming Watermelon.

Format

A data frame with 10 rows and 8 columns

Details

The following are the factors for evaluation:

- **CFragm** - Coarse fragment (Vol.%)
- **SoilDpt** - Soil depth (cm)
- **CECc** - Apparent CEC Clay (cmol (+)/kg clay)
- **BS** - Base Saturation (%) 
- **SumBCs** - Sum of basic caions (cmol (+)/kg soil)
- **pHH2O** - pH H2O
- **OC** - Organic carbon (%)
- **ECedS** - ECe (dS/m)
- **ESP** - ESP (%)
- **SoilTe** - nan

See Also

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Watermelon.

**Format**

A data frame with 1 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **TgAv** - Mean temperature of the growing cycle (°C)

**See Also**


---

**Description**

A dataset containing the terrain characteristics of the crop requirements for farming Watermelon.

**Format**

A data frame with 7 rows and 8 columns

**Details**

The following are the factors for evaluation:

- **Slope1** - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- **Slope2** - Slope (%) (2. High level of management with full mechanization.)
- **Slope3** - Slope (%) (3. Low level of management animal traction or handwork.)
- **Flood** - Flooding
- **Drainage4** - Drainage (Medium and fine textured soils)
- **Drainage5** - Drainage (Coarse textured soils - Sandy families)
- **SlopeD** - Slope (degree, 6 classes)
See Also


---

**Watermelon water requirement for land evaluation**

**Description**

A dataset containing the water characteristics of the crop requirements for farming Watermelon.

**Format**

A data frame with 2 rows and 8 columns

**Details**

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WghAv - Relative humidity growing cycle (%)  

See Also


---

**Wheat soil requirement for land evaluation**

**Description**

A dataset containing the soil characteristics of the crop requirements for farming Wheat.

**Format**

A data frame with 14 rows and 8 columns
Details

The following are the factors for evaluation:

- CFragm - Coarse fragment (Vol.%)
- SoilDpt - Soil depth (cm)
- CaCO3 - CaCO3 (%)
- Gyps - Gypsum (%)
- CECc - Apparent CEC Clay (cmol (+)/kg clay)
- BS - Base Saturation (%)
- SumBCs - Sum of basic caions (cmol (+)/kg soil)
- pHH2O - pH H2O
- OC - Organic carbon (%)
- OC6 - Organic carbon (%) - Kaolinitic materials
- OC7 - Organic carbon (%) - Non Kaolinitic, Non calcareous materials
- OC8 - Organic carbon (%) - Calcareous materials
- ECedS - ECe (dS/m)
- ESP - ESP (%)  

See Also


---

**WHEATTemp**

*Wheat temp requirement for land evaluation*

**Description**

A dataset containing the temp characteristics of the crop requirements for farming Wheat.

**Format**

A data frame with 4 rows and 8 columns

**Details**

The following are the factors for evaluation:

- TgAv - Mean temperature of the growing cycle (°C)
- TmAv2 - Mean temp. crop development stage (2nd month) (°C)
- TmAv3 - Mean temp. of the flowering stage (°C)
- TmAv4 - Mean temp. of the ripening stage (°C)
**WHEATTerrain**

**See Also**


---

### Description

A dataset containing the terrain characteristics of the crop requirements for farming Wheat.

### Format

A data frame with 6 rows and 8 columns

### Details

The following are the factors for evaluation:

- Slope1 - Slope (%) (1. Irrigated agriculture, basin furrow irrigation)
- Slope2 - Slope (%) (2. High level of management with full mechanization.)
- Slope3 - Slope (%) (3. Low level of management animal traction or handwork.)
- Flood - Flooding
- Drainage4 - Drainage (Medium and fine textured soils)
- Drainage5 - Drainage (Coarse textured soils - Sandy families)

---

**WHEATWater**

**See Also**


---

### Description

A dataset containing the water characteristics of the crop requirements for farming Wheat.

### Format

A data frame with 4 rows and 8 columns
Details

The following are the factors for evaluation:

- WgAv - Precipitation of growing cycle (mm)
- WmAv2 - Mean precipitation of second month (mm)
- WmAv3 - Mean precipitation of third month (mm)
- WmAv4 - Mean precipitation of fourth month (mm)

See Also

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