Package ‘rseedcalc’

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Title Estimating the Proportion of Genetically Modified Seeds in Seedlots via Multinomial Group Testing

Version 1.3

Type Package

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Description Estimate the percentage of seeds in a seedlot that contain stacks of genetically modified traits. Estimates are calculated using a multinomial group testing model with maximum likelihood estimation of the parameters.

License GPL-2

Imports stats

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rseedcalc-package

*Estimation of the proportion of genetically modified stacked seeds in seedlots*

**Description**

Estimate the percentage of seeds in a seedlot that contain stacks of genetically modified traits.

**Details**

The main functions for this package are `stack2` and `stack3`.

For a complete list of functions, use `library(help="rseedcalc")`

**Author(s)**

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**stack3**

*Multinomial group testing estimation of stacked genes*

**Description**

Assuming qualitative tests are performed on `n` pools of `m` seeds, use multinomial group testing to estimate the percent of seeds with single genetic traits and the percentage of seeds with stacked genetic traits.

Print method for seedstack object.

**Usage**

```r
stack3(n, m, nA, nB, nC, nAB, nAC, nBC, nABC, existAB = "Yes", existAC = "Yes", existBC = "Yes", existABC = "Yes", fpr = 0, fnr = 0, check = TRUE)
```

```r
stack2Excel(...)  
stack3Excel(...)  
stack2(n, m, nA, nB, nAB, existAB = "Yes", fpr = 0, fnr = 0, check = TRUE)  
```

```r
# S3 method for class 'seedstack'  
print(x, ...)  
```
Arguments

- **n**: the number of pools
- **m**: the number of seeds in each pool
- **nA**: the number of positive pools for event A only
- **nB**: the number of positive pools for event B only
- **nAB**: the number of positive pools for both A and B
- **nC**: the number of positive pools for event C only
- **nAC**: the number of positive pools for both A and C
- **nBC**: the number of positive pools for both B and C
- **nABC**: the number of positive pools for both A and B and C
- **existAB**: do seeds with a stacked event ’AB’ exist?
- **existAC**: do seeds with a stacked event ’AC’ exist?
- **existBC**: do seeds with a stacked event ’BC’ exist?
- **existABC**: do seeds with a stacked event ’ABC’ exist?
- **fpr**: false positive rate (proportion) for detecting GM events
- **fnr**: false negative rate (proportion) for detecting GM events
- **check**: Should simple checks be performed? Defaults to TRUE
- **x**: A data frame to print pretty.

Details

The 'stack2Excel' and 'stack3Excel' functions are simple wrappers that are intended to be called from Excel and should not issue any warnings.

Value

A data frame with the estimated proportion of seeds for each event, the observed and expected number of positive pools, and whether or not each event can exist.

Author(s)

Kevin Wright, Jean-Louis Laffont

Examples

```r
stack2(10, 300, 0, 1, 2)
stack3(20,150, 2,2,2,2,2,2,3, existAB="no", fnr=.02, fpr=.02)
```
valid  #' Ensure probabilities are valid

**Description**

Force calculated probabilities into the range [0,1].

**Usage**

valid(x)

**Arguments**

- x  probability

**Details**

Due to floating-point arithmetic, a number that should represent a probability can be calculated as being less than zero or greater than one. This function returns a value that is a valid probability.
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