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| INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS | | |
| Geneva | | |

Technical working party ON AUTOMATION AND COMPUTER PROGRAMS

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ADDENDUM

Revision of document TGP/8: Part II: Selected Techniques Used in DUS Examination, New Section: Data Processing for the Assessment of Distinctness and for Producing Variety Descriptions

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The Annexes to this document contain a copy of the results on the practical exercises with a data set for a single characteristic (Stem: length from cotyledon scar to top boll) for flax for the years 2002-2012, of France, Germany, Italy, Japan and the United Kingdom.

Annex I France

Annex II Germany

Annex III Italy

Annex IV Japan

Annex V United Kingdom

[Annexes follow]

PRACTICAL EXERCISE OF FRANCE

The practical exercise was to illustrate on a common data set the methods used by different UPOV members to produce variety descriptions from measured, quantitative characteristics. The purpose of the practical exercise was to clarify the methods and so aid the development of common guidance on data processing for the production of variety descriptions.

A common data set on Flax varieties was produced by experts from France for the practical exercise. The data comprised 48668 plant observations on 303 varieties in 10 years on UPOV characteristic 21 (Stem: length from cotyledon scar to top boll). There were 1367 variety-by-year combinations, with not all varieties present every year. When present, there were between 20 and 120 observations on a variety in a year, depending on the variety and year.

The methods used in the United Kingdom (the UK methods) to produce variety descriptions require variety-by- year means comprised of equal numbers of observations. Consequently, the common data set was restricted to observations on the first 20 plants of those varieties and years where 20 or more plants of the variety were observed in the year, and such years included 2012. This reduced common data set comprised 936 variety-by-year combinations for 153 reference varieties and 30 candidates in 10 years from 2002 to 2012, for which the variety-by-year means were calculated on the original scale of the characteristics.

# FR methods

## Simple statistics method applied for different species: Maize, Oilseed rape, Flax… Combined use of example varieties and reference collection

In this method, we combine the use of UPOV example varieties and varieties from the reference collection.

If an authority has no experience on the species, he will only use the UPOV example varieties the first year (for this exercise in 2002). The middle of every class of notes is determined from the example varieties which are grown.

|  |  |  |  |
| --- | --- | --- | --- |
| Note | Mean 2002 | Middle of class | Number of varieties |
| 1 (Banquise) |  | 203.2 | 0 |
| 2 |  | 328.6 | 3 (variety 4, 48 and 122) |
| 3 (Barbara) | 454 = middle note 3 | 454 | 21 |
| 4 | = midle 3 + (midle7-midle3)/4 | 579.4 | 25 |
| 5 (Bilton) |  | 704.8 | 37 |
| 6 |  | 830.1 | 5 |
| 7 (Escalina) | 955.5 | 955.5 | 34 |
| 8 | = midle 7 + (midle9-midle7)/2 | 1035 | 3 |
| 9 (Drakkar) | 1114.5 | 1114.5 | 1 |

The classes limits are calculated by this way: Minimum (note2) = [Mean (note1) + Mean (note2)] / 2.

The next year, 2003, the mean of example varieties is compared to the mean of varieties for each class:

|  |  |  |
| --- | --- | --- |
| Note | Mean of example varieties in 2003 | Mean of reference collection varieties in 2003 |
| 1 |  |  |
| 2 |  | 295  (=Mean of variety 4, 48 and 122 in 2003) |
| 3 | 434.25 | 417.5 |
| 4 |  | 478.8 |
| 5 | 594.5 | 554.5 |
| 6 |  | 673.7 |
| 7 | 802.5 | 797.4 |
| 8 |  | 850.5 |
| 9 | 959 | 959 |

The method allows us to adjust the note every year by taking into account more varieties for the middle classes calculation.

The middle of every class and their upper limit by year are represented in the table below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2002 | 2003 | 2004 | 2005 | 2006 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Middle 1 | 203.2 | 172.5 | 205.2 | 237.0 | 323.4 | 376.5 | 324.1 | 358 | 264.5 | 366.3 |
| Max 1 | 265.9 | 233.8 | 260.5 | 273.0 | 362.5 | 382.2 | 372.8 | 378.1 | 288.9 | 371.6 |
| Middle 2 | 328.6 | 295 | 315.8 | 309.0 | 401.6 | 387.9 | 421.4 | 398.1 | 313.2 | 376.9 |
| Max 2 | 391.3 | 356.3 | 374.4 | 345.0 | 440.7 | 393.4 | 452.6 | 424.8 | 322.6 | 391.2 |
| Middle 3 | 454.0 | 417.5 | 432.9 | 381 | 479.8 | 398.8 | 483.7 | 451.4 | 332 | 405.5 |
| Max 3 | 516.7 | 448.2 | 438.2 | 397.3 | 498.1 | 410.6 | 498.5 | 474.8 | 338.4 | 417.1 |
| Middle 4 | 579.4 | 478.8 | 443.4 | 413.5 | 516.4 | 422.3 | 513.3 | 498.1 | 344.7 | 428.6 |
| Max 4 | 642.1 | 516.7 | 485.1 | 437.0 | 553.1 | 431.9 | 531.1 | 513.7 | 350.5 | 441.6 |
| Middle 5 | 704.8 | 554.5 | 526.7 | 460.4 | 589.8 | 441.5 | 548.9 | 529.3 | 356.3 | 454.6 |
| Max 5 | 767.4 | 614.1 | 576.1 | 539.5 | 664.8 | 506.9 | 636.4 | 619.6 | 422.0 | 534.7 |
| Middle 6 | 830.1 | 673.7 | 625.5 | 618.5 | 739.7 | 572.2 | 723.9 | 709.8 | 487.6 | 614.7 |
| Max 6 | 892.8 | 735.6 | 686.0 | 644.2 | 765.8 | 593.7 | 747.7 | 733.4 | 496.5 | 634.6 |
| Middle 7 | 955.5 | 797.4 | 746.5 | 669.8 | 791.9 | 615.1 | 771.4 | 757 | 505.4 | 654.4 |
| Max 7 | 995.3 | 824.0 | 772.7 | 699.9 | 805.2 | 626.2 | 788.2 | 767.8 | 515.0 | 665.2 |
| Middle 8 | 1035.0 | 850.5 | 798.9 | 730 | 818.4 | 637.3 | 805 | 778.5 | 524.5 | 676 |
| Max 8 | 1074.8 | 904.8 | 872.1 | 796.5 | 862.7 | 653.1 | 827.6 | 781.9 | 532.5 | 696.0 |
| Middle 9 | 1114.5 | 959 | 945.3 | 863 | 907 | 668.9 | 850.2 | 785.3 | 540.5 | 716 |

To establish the description of the candidate, the transformations of the two years of study are taken into account.

This method is very reliable but it also needs expertise, mainly concerning limits of classes. Indeed it is very important to be careful to the distribution of the varieties. We have especially to check the number of varieties in the extreme classes in order to avoid a drift and we check the normal distribution of varieties.

NB: we can note 2 distributions of the varieties, for example in 2003:

These 2 distributions match the 2 kind of varieties: linseed (which is smaller) and flax (group of varieties which are taller).

## Linear regression method applied mainly on forage crops

The principle to establish the description of varieties is based on a linear regression from the adjusted means of 2 or 3 cycles provided by the COY program.

A graph is created with, for abscissa the adjusted means of the example varieties and for ordinate the notes of these varieties.

Then the candidate varieties are reported on the regression, using their adjusted means.

This method is applied to candidate varieties after 2 or 3 growing cycles. We consider that adjusted means is not reliable enough after just one growing cycle. If there is an high interaction between the candidate variety and its environment, we think that one growing cycle is not enough to establish its description. For this exercise, we have taken into account candidate varieties for which there were data for 2011 and 2012.

This method needs a good set of reliable example varieties. In this case, the example varieties are not good enough:

|  |  |  |  |
| --- | --- | --- | --- |
| **Example varieties** | **Adjusted means** | **Adjusted note according to the regression** | **Rounded note** |
| 1 | 273.13 | 1.56208 | 2 |
| 3 | 351.9 | 3.04932 | 3 |
| 5 | 401.55 | 3.98675 | 4 |
| 7 | 580.88 | 7.37263 | 7 |
| 9 | 668.62 | 9.02923 | 9 |

In this dataset, example varieties of note 3 and 5 are too close; their real note according to the regression is 3.05 and 3.99.

This method is very powerful though with a reliable set of example varieties. Each year the set of our example varieties is checked and optimized.

To conclude, according to the French methods, the candidate notes are:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variety | Mean 2011 | Note 2011 | Mean 2012 | Note 2012 | **Note method 1** | Adjusted means | **Note method 2** |
| Variety 287 |  |  | 350.7 | 1 |  |  |  |
| Variety 284 |  |  | 366.1 | 1 |  |  |  |
| Variety 283 |  |  | 370.1 | 1 |  |  |  |
| Variety 262 | 207.4 | 1 | 316.4 | 1 | **1** | 262.76 | **1** |
| Variety 263 | 225.5 | 1 | 382.1 | 2 | **2** | 306.51 | **2** |
| Variety 288 |  |  | 435.5 | 4 | **4** | 380.25 | **4** |
| Variety 269 | 330.1 | 3 | 480.7 | 5 | **4** | 396.75 | **4** |
| Variety 275 | 329.2 | 3 | 458.2 | 5 | **4** | 402.94 | **4** |
| Variety 289 |  |  | 455 | 5 | **5** |  |  |
| Variety 290 |  |  | 453.6 | 5 | **5** |  |  |
| Variety 277 | 381.2 | 5 | 485.7 | 5 | **5** | 430.73 | **5** |
| Variety 274 | 405.7 | 5 | 486.3 | 5 | **5** | 445.53 | **5** |
| Variety 302 |  |  | 453.5 | 5 | **5** |  |  |
| Variety 303 |  |  | 455.7 | 5 | **5** |  |  |
| Variety 297 |  |  | 463.1 | 5 | **5** |  |  |
| Variety 228 | 479.4 | 6 | 594.4 | 6 | **6** | 530.08 | **6** |
| Variety 293 |  |  | 630.5 | 6 | **6** |  |  |
| Variety 270 | 551.3 | 9 | 615.2 | 6 | **7** | 573.17 | **7** |
| Variety 267 | 522.4 | 8 | 646.8 | 7 | **7** | 588.16 | **8** |
| Variety 268 | 549.2 | 9 | 647.4 | 7 | **7** | 602.42 | **8** |
| Variety 300 |  |  | 649.2 | 7 | **7** |  |  |
| Variety 295 |  |  | 658.1 | 7 | **7** |  |  |
| Variety 299 |  |  | 661.2 | 7 | **7** |  |  |
| Variety 291 |  |  | 661.3 | 7 | **7** |  |  |
| Variety 272 | 522.5 | 8 | 666.8 | 8 | **8** | 611.4 | **8** |
| Variety 273 | 548.3 | 9 | 692.4 | 8 | **8** | 615.59 | **8** |
| Variety 294 |  |  | 680.8 | 8 | **8** |  |  |
| Variety 292 |  |  | 683.4 | 8 | **8** |  |  |
| Variety 298 |  |  | 733.1 | 9 | **9** |  |  |
| Variety 301 |  |  | 749.3 | 9 | **9** |  |  |
| Variety 296 |  |  | 764.8 | 9 | **9** |  |  |

[Annex II follows]

PRACTICAL EXERCISE OF GERMANY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variety** | Example variety | Mean 2011 | Note 2011 | Mean 2012 | Note 2012 |
| **1** |  | 568.58 | 8 | 635.48 | 7 |
| **12** |  | 475.18 | 6 | 621.60 | 7 |
| **14** |  | 253.90 | 2 | 353.05 | 2 |
| **17** |  |  |  | 481.18 | 4 |
| **20** |  |  |  | 675.60 | 7 |
| **21** |  | 465.13 | 6 | 725.20 | 8 |
| **24** | Barbara (3) | 280.08 | 2 | 420.28 | 3 |
| **26** |  |  |  | 458.59 | 4 |
| **28** |  | 497.80 | 7 | 727.68 | 8 |
| **30** |  | 267.03 | 2 | 341.15 | 2 |
| **33** |  | 351.10 | 4 | 452.75 | 4 |
| **35** | Escalina (7) | 506.70 | 7 | 654.08 | 7 |
| **36** |  | 506.75 | 7 | 626.58 | 7 |
| **38** |  | 522.23 | 7 | 695.88 | 8 |
| **39** |  | 495.65 | 6 | 653.38 | 7 |
| **40** |  | 317.20 | 3 | 421.30 | 3 |
| **42** |  |  |  | 548.00 | 5 |
| **44** |  | 306.78 | 3 | 443.83 | 3 |
| **45** |  | 301.75 | 3 | 430.05 | 3 |
| **48** |  | 259.63 | 2 |  |  |
| **49** |  | 498.23 | 7 | 624.65 | 7 |
| **52** |  |  |  | 667.35 | 7 |
| **56** |  | 343.80 | 4 | 354.60 | 2 |
| **61** |  | 305.85 | 3 | 380.48 | 2 |
| **63** |  | 405.33 | 5 | 418.50 | 3 |
| **70** |  | 391.23 | 4 | 532.05 | 5 |
| **71** |  | 479.65 | 6 | 668.93 | 7 |
| **73** |  | 306.63 | 3 | 444.65 | 3 |
| **76** |  | 286.75 | 2 | 408.88 | 3 |
| **77** |  | 473.60 | 6 | 601.18 | 6 |
| **78** |  | 302.55 | 3 | 462.63 | 4 |
| **79** |  | 304.53 | 3 | 325.73 | 1 |
| **80** |  | 355.93 | 4 | 435.55 | 3 |
| **81** |  | 242.78 | 2 |  |  |
| **82** |  | 240.13 | 2 | 317.15 | 1 |
| **83** |  | 267.75 | 2 | 361.80 | 2 |
| **84** |  | 342.78 | 4 | 423.08 | 3 |
| **85** |  | 270.23 | 2 | 431.90 | 3 |
| **87** |  | 325.20 | 3 | 429.13 | 3 |
| **88** |  | 326.75 | 3 | 401.83 | 3 |
| **90** |  | 367.63 | 4 | 473.68 | 4 |
| **96** |  | 529.95 | 7 | 710.94 | 8 |
| **97** | Dakkar (9) | 605.80 | 9 | 733.25 | 8 |
| **98** |  | 553.81 | 8 | 668.89 | 7 |
| **99** |  | 469.78 | 6 | 673.98 | 7 |
| **Variety** | Example variety | Mean 2011 | Note 2011 | Mean 2012 | Note 2012 |
| **102** |  | 550.10 | 8 | 674.18 | 7 |
| **103** |  | 287.03 | 2 | 394.43 | 3 |
| **108** |  | 369.15 | 4 |  |  |
| **109** |  | 403.78 | 5 | 518.83 | 5 |
| **110** |  | 336.40 | 3 |  |  |
| **113** |  | 324.85 | 3 | 454.60 | 4 |
| **114** |  | 346.98 | 4 | 430.65 | 3 |
| **115** |  | 344.25 | 4 | 427.55 | 3 |
| **121** |  | 327.40 | 3 | 489.85 | 4 |
| **124** |  | 251.48 | 2 | 426.95 | 3 |
| **126** |  | 258.23 | 2 |  |  |
| **128** |  | 230.65 | 1 | 352.33 | 2 |
| **130** |  | 503.08 | 7 | 610.23 | 6 |
| **131** |  | 343.38 | 4 | 452.18 | 4 |
| **132** |  | 321.58 | 3 | 435.50 | 3 |
| **136** |  | 345.63 | 4 | 417.60 | 3 |
| **137** |  | 320.83 | 3 |  |  |
| **140** |  | 511.15 | 7 | 682.33 | 8 |
| **142** |  | 518.43 | 7 | 700.93 | 8 |
| **143** |  | 383.83 | 4 | 494.85 | 4 |
| **144** |  |  |  | 390.00 | 3 |
| **146** | Bilton (5) | 355.83 | 4 | 448.38 | 4 |
| **147** |  | 335.55 | 3 | 442.50 | 3 |
| **148** |  | 472.04 | 6 | 657.93 | 7 |
| **149** |  | 320.26 | 3 | 337.28 | 2 |
| **150** |  | 514.18 | 7 | 665.78 | 7 |
| **151** |  | 302.04 | 3 | 419.56 | 3 |
| **152** |  | 319.20 | 3 | 413.30 | 3 |
| **153** |  | 339.75 | 3 | 375.68 | 2 |
| **154** |  |  |  | 435.08 | 3 |
| **156** |  | 429.95 | 5 | 625.23 | 7 |
| **157** |  | 410.65 | 5 | 616.40 | 6 |
| **158** |  | 528.55 | 7 | 619.15 | 6 |
| **159** |  | 389.03 | 4 | 504.73 | 5 |
| **160** |  | 282.98 | 2 | 384.03 | 2 |
| **162** |  | 524.25 | 7 |  |  |
| **163** |  | 329.23 | 3 | 434.38 | 3 |
| **164** |  | 419.40 | 5 | 488.05 | 4 |
| **165** |  | 541.78 | 7 | 659.38 | 7 |
| **166** |  | 301.08 | 3 | 366.00 | 2 |
| **167** |  |  |  | 502.70 | 4 |
| **168** | Banquise (1) | 247.58 | 2 | 301.25 | 1 |
| **169** |  | 225.15 | 1 | 316.58 | 1 |
| **170** |  | 540.90 | 7 | 675.70 | 7 |
| **172** |  | 371.80 | 4 | 417.85 | 3 |
| **173** |  | 294.96 | 3 | 367.69 | 2 |
| **Variety** | Example variety | Mean 2011 | Note 2011 | Mean 2012 | Note 2012 |
| **174** |  | 353.45 | 4 | 389.68 | 3 |
| **175** |  | 520.23 | 7 | 687.88 | 8 |
| **177** |  | 318.63 | 3 | 434.73 | 3 |
| **178** |  | 248.10 | 2 | 373.38 | 2 |
| **179** |  | 330.55 | 3 | 539.25 | 5 |
| **180** |  | 528.33 | 7 | 698.53 | 8 |
| **181** |  | 575.48 | 8 | 682.35 | 8 |
| **182** |  | 297.73 | 3 | 334.00 | 2 |
| **183** |  | 356.68 | 4 | 421.10 | 3 |
| **184** |  | 252.18 | 2 | 353.10 | 2 |
| **185** |  | 528.85 | 7 | 653.63 | 7 |
| **188** |  | 479.18 | 6 | 616.68 | 6 |
| **189** |  | 339.20 | 3 | 469.25 | 4 |
| **190** |  | 379.10 | 4 | 513.78 | 5 |
| **194** |  | 266.90 | 2 |  |  |
| **195** |  | 344.40 | 4 | 369.63 | 2 |
| **196** |  | 317.55 | 3 | 430.13 | 3 |
| **197** |  | 227.60 | 1 | 372.55 | 2 |
| **200** |  | 402.04 | 5 | 570.78 | 6 |
| **201** |  | 263.93 | 2 | 373.03 | 2 |
| **202** |  | 220.68 | 1 | 374.75 | 2 |
| **203** |  | 276.68 | 2 | 385.20 | 2 |
| **204** |  | 302.69 | 3 | 468.60 | 4 |
| **205** |  | 496.10 | 7 | 682.48 | 8 |
| **206** |  | 550.85 | 8 | 620.60 | 7 |
| **207** |  | 515.03 | 7 | 627.75 | 7 |
| **208** |  | 438.35 | 5 | 596.03 | 6 |
| **209** |  | 521.33 | 7 | 679.58 | 8 |
| **210** |  | 568.00 | 8 | 645.98 | 7 |
| **211** |  | 533.93 | 7 | 621.15 | 7 |
| **212** |  | 392.60 | 4 | 398.48 | 3 |
| **213** |  | 362.93 | 4 | 471.13 | 4 |
| **214** |  | 378.30 | 4 | 459.28 | 4 |
| **215** |  | 560.85 | 8 | 674.08 | 7 |
| **216** |  | 562.73 | 8 | 682.45 | 8 |
| **217** |  | 507.78 | 7 | 677.20 | 7 |
| **219** |  | 260.75 | 2 | 397.25 | 3 |
| **221** |  | 561.28 | 8 | 739.98 | 9 |
| **222** |  | 596.90 | 8 | 725.13 | 8 |
| **224** |  | 314.03 | 3 | 374.28 | 2 |
| **225** |  |  |  | 656.48 | 7 |
| **226** |  | 340.40 | 3 | 374.25 | 2 |
| **227** |  | 495.43 | 6 | 604.78 | 6 |
| **228** |  | 479.35 | 6 | 594.40 | 6 |
| **229** |  | 503.64 | 7 | 601.23 | 6 |
| **230** |  | 385.21 | 4 | 415.43 | 3 |
| **231** |  | 357.69 | 4 | 396.68 | 3 |
| **Variety** | Example variety | Mean 2011 | Note 2011 | Mean 2012 | Note 2012 |
| **232** |  | 401.28 | 5 |  |  |
| **233** |  | 284.10 | 2 |  |  |
| **235** |  | 503.15 | 7 |  |  |
| **237** |  | 478.53 | 6 | 644.73 | 7 |
| **238** |  | 300.69 | 3 | 438.50 | 3 |
| **239** |  | 353.19 | 4 | 408.90 | 3 |
| **241** |  | 529.38 | 7 | 669.70 | 7 |
| **243** |  | 286.35 | 2 | 416.60 | 3 |
| **244** |  | 489.95 | 6 | 616.13 | 6 |
| **247** |  |  |  | 375.65 | 2 |
| **248** |  | 347.95 | 4 | 433.85 | 3 |
| **249** |  | 393.98 | 5 | 412.23 | 3 |
| **250** |  |  |  | 426.28 | 3 |
| **251** |  | 346.10 | 4 | 383.35 | 2 |
| **252** |  | 392.93 | 5 | 472.28 | 4 |
| **253** |  | 487.03 | 6 | 663.13 | 7 |
| **256** |  | 610.30 | 9 |  |  |
| **257** |  | 604.88 | 9 | 709.85 | 8 |
| **258** |  | 548.28 | 8 | 620.98 | 7 |
| **259** |  | 621.03 | 9 |  |  |
| **260** |  | 581.58 | 8 | 660.03 | 7 |
| **261** |  | 625.33 | 9 |  |  |
| **262** |  | 211.74 | 1 | 316.43 | 1 |
| **263** |  | 223.08 | 1 | 373.41 | 2 |
| **264** |  | 269.54 | 2 |  |  |
| **265** |  | 240.98 | 2 |  |  |
| **266** |  | 311.30 | 3 |  |  |
| **267** |  | 522.44 | 7 | 646.80 | 7 |
| **268** |  | 549.23 | 8 | 647.39 | 7 |
| **269** |  | 330.05 | 3 | 480.69 | 4 |
| **270** |  | 551.31 | 8 | 615.20 | 6 |
| **271** |  | 578.55 | 8 |  |  |
| **272** |  | 522.50 | 7 | 666.78 | 7 |
| **273** |  | 548.34 | 8 | 692.41 | 8 |
| **274** |  | 405.73 | 5 | 486.28 | 4 |
| **275** |  | 329.23 | 3 | 458.23 | 4 |
| **276** |  | 352.63 | 4 |  |  |
| **277** |  | 381.20 | 4 | 485.69 | 4 |
| **278** |  | 362.75 | 4 | 438.00 | 3 |
| **279** |  | 382.10 | 4 | 525.43 | 5 |
| **280** |  | 277.18 | 2 | 423.20 | 3 |
| **281** |  | 286.78 | 2 | 402.00 | 3 |
| **282** |  | 527.88 | 7 | 647.93 | 7 |
| **283** |  |  |  | 370.09 | 2 |
| **284** |  |  |  | 366.11 | 2 |
| **285** |  |  |  | 434.20 | 3 |
| **286** |  |  |  | 351.28 | 2 |
| **Variety** | Example variety | Mean 2011 | Note 2011 | Mean 2012 | Note 2012 |
| **287** |  |  |  | 350.73 | 2 |
| **288** |  |  |  | 435.50 | 3 |
| **289** |  |  |  | 455.00 | 4 |
| **290** |  |  |  | 453.55 | 4 |
| **291** |  |  |  | 661.29 | 7 |
| **292** |  |  |  | 683.41 | 8 |
| **293** |  |  |  | 630.48 | 7 |
| **294** |  |  |  | 680.83 | 8 |
| **295** |  |  |  | 658.05 | 7 |
| **296** |  |  |  | 764.80 | 9 |
| **297** |  |  |  | 463.13 | 4 |
| **298** |  |  |  | 733.06 | 8 |
| **299** |  |  |  | 661.21 | 7 |
| **300** |  |  |  | 649.19 | 7 |
| **301** |  |  |  | 749.34 | 9 |
| **302** |  |  |  | 453.54 | 4 |
| **303** |  |  |  | 455.70 | 4 |

Characteristic: Stem: length from cotyledon scar to top boll

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flax |  | | | | | | | | | | |
| [Variety[1]](file:///D:\\Users\\koide\\AppData\\Local\\Microsoft\\Windows\\Temporary%20Internet%20Files\\Content.Outlook\\A6NU3T7E\\practical%20exercise.xlsx" \l "RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 14 | 470 | 350 | 347 | 339 | 397 | 368 | 338 | 338 | 272 | 333 | 355 |
| 169 |  |  |  |  | 488 | 324 | 384 | 387 | 240 | 301 | 383 |
| 168 |  |  |  |  | 516 | 293 | 422 | 357 | 290 | 288 | 390 |
| 45 | 470 | 390 | 375 | 354 | 458 |  | 427 | 362 | 318 | 403 | 391 |
| 184 |  |  |  |  |  | 351 | 407 | 342 | 276 | 339 | 392 |
| 83 | 545 | 402 | 403 | 350 | 472 | 342 | 444 | 397 | 303 | 309 | 397 |
| 128 | 548 | 415 | 418 | 338 | 516 | 328 | 449 | 372 | 274 | 334 | 399 |
| 44 | 443 |  | 454 |  | 422 |  |  |  | 288 | 422 | 399 |
| 166 |  |  |  | 380 | 465 | 330 | 465 | 263 | 356 | 352 | 405 |
| 173 |  |  |  |  | 485 | 422 | 423 | 325 | 264 | 349 | 407 |
| 202 |  |  |  |  |  |  | 447 | 351 | 245 | 382 | 408 |
| 40 | 476 | 397 | 424 | 381 | 449 | 419 | 385 | 395 | 350 | 406 | 408 |
| 124 | 462 |  |  |  |  | 484 | 362 | 383 | 273 | 412 | 410 |
| 160 |  |  |  | 352 | 439 | 375 | 391 | 408 | 345 | 354 | 412 |
| **79** | **534** | **391** | **399** | **379** | **483** | **448** | **437** | **385** | **356** | **312** | **412** |
| 286 |  |  |  |  |  |  |  |  |  | 358 | 414 |
| 178 |  |  |  |  |  | 383 | 429 | 368 | 277 | 379 | 416 |
| 203 |  |  |  |  |  |  | 415 | 367 | 295 | 385 | 417 |
| 182 |  |  |  |  |  | 446 | 375 | 375 | 317 | 329 | 417 |
| 24 | 461 | 426 | 469 | 416 | 439 | 439 | 452 | 347 | 321 | 425 | 419 |
| 149 |  |  | 387 |  | 435 | 429 | 455 | 364 | 384 | 335 | 421 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise.xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
| 82 | 636 | 444 | 459 | 400 | 558 | 343 | 451 | 368 | 263 | 309 | 423 |
| 197 |  |  |  |  |  |  | 429 | 487 | 233 | 354 | 427 |
| 219 |  |  |  |  |  |  | 430 | 365 | 310 | 402 | 428 |
| 144 |  | 455 | 439 |  |  |  | 443 |  |  | 407 | 429 |
| 247 |  |  |  |  |  |  |  | 413 |  | 378 | 430 |
| 30 | 632 | 441 | 427 | 384 | 518 | 360 | 424 | 461 | 299 | 360 | 430 |
| 103 | 574 | 460 |  |  |  |  |  |  | 286 | 408 | 434 |
| 73 | 500 |  |  |  |  |  |  | 407 | 339 | 424 | 435 |
| 281 |  |  |  |  |  |  |  |  | 270 | 388 | 437 |
| 224 |  |  |  |  |  |  | 414 | 445 | 307 | 377 | 437 |
| 151 |  |  | 494 | 420 | 481 | 348 | 431 | 404 | 315 | 415 | 439 |
| 195 |  |  |  |  |  | 407 | 439 | 414 | 356 | 336 | 439 |
| 26 | 519 |  |  |  |  |  |  |  |  | 467 | 440 |
| 85 | 541 | 457 | 458 | 403 | 502 | 439 | 449 | 388 | 356 | 416 | 441 |
| 56 |  |  |  |  |  |  |  |  | 344 | 328 | 443 |
| 152 |  |  | 411 | 363 | 562 | 430 | 496 | 349 | 355 | 384 | 445 |
| 88 | 515 |  |  |  |  |  |  |  | 344 | 420 | 445 |
| 226 |  |  |  |  |  |  |  | 399 | 340 | 366 | 445 |
| 250 |  |  |  |  |  |  |  | 428 |  | 404 | 451 |
| 154 |  |  | 411 | 405 |  | 408 | 469 | 486 |  | 426 | 454 |
| 280 |  |  |  |  |  |  |  |  | 285 | 413 | 457 |
| 201 |  |  |  |  |  |  | 456 | 519 | 287 | 362 | 457 |
| 87 | 564 | 445 | 443 | 438 | 542 | 449 | 522 | 462 | 340 | 435 | 464 |
| 196 |  |  |  |  |  |  | 483 | 436 | 347 | 394 | 466 |
| 248 |  |  |  |  |  |  |  | 404 | 359 | 417 | 469 |
| **76** | **615** |  |  |  |  | **491** | **426** | **461** | **317** | **420** | **469** |
| 251 |  |  |  |  |  |  |  | 457 | 359 | 364 | 469 |
| 183 |  |  |  |  |  | 462 | 441 | 368 | 412 | 418 | 469 |
| 177 |  |  |  |  |  |  |  |  | 318 | 407 | 470 |
| 80 | 589 |  |  |  |  |  |  |  | 341 | 436 | 473 |
| 174 |  |  |  |  | 527 | 484 | 473 | 455 | 360 | 372 | 474 |
| 231 |  |  |  |  |  |  |  | 425 | 393 | 380 | 475 |
| 153 |  |  | 433 | 424 | 565 | 480 | 515 | 471 | 354 | 361 | 476 |
| 239 |  |  |  |  |  |  |  | 434 | 358 | 411 | 477 |
| 212 |  |  |  |  |  |  | 441 | 474 | 411 | 382 | 478 |
| 84 | 610 | 534 | 486 | 443 | 539 | 492 | 491 | 423 | 397 | 397 | 481 |
| 238 |  |  |  |  |  |  |  | 465 | 318 | 440 | 484 |
| 113 | 649 |  |  | 434 |  |  |  |  | 318 | 435 | 484 |
| 163 |  |  |  | 414 | 574 | 488 | 469 | 453 | 352 | 421 | 485 |
| 243 |  |  |  |  |  |  |  | 516 | 304 | 409 | 485 |
| 230 |  |  |  |  |  |  |  | 399 | 430 | 405 | 488 |
| 249 |  |  |  |  |  |  |  | 479 | 388 | 392 | 496 |
| 136 | 604 | 537 | 522 | 436 | 570 | 496 | 540 | 498 | 362 | 396 | 496 |
| 61 | 713 |  |  | 437 |  | 523 | 491 | 497 | 338 | 350 | 497 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise.xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
| 78 | 653 | 575 | 547 | 408 | 555 |  |  |  | 314 | 460 | 497 |
| 115 | 721 | 525 | 496 | 438 | 607 | 409 | 526 | 514 | 344 | 410 | 499 |
| 278 |  |  |  |  |  |  |  |  | 345 | 438 | 499 |
| 131 | 654 | 515 | 496 | 455 | 622 | 476 | 528 | 512 | 344 | 450 | 505 |
| 204 |  |  |  |  |  |  | 553 | 496 | 338 | 441 | 508 |
| 17 | 652 | 575 | 557 | 455 | 541 |  |  |  |  | 461 | 508 |
| 285 |  |  |  |  |  |  |  |  |  | 454 | 510 |
| 109 | 621 | 556 | 482 |  |  |  | 511 | 457 | 464 | 498 | 510 |
| 63 | 597 | 549 | 507 | 468 | 585 | 526 | 565 | 494 | 429 | 400 | 512 |
| 189 |  |  |  |  |  | 496 | 558 | 476 | 324 | 466 | 513 |
| **146** |  | **595** | **564** | **449** | **625** | **360** | **543** | **526** | **381** | **423** | **514** |
| 252 |  |  |  |  |  |  |  | 489 | 379 | 447 | 514 |
| 172 |  |  |  |  | 553 | 487 | 539 | 553 | 385 | 407 | 516 |
| 114 | 737 |  |  |  |  | 542 | 482 | 468 | 386 | 415 | 519 |
| 213 |  |  |  |  |  |  | 557 | 468 | 399 | 459 | 522 |
| 143 |  | 544 | 586 | 469 | 620 | 376 | 563 | 519 | 402 | 479 | 524 |
| 121 | 663 |  |  |  |  |  |  |  | 363 | 494 | 525 |
| 132 | 728 | 540 | 524 | 465 | 640 | 517 | 549 | 533 | 346 | 406 | 525 |
| 179 |  |  |  |  |  | 462 | 646 | 484 | 259 | 540 | 527 |
| 147 |  | 578 | 533 | 487 | 620 | 522 | 508 | 553 | 382 | 405 | 528 |
| 214 |  |  |  |  |  |  | 569 | 519 | 386 | 434 | 528 |
| 159 |  |  |  | 436 | 580 |  |  |  | 399 | 535 | 535 |
| 90 | 764 | 564 | 495 | 460 | 640 | 528 | 554 | 579 | 393 | 456 | 543 |
| 167 |  |  |  | 493 | 621 |  |  |  |  | 491 | 546 |
| 33 | 737 | 612 | 549 | 461 | 654 | 626 | 581 | 479 | 376 | 423 | 550 |
| 190 |  |  |  |  |  | 507 | 552 | 558 | 416 | 488 | 553 |
| **164** |  |  |  | **491** | **611** | **475** | **572** | **571** | **449** | **492** | **555** |
| 70 | 752 |  |  |  |  |  |  | 506 | 365 | 540 | 557 |
| 279 |  |  |  |  |  |  |  |  | 389 | 537 | 570 |
| 42 | 712 | 748 | 612 | 590 | 709 | 565 | 699 | 560 |  | 572 | 623 |
| 200 |  |  |  |  |  |  | 685 | 623 | 410 | 604 | 632 |
| 229 |  |  |  |  |  |  |  | 601 | 471 | 645 | 648 |
| 208 |  |  |  |  |  |  | 726 | 719 | 378 | 605 | 658 |
| **77** | **875** |  | **697** | **611** | **795** | **580** | **714** | **675** | **399** | **626** | **669** |
| 227 |  |  |  |  |  |  |  | 702 | 472 | 639 | 681 |
| 157 |  |  | 712 | 683 | 725 | 665 | 733 | 691 | 415 | 616 | 681 |
| 282 |  |  |  |  |  |  |  |  | 475 | 672 | 681 |
| 49 | 874 | 769 | 712 | 630 | 746 | 558 | 739 | 661 | 493 | 634 | 682 |
| 188 |  |  |  |  |  | 646 | 719 | 675 | 485 | 649 | 684 |
| 156 |  |  | 714 | 684 | 766 | 692 | 749 | 712 | 391 | 638 | 694 |
| 244 |  |  |  |  |  |  |  | 699 | 527 | 629 | 694 |
| 253 |  |  |  |  |  |  |  | 729 | 486 | 663 | 702 |
| **36** | **926** | **783** | **726** | **643** | **775** | **621** | **743** | **662** | **518** | **633** | **703** |
| 130 | 902 | 770 | 723 | 675 | 782 | 660 | 779 | 665 | 509 | 639 | 710 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise.xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
| 185 |  |  |  |  |  | 621 | 752 | 752 | 491 | 695 | 711 |
| 241 |  |  |  |  |  |  |  | 692 | 503 | 725 | 716 |
| 206 |  |  |  |  |  |  | 712 | 714 | 629 | 626 | 722 |
| 150 |  |  | 733 | 682 | 824 | 668 | 781 | 729 | 471 | 680 | 722 |
| 209 |  |  |  |  |  |  | 727 | 771 | 518 | 667 | 722 |
| 258 |  |  |  |  |  |  |  |  | 578 | 651 | 722 |
| 217 |  |  |  |  |  |  | 709 | 733 | 532 | 713 | 723 |
| 142 |  | 811 | 769 | 666 | 804 | 641 | 715 | 750 | 481 | 714 | 723 |
| 211 |  |  |  |  |  |  | 763 | 743 | 567 | 624 | 726 |
| 158 |  |  | 774 | 694 | 771 | 662 | 750 | 805 | 533 | 629 | 728 |
| 99 | 955 | 814 | 760 | 647 | 791 | 664 | 746 | 714 | 476 | 719 | 728 |
| 237 |  |  |  |  |  |  |  | 754 | 520 | 690 | 731 |
| 12 | 916 | 827 | 736 | 659 | 788 | 722 | 750 | 729 | 531 | 662 | 732 |
| 210 |  |  |  |  |  |  | 737 | 765 | 595 | 628 | 732 |
| 207 |  |  |  |  |  |  | 804 | 730 | 555 | 638 | 733 |
| 268 |  |  |  |  |  |  |  |  | 590 | 662 | 733 |
| 225 |  |  |  |  |  |  | 701 | 737 |  | 721 | 735 |
| 165 |  |  |  | 713 | 813 | 675 | 820 | 752 | 497 | 657 | 735 |
| 170 |  |  |  |  | 799 | 680 | 813 | 712 | 542 | 692 | 735 |
| 71 | 960 | 784 | 753 | 691 | 792 | 674 | 812 | 744 | 462 | 697 | 737 |
| 215 |  |  |  |  |  |  | 792 | 751 | 508 | 702 | 739 |
| **140** |  | **814** | **739** |  | **801** | **680** | **814** | **703** | **535** | **728** | **741** |
| 175 |  |  |  |  | 805 | 642 | 806 | 758 | 570 | 692 | 741 |
| 1 | 942 | 803 | 782 | 717 | 781 | 664 | 773 | 749 | 564 | 645 | 742 |
| 39 | 922 | 820 | 804 | 690 | 797 | 666 | 745 | 756 | 545 | 674 | 742 |
| 35 | 953 | 803 | 742 | 675 | 805 | 665 | 798 | 760 | 551 | 673 | 742 |
| 205 |  |  |  |  |  |  | 776 | 801 | 508 | 684 | 744 |
| 260 |  |  |  |  |  |  |  |  | 584 | 694 | 747 |
| 38 | 979 |  |  |  |  | 719 | 769 | 691 | 520 | 720 | 747 |
| 98 | 946 | 817 | 741 | 691 | 804 | 697 | 787 | 733 | 569 | 706 | 749 |
| 216 |  |  |  |  |  |  | 801 | 730 | 553 | 723 | 753 |
| 148 |  |  | 802 | 699 | 854 | 675 | 771 | 869 | 542 | 686 | 763 |
| 21 | 995 | 827 | 800 | 744 | 826 | 687 | 856 | 726 | 438 | 734 | 763 |
| 102 | 975 | 828 | 820 | 739 | 822 | 723 | 821 | 685 | 521 | 707 | 764 |
| 180 |  |  |  |  |  | 715 | 843 | 745 | 599 | 713 | 772 |
| **96** | **1006** | **809** | **795** | **702** | **838** | **704** | **827** | **765** | **540** | **741** | **772** |
| 181 |  |  |  |  |  | 716 | 817 | 809 | 566 | 719 | 774 |
| 20 | 975 |  | 801 |  |  |  | 726 | 807 |  | 734 | 783 |
| 28 | 1044 | 848 | 865 | 753 | 836 | 718 | 766 | 803 | 522 | 748 | 790 |
| 222 |  |  |  |  |  |  | 811 | 839 | 564 | 775 | 798 |
| 221 |  |  |  |  |  |  | 819 | 812 | 591 | 780 | 802 |
| 257 |  |  |  |  |  |  |  |  | 655 | 734 | 802 |
| 52 | 1024 | 895 |  |  |  |  | 719 | 829 |  | 721 | 806 |
| 97 | 1104 | 959 | 937 | 863 | 907 | 736 | 886 | 717 | 662 | 761 | 853 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise.xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
| 262 |  |  |  |  |  |  |  |  | 247 | 301 | 382 |
| 263 |  |  |  |  |  |  |  |  | 234 | 353 | 401 |
| 287 |  |  |  |  |  |  |  |  |  | 349 | 406 |
| 284 |  |  |  |  |  |  |  |  |  | 357 | 413 |
| 283 |  |  |  |  |  |  |  |  |  | 381 | 437 |
| 288 |  |  |  |  |  |  |  |  |  | 422 | 478 |
| 290 |  |  |  |  |  |  |  |  |  | 433 | 489 |
| 289 |  |  |  |  |  |  |  |  |  | 434 | 490 |
| 303 |  |  |  |  |  |  |  |  |  | 449 | 506 |
| 275 |  |  |  |  |  |  |  |  | 341 | 469 | 512 |
| 269 |  |  |  |  |  |  |  |  | 351 | 467 | 516 |
| 297 |  |  |  |  |  |  |  |  |  | 463 | 519 |
| 302 |  |  |  |  |  |  |  |  |  | 468 | 525 |
| 277 |  |  |  |  |  |  |  |  | 417 | 456 | 544 |
| 274 |  |  |  |  |  |  |  |  | 405 | 481 | 550 |
| 228 |  |  |  |  |  |  |  | 671 | 467 | 624 | 664 |
| 270 |  |  |  |  |  |  |  |  | 557 | 616 | 694 |
| 293 |  |  |  |  |  |  |  |  |  | 650 | 707 |
| 267 |  |  |  |  |  |  |  |  | 591 | 642 | 724 |
| 295 |  |  |  |  |  |  |  |  |  | 677 | 733 |
| 273 |  |  |  |  |  |  |  |  | 549 | 716 | 740 |
| 292 |  |  |  |  |  |  |  |  |  | 685 | 741 |
| 300 |  |  |  |  |  |  |  |  |  | 700 | 757 |
| 291 |  |  |  |  |  |  |  |  |  | 704 | 761 |
| 272 |  |  |  |  |  |  |  |  | 580 | 726 | 761 |
| 294 |  |  |  |  |  |  |  |  |  | 707 | 764 |
| 299 |  |  |  |  |  |  |  |  |  | 713 | 769 |
| 298 |  |  |  |  |  |  |  |  |  | 751 | 808 |
| 296 |  |  |  |  |  |  |  |  |  | 783 | 839 |
| 301 |  |  |  |  |  |  |  |  |  | 784 | 840 |
|  |  |  |  |  |  |  |  |  |  |  |  |

[1] bold font: delineating variety

[2] Ref’: reference varieties / Cand’: candidate varieties

[Annex III follows]

PRACTICAL EXERCISE OF ITALY

## Italian procedure

1. Averages range of historical means: 329,00 – 853,20 mm (~ **525 mm**).

2. Because in “flax” the averages distribution is not normal and has two maximums (see histogram and descriptive statistics – file excel) it was preferred to use the *median (591mm*) instead of the average (535mm) as “reference point”.

Conditions for partitioning into states (9 notes):

* Leave a space for future expansion
* Equal notes
* Take into consideration example varieties (and past varietal descriptions)
* Calibration to determine the space of each note

Calculus based on conditions and experience:

3. **525 mm** + [some space at the lowest limit (note 1) and at the upper limit of the range (note 9)] = ~ 585 mm.

585 / 9 notes= 65 mm (space of each note).





|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flax | Characteristic: Stem: length from cotyledon scar to top boll Over-year-mean | | | | | | | | | |  |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!A190) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | Over-year mean |
|
|
| **14** | **470** | **350** | **347** | **339** | **397** | **368** | **338** | **338** | **272** | **333** | 355 |
| **169** |  |  |  |  | **488** | **324** | **384** | **387** | **240** | **301** | 383 |
| **168** |  |  |  |  | **516** | **293** | **422** | **357** | **290** | **288** | 390 |
| **45** | **470** | **390** | **375** | **354** | **458** |  | **427** | **362** | **318** | **403** | 390.6 |
| **184** |  |  |  |  |  | **351** | **407** | **342** | **276** | **339** | 392 |
| **83** | **545** | **402** | **403** | **350** | **472** | **342** | **444** | **397** | **303** | **309** | 396.6 |
| **128** | **548** | **415** | **418** | **338** | **516** | **328** | **449** | **372** | **274** | **334** | 399.1 |
| **44** | **443** |  | **454** |  | **422** |  |  |  | **288** | **422** | 399.2 |
| **166** |  |  |  | **380** | **465** | **330** | **465** | **263** | **356** | **352** | 404.8 |
| **173** |  |  |  |  | **485** | **422** | **423** | **325** | **264** | **349** | 407 |
| **202** |  |  |  |  |  |  | **447** | **351** | **245** | **382** | 407.6 |
| **40** | **476** | **397** | **424** | **381** | **449** | **419** | **385** | **395** | **350** | **406** | 408.2 |
| **124** | **462** |  |  |  |  | **484** | **362** | **383** | **273** | **412** | 410 |
| **160** |  |  |  | **352** | **439** | **375** | **391** | **408** | **345** | **354** | 412.1 |
| **79** | **534** | **391** | **399** | **379** | **483** | **448** | **437** | **385** | **356** | **312** | **412.4** |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!A190) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | Over-year mean |
|
|
| **286** |  |  |  |  |  |  |  |  |  | **358** | 414.1 |
| **178** |  |  |  |  |  | **383** | **429** | **368** | **277** | **379** | 416.2 |
| **203** |  |  |  |  |  |  | **415** | **367** | **295** | **385** | 416.7 |
| **182** |  |  |  |  |  | **446** | **375** | **375** | **317** | **329** | 417.4 |
| **24** | **461** | **426** | **469** | **416** | **439** | **439** | **452** | **347** | **321** | **425** | 419.3 |
| **149** |  |  | **387** |  | **435** | **429** | **455** | **364** | **384** | **335** | 421.1 |
| **82** | **636** | **444** | **459** | **400** | **558** | **343** | **451** | **368** | **263** | **309** | 422.9 |
| **197** |  |  |  |  |  |  | **429** | **487** | **233** | **354** | 426.7 |
| **219** |  |  |  |  |  |  | **430** | **365** | **310** | **402** | 427.8 |
| **144** |  | **455** | **439** |  |  |  | **443** |  |  | **407** | 428.9 |
| **247** |  |  |  |  |  |  |  | **413** |  | **378** | 430 |
| **30** | **632** | **441** | **427** | **384** | **518** | **360** | **424** | **461** | **299** | **360** | 430.4 |
| **103** | **574** | **460** |  |  |  |  |  |  | **286** | **408** | 434.1 |
| **73** | **500** |  |  |  |  |  |  | **407** | **339** | **424** | 434.5 |
| **281** |  |  |  |  |  |  |  |  | **270** | **388** | 436.5 |
| **224** |  |  |  |  |  |  | **414** | **445** | **307** | **377** | 436.8 |
| **151** |  |  | **494** | **420** | **481** | **348** | **431** | **404** | **315** | **415** | 439.1 |
| **195** |  |  |  |  |  | **407** | **439** | **414** | **356** | **336** | 439.4 |
| **26** | **519** |  |  |  |  |  |  |  |  | **467** | 440.4 |
| **85** | **541** | **457** | **458** | **403** | **502** | **439** | **449** | **388** | **356** | **416** | 440.8 |
| **56** |  |  |  |  |  |  |  |  | **344** | **328** | 443.3 |
| **152** |  |  | **411** | **363** | **562** | **430** | **496** | **349** | **355** | **384** | 444.5 |
| **88** | **515** |  |  |  |  |  |  |  | **344** | **420** | 444.5 |
| **226** |  |  |  |  |  |  |  | **399** | **340** | **366** | 444.6 |
| **250** |  |  |  |  |  |  |  | **428** |  | **404** | 450.8 |
| **154** |  |  | **411** | **405** |  | **408** | **469** | **486** |  | **426** | 453.7 |
| **280** |  |  |  |  |  |  |  |  | **285** | **413** | 456.6 |
| **201** |  |  |  |  |  |  | **456** | **519** | **287** | **362** | 457.2 |
| **87** | **564** | **445** | **443** | **438** | **542** | **449** | **522** | **462** | **340** | **435** | 463.7 |
| **196** |  |  |  |  |  |  | **483** | **436** | **347** | **394** | 466.3 |
| **248** |  |  |  |  |  |  |  | **404** | **359** | **417** | 469.2 |
| **76** | **615** |  |  |  |  | **491** | **426** | **461** | **317** | **420** | **469.3** |
| **251** |  |  |  |  |  |  |  | **457** | **359** | **364** | 469.3 |
| **183** |  |  |  |  |  | **462** | **441** | **368** | **412** | **418** | 469.4 |
| **177** |  |  |  |  |  |  |  |  | **318** | **407** | 470 |
| **80** | **589** |  |  |  |  |  |  |  | **341** | **436** | 473.3 |
| **174** |  |  |  |  | **527** | **484** | **473** | **455** | **360** | **372** | 474.1 |
| **231** |  |  |  |  |  |  |  | **425** | **393** | **380** | 475.3 |
| **153** |  |  | **433** | **424** | **565** | **480** | **515** | **471** | **354** | **361** | 476 |
| **239** |  |  |  |  |  |  |  | **434** | **358** | **411** | 477.3 |
| **212** |  |  |  |  |  |  | **441** | **474** | **411** | **382** | 478.2 |
| **84** | **610** | **534** | **486** | **443** | **539** | **492** | **491** | **423** | **397** | **397** | 481.1 |
| **238** |  |  |  |  |  |  |  | **465** | **318** | **440** | 483.5 |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!A190) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | Over-year mean |
|
|
| **113** | **649** |  |  | **434** |  |  |  |  | **318** | **435** | 484.4 |
| **163** |  |  |  | **414** | **574** | **488** | **469** | **453** | **352** | **421** | 484.5 |
| **243** |  |  |  |  |  |  |  | **516** | **304** | **409** | 485.4 |
| **230** |  |  |  |  |  |  |  | **399** | **430** | **405** | 487.5 |
| **249** |  |  |  |  |  |  |  | **479** | **388** | **392** | 495.5 |
| **136** | **604** | **537** | **522** | **436** | **570** | **496** | **540** | **498** | **362** | **396** | 495.9 |
| **61** | **713** |  |  | **437** |  | **523** | **491** | **497** | **338** | **350** | 497.1 |
| **78** | **653** | **575** | **547** | **408** | **555** |  |  |  | **314** | **460** | 497.2 |
| **115** | **721** | **525** | **496** | **438** | **607** | **409** | **526** | **514** | **344** | **410** | 498.8 |
| **278** |  |  |  |  |  |  |  |  | **345** | **438** | 498.9 |
| **131** | **654** | **515** | **496** | **455** | **622** | **476** | **528** | **512** | **344** | **450** | 505.1 |
| **204** |  |  |  |  |  |  | **553** | **496** | **338** | **441** | 508.2 |
| **17** | **652** | **575** | **557** | **455** | **541** |  |  |  |  | **461** | 508.4 |
| **285** |  |  |  |  |  |  |  |  |  | **454** | 510 |
| **109** | **621** | **556** | **482** |  |  |  | **511** | **457** | **464** | **498** | 510.1 |
| **63** | **597** | **549** | **507** | **468** | **585** | **526** | **565** | **494** | **429** | **400** | 511.8 |
| **189** |  |  |  |  |  | **496** | **558** | **476** | **324** | **466** | 512.9 |
| **146** |  | **595** | **564** | **449** | **625** | **360** | **543** | **526** | **381** | **423** | **514.0** |
| **252** |  |  |  |  |  |  |  | **489** | **379** | **447** | 514.4 |
| **172** |  |  |  |  | **553** | **487** | **539** | **553** | **385** | **407** | 516.2 |
| **114** | **737** |  |  |  |  | **542** | **482** | **468** | **386** | **415** | 519.2 |
| **213** |  |  |  |  |  |  | **557** | **468** | **399** | **459** | 521.8 |
| **143** |  | **544** | **586** | **469** | **620** | **376** | **563** | **519** | **402** | **479** | 524.2 |
| **121** | **663** |  |  |  |  |  |  |  | **363** | **494** | 524.7 |
| **132** | **728** | **540** | **524** | **465** | **640** | **517** | **549** | **533** | **346** | **406** | 524.8 |
| **179** |  |  |  |  |  | **462** | **646** | **484** | **259** | **540** | 527.4 |
| **147** |  | **578** | **533** | **487** | **620** | **522** | **508** | **553** | **382** | **405** | 527.5 |
| **214** |  |  |  |  |  |  | **569** | **519** | **386** | **434** | 528.2 |
| **159** |  |  |  | **436** | **580** |  |  |  | **399** | **535** | 535.3 |
| **90** | **764** | **564** | **495** | **460** | **640** | **528** | **554** | **579** | **393** | **456** | 543.1 |
| **167** |  |  |  | **493** | **621** |  |  |  |  | **491** | 545.7 |
| **33** | **737** | **612** | **549** | **461** | **654** | **626** | **581** | **479** | **376** | **423** | 549.7 |
| **190** |  |  |  |  |  | **507** | **552** | **558** | **416** | **488** | 553.1 |
| **164** |  |  |  | **491** | **611** | **475** | **572** | **571** | **449** | **492** | **554.5** |
| **70** | **752** |  |  |  |  |  |  | **506** | **365** | **540** | 557.3 |
| **279** |  |  |  |  |  |  |  |  | **389** | **537** | 570.3 |
| **42** | **712** | **748** | **612** | **590** | **709** | **565** | **699** | **560** |  | **572** | 623 |
| **200** |  |  |  |  |  |  | **685** | **623** | **410** | **604** | 632 |
| **229** |  |  |  |  |  |  |  | **601** | **471** | **645** | 648.3 |
| **208** |  |  |  |  |  |  | **726** | **719** | **378** | **605** | 658.2 |
| **77** | **875** |  | **697** | **611** | **795** | **580** | **714** | **675** | **399** | **626** | **668.7** |
| **227** |  |  |  |  |  |  |  | **702** | **472** | **639** | 680.5 |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!A190) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | Over-year mean |
|
|
| **157** |  |  | **712** | **683** | **725** | **665** | **733** | **691** | **415** | **616** | 680.6 |
| **282** |  |  |  |  |  |  |  |  | **475** | **672** | 680.7 |
| **49** | **874** | **769** | **712** | **630** | **746** | **558** | **739** | **661** | **493** | **634** | 681.6 |
| **188** |  |  |  |  |  | **646** | **719** | **675** | **485** | **649** | 683.8 |
| **156** |  |  | **714** | **684** | **766** | **692** | **749** | **712** | **391** | **638** | 694 |
| **244** |  |  |  |  |  |  |  | **699** | **527** | **629** | 694.4 |
| **253** |  |  |  |  |  |  |  | **729** | **486** | **663** | 702.2 |
| **36** | **926** | **783** | **726** | **643** | **775** | **621** | **743** | **662** | **518** | **633** | **702.8** |
| **130** | **902** | **770** | **723** | **675** | **782** | **660** | **779** | **665** | **509** | **639** | 710.3 |
| **185** |  |  |  |  |  | **621** | **752** | **752** | **491** | **695** | 711.2 |
| **241** |  |  |  |  |  |  |  | **692** | **503** | **725** | 716.1 |
| **206** |  |  |  |  |  |  | **712** | **714** | **629** | **626** | 721.7 |
| **150** |  |  | **733** | **682** | **824** | **668** | **781** | **729** | **471** | **680** | 721.8 |
| **209** |  |  |  |  |  |  | **727** | **771** | **518** | **667** | 722 |
| **258** |  |  |  |  |  |  |  |  | **578** | **651** | 722 |
| **217** |  |  |  |  |  |  | **709** | **733** | **532** | **713** | 723.1 |
| **142** |  | **811** | **769** | **666** | **804** | **641** | **715** | **750** | **481** | **714** | 723.4 |
| **211** |  |  |  |  |  |  | **763** | **743** | **567** | **624** | 725.6 |
| **158** |  |  | **774** | **694** | **771** | **662** | **750** | **805** | **533** | **629** | 727.9 |
| **99** | **955** | **814** | **760** | **647** | **791** | **664** | **746** | **714** | **476** | **719** | 728.3 |
| **237** |  |  |  |  |  |  |  | **754** | **520** | **690** | 730.9 |
| **12** | **916** | **827** | **736** | **659** | **788** | **722** | **750** | **729** | **531** | **662** | 731.9 |
| **210** |  |  |  |  |  |  | **737** | **765** | **595** | **628** | 732.3 |
| **207** |  |  |  |  |  |  | **804** | **730** | **555** | **638** | 732.6 |
| **268** |  |  |  |  |  |  |  |  | **590** | **662** | 733.1 |
| **225** |  |  |  |  |  |  | **701** | **737** |  | **721** | 735.1 |
| **165** |  |  |  | **713** | **813** | **675** | **820** | **752** | **497** | **657** | 735.3 |
| **170** |  |  |  |  | **799** | **680** | **813** | **712** | **542** | **692** | 735.3 |
| **71** | **960** | **784** | **753** | **691** | **792** | **674** | **812** | **744** | **462** | **697** | 736.7 |
| **215** |  |  |  |  |  |  | **792** | **751** | **508** | **702** | 739.4 |
| **140** |  | **814** | **739** |  | **801** | **680** | **814** | **703** | **535** | **728** | **740.7** |
| **175** |  |  |  |  | **805** | **642** | **806** | **758** | **570** | **692** | 741.1 |
| **1** | **942** | **803** | **782** | **717** | **781** | **664** | **773** | **749** | **564** | **645** | 741.7 |
| **39** | **922** | **820** | **804** | **690** | **797** | **666** | **745** | **756** | **545** | **674** | 741.7 |
| **35** | **953** | **803** | **742** | **675** | **805** | **665** | **798** | **760** | **551** | **673** | 742.4 |
| **205** |  |  |  |  |  |  | **776** | **801** | **508** | **684** | 743.5 |
| **260** |  |  |  |  |  |  |  |  | **584** | **694** | 746.5 |
| **38** | **979** |  |  |  |  | **719** | **769** | **691** | **520** | **720** | 746.9 |
| **98** | **946** | **817** | **741** | **691** | **804** | **697** | **787** | **733** | **569** | **706** | 749 |
| **216** |  |  |  |  |  |  | **801** | **730** | **553** | **723** | 753 |
| **148** |  |  | **802** | **699** | **854** | **675** | **771** | **869** | **542** | **686** | 762.6 |
| **21** | **995** | **827** | **800** | **744** | **826** | **687** | **856** | **726** | **438** | **734** | 763 |
| **102** | **975** | **828** | **820** | **739** | **822** | **723** | **821** | **685** | **521** | **707** | 764 |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!A190) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | Over-year mean |
|
|
| **180** |  |  |  |  |  | **715** | **843** | **745** | **599** | **713** | 772 |
| **96** | **1006** | **809** | **795** | **702** | **838** | **704** | **827** | **765** | **540** | **741** | **772.3** |
| **181** |  |  |  |  |  | **716** | **817** | **809** | **566** | **719** | 774.4 |
| **20** | **975** |  | **801** |  |  |  | **726** | **807** |  | **734** | 782.5 |
| **28** | **1044** | **848** | **865** | **753** | **836** | **718** | **766** | **803** | **522** | **748** | 790.2 |
| **222** |  |  |  |  |  |  | **811** | **839** | **564** | **775** | 798.2 |
| **221** |  |  |  |  |  |  | **819** | **812** | **591** | **780** | 801.7 |
| **257** |  |  |  |  |  |  |  |  | **655** | **734** | 801.9 |
| **52** | **1024** | **895** |  |  |  |  | **719** | **829** |  | **721** | 805.7 |
| **97** | **1104** | **959** | **937** | **863** | **907** | **736** | **886** | **717** | **662** | **761** | 853.1 |
| **262** |  |  |  |  |  |  |  |  | **247** | **301** | 381.7 |
| **263** |  |  |  |  |  |  |  |  | **234** | **353** | 400.7 |
| **287** |  |  |  |  |  |  |  |  |  | **349** | 405.7 |
| **284** |  |  |  |  |  |  |  |  |  | **357** | 413.4 |
| **283** |  |  |  |  |  |  |  |  |  | **381** | 437.1 |
| **288** |  |  |  |  |  |  |  |  |  | **422** | 478.1 |
| **290** |  |  |  |  |  |  |  |  |  | **433** | 489 |
| **289** |  |  |  |  |  |  |  |  |  | **434** | 490.4 |
| **303** |  |  |  |  |  |  |  |  |  | **449** | 505.6 |
| **275** |  |  |  |  |  |  |  |  | **341** | **469** | 512.2 |
| **269** |  |  |  |  |  |  |  |  | **351** | **467** | 516.2 |
| **297** |  |  |  |  |  |  |  |  |  | **463** | 518.8 |
| **302** |  |  |  |  |  |  |  |  |  | **468** | 524.6 |
| **277** |  |  |  |  |  |  |  |  | **417** | **456** | 544.1 |
| **274** |  |  |  |  |  |  |  |  | **405** | **481** | 550.2 |
| **228** |  |  |  |  |  |  |  | **671** | **467** | **624** | 663.5 |
| **270** |  |  |  |  |  |  |  |  | **557** | **616** | 693.8 |
| **293** |  |  |  |  |  |  |  |  |  | **650** | 706.6 |
| **267** |  |  |  |  |  |  |  |  | **591** | **642** | 723.8 |
| **295** |  |  |  |  |  |  |  |  |  | **677** | 733.3 |
| **273** |  |  |  |  |  |  |  |  | **549** | **716** | 739.9 |
| **292** |  |  |  |  |  |  |  |  |  | **685** | 741.3 |
| **300** |  |  |  |  |  |  |  |  |  | **700** | 756.6 |
| **291** |  |  |  |  |  |  |  |  |  | **704** | 760.5 |
| **272** |  |  |  |  |  |  |  |  | **580** | **726** | 760.6 |
| **294** |  |  |  |  |  |  |  |  |  | **707** | 763.7 |
| **299** |  |  |  |  |  |  |  |  |  | **713** | 769.2 |
| **298** |  |  |  |  |  |  |  |  |  | **751** | 807.5 |
| **296** |  |  |  |  |  |  |  |  |  | **783** | 839 |
| **301** |  |  |  |  |  |  |  |  |  | **784** | 840.3 |

[1] bold font: delineating variety

[2] Ref’: reference varieties / Cand’: candidate varieties

|  |  |
| --- | --- |
| Flax | Characteristic: Stem: length from cotyledon scar to top boll: Average of historical mean |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!_ftn1) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | average of historical means |
|
|
| **281** |  |  |  |  |  |  |  |  | **270** | **388** | 329.00 |
| **56** |  |  |  |  |  |  |  |  | **344** | **328** | 336.00 |
| **184** |  |  |  |  |  | **351** | **407** | **342** | **276** | **339** | 343.00 |
| **280** |  |  |  |  |  |  |  |  | **285** | **413** | 349.00 |
| **169** |  |  |  |  | **488** | **324** | **384** | **387** | **240** | **301** | 354.00 |
| **14** | **470** | **350** | **347** | **339** | **397** | **368** | **338** | **338** | **272** | **333** | 355.20 |
| **202** |  |  |  |  |  |  | **447** | **351** | **245** | **382** | 356.25 |
| **286** |  |  |  |  |  |  |  |  |  | **358** | 358.00 |
| **168** |  |  |  |  | **516** | **293** | **422** | **357** | **290** | **288** | 361.00 |
| **177** |  |  |  |  |  |  |  |  | **318** | **407** | 362.50 |
| **203** |  |  |  |  |  |  | **415** | **367** | **295** | **385** | 365.50 |
| **178** |  |  |  |  |  | **383** | **429** | **368** | **277** | **379** | 367.20 |
| **226** |  |  |  |  |  |  |  | **399** | **340** | **366** | 368.33 |
| **182** |  |  |  |  |  | **446** | **375** | **375** | **317** | **329** | 368.40 |
| **166** |  |  |  | **380** | **465** | **330** | **465** | **263** | **356** | **352** | 373.00 |
| **197** |  |  |  |  |  |  | **429** | **487** | **233** | **354** | 375.75 |
| **219** |  |  |  |  |  |  | **430** | **365** | **310** | **402** | 376.75 |
| **173** |  |  |  |  | **485** | **422** | **423** | **325** | **264** | **349** | 378.00 |
| **160** |  |  |  | **352** | **439** | **375** | **391** | **408** | **345** | **354** | 380.57 |
| **224** |  |  |  |  |  |  | **414** | **445** | **307** | **377** | 385.75 |
| **195** |  |  |  |  |  | **407** | **439** | **414** | **356** | **336** | 390.40 |
| **278** |  |  |  |  |  |  |  |  | **345** | **438** | 391.50 |
| **248** |  |  |  |  |  |  |  | **404** | **359** | **417** | 393.33 |
| **251** |  |  |  |  |  |  |  | **457** | **359** | **364** | 393.33 |
| **45** | **470** | **390** | **375** | **354** | **458** |  | **427** | **362** | **318** | **403** | 395.22 |
| **247** |  |  |  |  |  |  |  | **413** |  | **378** | 395.50 |
| **124** | **462** |  |  |  |  | **484** | **362** | **383** | **273** | **412** | 396.00 |
| **83** | **545** | **402** | **403** | **350** | **472** | **342** | **444** | **397** | **303** | **309** | 396.70 |
| **149** |  |  | **387** |  | **435** | **429** | **455** | **364** | **384** | **335** | 398.43 |
| **128** | **548** | **415** | **418** | **338** | **516** | **328** | **449** | **372** | **274** | **334** | 399.20 |
| **231** |  |  |  |  |  |  |  | **425** | **393** | **380** | 399.33 |
| **239** |  |  |  |  |  |  |  | **434** | **358** | **411** | 401.00 |
| **44** | **443** |  | **454** |  | **422** |  |  |  | **288** | **422** | 405.80 |
| **201** |  |  |  |  |  |  | **456** | **519** | **287** | **362** | 406.00 |
| **238** |  |  |  |  |  |  |  | **465** | **318** | **440** | 407.67 |
| **40** | **476** | **397** | **424** | **381** | **449** | **419** | **385** | **395** | **350** | **406** | 408.20 |
| **243** |  |  |  |  |  |  |  | **516** | **304** | **409** | 409.67 |
| **230** |  |  |  |  |  |  |  | **399** | **430** | **405** | 411.33 |
| **79** | **534** | **391** | **399** | **379** | **483** | **448** | **437** | **385** | **356** | **312** | 412.40 |
| **151** |  |  | **494** | **420** | **481** | **348** | **431** | **404** | **315** | **415** | 413.50 |
| **196** |  |  |  |  |  |  | **483** | **436** | **347** | **394** | 415.00 |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!_ftn1) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | average of historical means |
|
| **250** |  |  |  |  |  |  |  | **428** |  | **404** | 416.00 |
| **73** | **500** |  |  |  |  |  |  | **407** | **339** | **424** | 417.50 |
| **152** |  |  | **411** | **363** | **562** | **430** | **496** | **349** | **355** | **384** | 418.75 |
| **24** | **461** | **426** | **469** | **416** | **439** | **439** | **452** | **347** | **321** | **425** | 419.50 |
| **249** |  |  |  |  |  |  |  | **479** | **388** | **392** | 419.67 |
| **183** |  |  |  |  |  | **462** | **441** | **368** | **412** | **418** | 420.20 |
| **82** | **636** | **444** | **459** | **400** | **558** | **343** | **451** | **368** | **263** | **309** | 423.10 |
| **88** | **515** |  |  |  |  |  |  |  | **344** | **420** | 426.33 |
| **212** |  |  |  |  |  |  | **441** | **474** | **411** | **382** | 427.00 |
| **30** | **632** | **441** | **427** | **384** | **518** | **360** | **424** | **461** | **299** | **360** | 430.60 |
| **103** | **574** | **460** |  |  |  |  |  |  | **286** | **408** | 432.00 |
| **154** |  |  | **411** | **405** |  | **408** | **469** | **486** |  | **426** | 434.17 |
| **144** |  | **455** | **439** |  |  |  | **443** |  |  | **407** | 436.00 |
| **252** |  |  |  |  |  |  |  | **489** | **379** | **447** | 438.33 |
| **85** | **541** | **457** | **458** | **403** | **502** | **439** | **449** | **388** | **356** | **416** | 440.90 |
| **174** |  |  |  |  | **527** | **484** | **473** | **455** | **360** | **372** | 445.17 |
| **153** |  |  | **433** | **424** | **565** | **480** | **515** | **471** | **354** | **361** | 450.38 |
| **163** |  |  |  | **414** | **574** | **488** | **469** | **453** | **352** | **421** | 453.00 |
| **285** |  |  |  |  |  |  |  |  |  | **454** | 454.00 |
| **76** | **615** |  |  |  |  | **491** | **426** | **461** | **317** | **420** | 455.00 |
| **80** | **589** |  |  |  |  |  |  |  | **341** | **436** | 455.33 |
| **204** |  |  |  |  |  |  | **553** | **496** | **338** | **441** | 457.00 |
| **113** | **649** |  |  | **434** |  |  |  |  | **318** | **435** | 459.00 |
| **279** |  |  |  |  |  |  |  |  | **389** | **537** | 463.00 |
| **87** | **564** | **445** | **443** | **438** | **542** | **449** | **522** | **462** | **340** | **435** | 464.00 |
| **189** |  |  |  |  |  | **496** | **558** | **476** | **324** | **466** | 464.00 |
| **213** |  |  |  |  |  |  | **557** | **468** | **399** | **459** | 470.75 |
| **,** |  |  |  |  |  |  | **569** | **519** | **386** | **434** | 477.00 |
| **179** |  |  |  |  |  | **462** | **646** | **484** | **259** | **540** | 478.20 |
| **61** | **713** |  |  | **437** |  | **523** | **491** | **497** | **338** | **350** | 478.43 |
| **84** | **610** | **534** | **486** | **443** | **539** | **492** | **491** | **423** | **397** | **397** | 481.20 |
| **172** |  |  |  |  | **553** | **487** | **539** | **553** | **385** | **407** | 487.33 |
| **159** |  |  |  | **436** | **580** |  |  |  | **399** | **535** | 487.50 |
| **26** | **519** |  |  |  |  |  |  |  |  | **467** | 493.00 |
| **136** | **604** | **537** | **522** | **436** | **570** | **496** | **540** | **498** | **362** | **396** | 496.10 |
| **146** |  | **595** | **564** | **449** | **625** | **360** | **543** | **526** | **381** | **423** | 496.22 |
| **115** | **721** | **525** | **496** | **438** | **607** | **409** | **526** | **514** | **344** | **410** | 499.00 |
| **78** | **653** | **575** | **547** | **408** | **555** |  |  |  | **314** | **460** | 501.71 |
| **190** |  |  |  |  |  | **507** | **552** | **558** | **416** | **488** | 504.20 |
| **114** | **737** |  |  |  |  | **542** | **482** | **468** | **386** | **415** | 505.00 |
| **131** | **654** | **515** | **496** | **455** | **622** | **476** | **528** | **512** | **344** | **450** | 505.20 |
| **143** |  | **544** | **586** | **469** | **620** | **376** | **563** | **519** | **402** | **479** | 506.44 |
| **121** | **663** |  |  |  |  |  |  |  | **363** | **494** | 506.67 |
| **147** |  | **578** | **533** | **487** | **620** | **522** | **508** | **553** | **382** | **405** | 509.78 |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!_ftn1) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | average of historical means |
|
| **63** | **597** | **549** | **507** | **468** | **585** | **526** | **565** | **494** | **429** | **400** | 512.00 |
| **109** | **621** | **556** | **482** |  |  |  | **511** | **457** | **464** | **498** | 512.71 |
| **164** |  |  |  | **491** | **611** | **475** | **572** | **571** | **449** | **492** | 523.00 |
| **132** | **728** | **540** | **524** | **465** | **640** | **517** | **549** | **533** | **346** | **406** | 524.80 |
| **167** |  |  |  | **493** | **621** |  |  |  |  | **491** | 535.00 |
| **17** | **652** | **575** | **557** | **455** | **541** |  |  |  |  | **461** | 540.17 |
| **70** | **752** |  |  |  |  |  |  | **506** | **365** | **540** | 540.75 |
| **90** | **764** | **564** | **495** | **460** | **640** | **528** | **554** | **579** | **393** | **456** | 543.30 |
| **33** | **737** | **612** | **549** | **461** | **654** | **626** | **581** | **479** | **376** | **423** | 549.80 |
| **229** |  |  |  |  |  |  |  | **601** | **471** | **645** | 572.33 |
| **282** |  |  |  |  |  |  |  |  | **475** | **672** | 573.50 |
| **200** |  |  |  |  |  |  | **685** | **623** | **410** | **604** | 580.50 |
| **227** |  |  |  |  |  |  |  | **702** | **472** | **639** | 604.33 |
| **208** |  |  |  |  |  |  | **726** | **719** | **378** | **605** | 607.00 |
| **258** |  |  |  |  |  |  |  |  | **578** | **651** | 614.50 |
| **244** |  |  |  |  |  |  |  | **699** | **527** | **629** | 618.33 |
| **253** |  |  |  |  |  |  |  | **729** | **486** | **663** | 626.00 |
| **268** |  |  |  |  |  |  |  |  | **590** | **662** | 626.00 |
| **188** |  |  |  |  |  | **646** | **719** | **675** | **485** | **649** | 634.80 |
| **260** |  |  |  |  |  |  |  |  | **584** | **694** | 639.00 |
| **241** |  |  |  |  |  |  |  | **692** | **503** | **725** | 640.00 |
| **42** | **712** | **748** | **612** | **590** | **709** | **565** | **699** | **560** |  | **572** | 640.78 |
| **237** |  |  |  |  |  |  |  | **754** | **520** | **690** | 654.67 |
| **157** |  |  | **712** | **683** | **725** | **665** | **733** | **691** | **415** | **616** | 655.00 |
| **185** |  |  |  |  |  | **621** | **752** | **752** | **491** | **695** | 662.20 |
| **77** | **875** |  | **697** | **611** | **795** | **580** | **714** | **675** | **399** | **626** | 663.56 |
| **156** |  |  | **714** | **684** | **766** | **692** | **749** | **712** | **391** | **638** | 668.25 |
| **206** |  |  |  |  |  |  | **712** | **714** | **629** | **626** | 670.25 |
| **209** |  |  |  |  |  |  | **727** | **771** | **518** | **667** | 670.75 |
| **217** |  |  |  |  |  |  | **709** | **733** | **532** | **713** | 671.75 |
| **211** |  |  |  |  |  |  | **763** | **743** | **567** | **624** | 674.25 |
| **210** |  |  |  |  |  |  | **737** | **765** | **595** | **628** | 681.25 |
| **49** | **874** | **769** | **712** | **630** | **746** | **558** | **739** | **661** | **493** | **634** | 681.60 |
| **207** |  |  |  |  |  |  | **804** | **730** | **555** | **638** | 681.75 |
| **215** |  |  |  |  |  |  | **792** | **751** | **508** | **702** | 688.25 |
| **205** |  |  |  |  |  |  | **776** | **801** | **508** | **684** | 692.25 |
| **257** |  |  |  |  |  |  |  |  | **655** | **734** | 694.50 |
| **150** |  |  | **733** | **682** | **824** | **668** | **781** | **729** | **471** | **680** | 696.00 |
| **216** |  |  |  |  |  |  | **801** | **730** | **553** | **723** | 701.75 |
| **158** |  |  | **774** | **694** | **771** | **662** | **750** | **805** | **533** | **629** | 702.25 |
| **36** | **926** | **783** | **726** | **643** | **775** | **621** | **743** | **662** | **518** | **633** | 703.00 |
| **165** |  |  |  | **713** | **813** | **675** | **820** | **752** | **497** | **657** | 703.86 |
| **142** |  | **811** | **769** | **666** | **804** | **641** | **715** | **750** | **481** | **714** | 705.67 |
| **170** |  |  |  |  | **799** | **680** | **813** | **712** | **542** | **692** | 706.33 |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!_ftn1) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | average of historical means |
|
| **130** | **902** | **770** | **723** | **675** | **782** | **660** | **779** | **665** | **509** | **639** | 710.40 |
| **175** |  |  |  |  | **805** | **642** | **806** | **758** | **570** | **692** | 712.17 |
| **225** |  |  |  |  |  |  | **701** | **737** |  | **721** | 719.67 |
| **180** |  |  |  |  |  | **715** | **843** | **745** | **599** | **713** | 723.00 |
| **181** |  |  |  |  |  | **716** | **817** | **809** | **566** | **719** | 725.40 |
| **140** |  | **814** | **739** |  | **801** | **680** | **814** | **703** | **535** | **728** | 726.75 |
| **99** | **955** | **814** | **760** | **647** | **791** | **664** | **746** | **714** | **476** | **719** | 728.60 |
| **12** | **916** | **827** | **736** | **659** | **788** | **722** | **750** | **729** | **531** | **662** | 732.00 |
| **38** | **979** |  |  |  |  | **719** | **769** | **691** | **520** | **720** | 733.00 |
| **71** | **960** | **784** | **753** | **691** | **792** | **674** | **812** | **744** | **462** | **697** | 736.90 |
| **148** |  |  | **802** | **699** | **854** | **675** | **771** | **869** | **542** | **686** | 737.25 |
| **39** | **922** | **820** | **804** | **690** | **797** | **666** | **745** | **756** | **545** | **674** | 741.90 |
| **1** | **942** | **803** | **782** | **717** | **781** | **664** | **773** | **749** | **564** | **645** | 742.00 |
| **35** | **953** | **803** | **742** | **675** | **805** | **665** | **798** | **760** | **551** | **673** | 742.50 |
| **222** |  |  |  |  |  |  | **811** | **839** | **564** | **775** | 747.25 |
| **98** | **946** | **817** | **741** | **691** | **804** | **697** | **787** | **733** | **569** | **706** | 749.10 |
| **221** |  |  |  |  |  |  | **819** | **812** | **591** | **780** | 750.50 |
| **21** | **995** | **827** | **800** | **744** | **826** | **687** | **856** | **726** | **438** | **734** | 763.30 |
| **102** | **975** | **828** | **820** | **739** | **822** | **723** | **821** | **685** | **521** | **707** | 764.10 |
| **96** | **1006** | **809** | **795** | **702** | **838** | **704** | **827** | **765** | **540** | **741** | 772.70 |
| **28** | **1044** | **848** | **865** | **753** | **836** | **718** | **766** | **803** | **522** | **748** | 790.30 |
| **20** | **975** |  | **801** |  |  |  | **726** | **807** |  | **734** | 808.60 |
| **52** | **1024** | **895** |  |  |  |  | **719** | **829** |  | **721** | 837.60 |
| **97** | **1104** | **959** | **937** | **863** | **907** | **736** | **886** | **717** | **662** | **761** | 853.20 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Candidates varieties | | | |  |  |  |  |  |  |  |  |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!_ftn1) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | average of historical means |
|
|
| **262** |  |  |  |  |  |  |  |  | **247** | **301** | 274.00 |
| **263** |  |  |  |  |  |  |  |  | **234** | **353** | 293.50 |
| **287** |  |  |  |  |  |  |  |  |  | **349** | 349.00 |
| **284** |  |  |  |  |  |  |  |  |  | **357** | 357.00 |
| **283** |  |  |  |  |  |  |  |  |  | **381** | 381.00 |
| **275** |  |  |  |  |  |  |  |  | **341** | **469** | 405.00 |
| **269** |  |  |  |  |  |  |  |  | **351** | **467** | 409.00 |
| **288** |  |  |  |  |  |  |  |  |  | **422** | 422.00 |
| **290** |  |  |  |  |  |  |  |  |  | **433** | 433.00 |
| **289** |  |  |  |  |  |  |  |  |  | **434** | 434.00 |
| **277** |  |  |  |  |  |  |  |  | **417** | **456** | 436.50 |
| [**Variety[1]**](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\Practical%20exercise%20___ITALY.xlsx#RANGE!_ftn1) | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2009** | **2010** | **2011** | **2012** | average of historical means |
|
|
| **274** |  |  |  |  |  |  |  |  | **405** | **481** | 443.00 |
| **303** |  |  |  |  |  |  |  |  |  | **449** | 449.00 |
| **297** |  |  |  |  |  |  |  |  |  | **463** | 463.00 |
| **302** |  |  |  |  |  |  |  |  |  | **468** | 468.00 |
| **270** |  |  |  |  |  |  |  |  | **557** | **616** | 586.50 |
| **228** |  |  |  |  |  |  |  | **671** | **467** | **624** | 587.33 |
| **267** |  |  |  |  |  |  |  |  | **591** | **642** | 616.50 |
| **273** |  |  |  |  |  |  |  |  | **549** | **716** | 632.50 |
| **293** |  |  |  |  |  |  |  |  |  | **650** | 650.00 |
| **272** |  |  |  |  |  |  |  |  | **580** | **726** | 653.00 |
| **295** |  |  |  |  |  |  |  |  |  | **677** | 677.00 |
| **292** |  |  |  |  |  |  |  |  |  | **685** | 685.00 |
| **300** |  |  |  |  |  |  |  |  |  | **700** | 700.00 |
| **291** |  |  |  |  |  |  |  |  |  | **704** | 704.00 |
| **294** |  |  |  |  |  |  |  |  |  | **707** | 707.00 |
| **299** |  |  |  |  |  |  |  |  |  | **713** | 713.00 |
| **298** |  |  |  |  |  |  |  |  |  | **751** | 751.00 |
| **296** |  |  |  |  |  |  |  |  |  | **783** | 783.00 |
| **301** |  |  |  |  |  |  |  |  |  | **784** | 784.00 |

|  |  |
| --- | --- |
| Descriptive statistics (Quantitative data): | |
|  |  |
| Statistic | average of historical means |
| No. of observations | 155 |
| Minimum | 329.000 |
| Maximum | 853.200 |
| 1st Quartile | 412.400 |
| Median | 496.222 |
| 3rd Quartile | 671.750 |
| Mean | 534.786 |
| Variance (n-1) | 19698.131 |
| Standard deviation (n-1) | 140.350 |

Box plot

Scattergram

Strip plots

|  |  |
| --- | --- |
| Stem-and-leaf plot (average of historical means): | |
|  |  |
| Unit: | 100 |
|  |  |
| 3 | 3 4 4 5 5 6 6 6 6 6 7 7 7 7 7 8 8 8 8 9 9 9 9 9 0 0 0 0 0 0 0 |
| 4 | 0 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 3 3 3 3 3 4 4 4 5 5 5 5 5 6 6 6 6 6 6 7 8 8 8 8 9 9 9 0 0 0 |
| 5 | 0 0 0 1 1 1 1 1 1 2 2 3 4 4 4 5 7 7 8 |
| 6 | 0 1 1 2 3 3 3 4 4 4 5 5 6 6 7 7 7 7 7 8 8 8 9 9 9 0 |
| 7 | 0 0 0 0 1 1 1 1 2 2 3 3 3 3 3 4 4 4 4 4 5 5 5 6 6 7 9 |
| 8 | 1 4 5 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |

P-P plots

Q-Q Plots

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Summary statistics: | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Variable | Observations | Obs. with missing data | Obs. without missing data | Minimum | Maximum | Mean | Std. deviation |  |
| Average of historical means | 155 | 2 | 153 | 329.000 | 853.000 | 534.804 | 140.369 |  |

Average distribution is not normal (bimodal) and has 2 maximums.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Descriptive statistics for the intervals : | | | |  |
|  |  |  |  |  |
| Lower bound | Upper bound | Frequency | Relative frequency | Density |
| 300 | 310 | 0 | 0.000 | 0.000 |
| 310 | 320 | 0 | 0.000 | 0.000 |
| 320 | 330 | 1 | 0.007 | 0.001 |
| 330 | 340 | 1 | 0.007 | 0.001 |
| 340 | 350 | 2 | 0.013 | 0.001 |
| 350 | 360 | 4 | 0.026 | 0.003 |
| 360 | 370 | 6 | 0.039 | 0.004 |
| 370 | 380 | 4 | 0.026 | 0.003 |
| 380 | 390 | 2 | 0.013 | 0.001 |
| 390 | 400 | 11 | 0.072 | 0.007 |
| 400 | 410 | 5 | 0.033 | 0.003 |
| 410 | 420 | 8 | 0.052 | 0.005 |
| 420 | 430 | 6 | 0.039 | 0.004 |
| 430 | 440 | 5 | 0.033 | 0.003 |
| 440 | 450 | 2 | 0.013 | 0.001 |
| 450 | 460 | 7 | 0.046 | 0.005 |
| 460 | 470 | 3 | 0.020 | 0.002 |
| 470 | 480 | 4 | 0.026 | 0.003 |
| 480 | 490 | 3 | 0.020 | 0.002 |
| 490 | 500 | 4 | 0.026 | 0.003 |
| 500 | 510 | 6 | 0.039 | 0.004 |
| 510 | 520 | 3 | 0.020 | 0.002 |
| 520 | 530 | 2 | 0.013 | 0.001 |
| 530 | 540 | 1 | 0.007 | 0.001 |
| 540 | 550 | 3 | 0.020 | 0.002 |
| 550 | 560 | 1 | 0.007 | 0.001 |
| 560 | 570 | 0 | 0.000 | 0.000 |
| 570 | 580 | 2 | 0.013 | 0.001 |
| 580 | 590 | 1 | 0.007 | 0.001 |
| 590 | 600 | 0 | 0.000 | 0.000 |
| 600 | 610 | 2 | 0.013 | 0.001 |
| 610 | 620 | 2 | 0.013 | 0.001 |
| 620 | 630 | 2 | 0.013 | 0.001 |
| 630 | 640 | 2 | 0.013 | 0.001 |
| 640 | 650 | 2 | 0.013 | 0.001 |
| 650 | 660 | 2 | 0.013 | 0.001 |
| 660 | 670 | 3 | 0.020 | 0.002 |
| 670 | 680 | 4 | 0.026 | 0.003 |
| 680 | 690 | 4 | 0.026 | 0.003 |
| 690 | 700 | 3 | 0.020 | 0.002 |
| 700 | 710 | 6 | 0.039 | 0.004 |
| 710 | 720 | 2 | 0.013 | 0.001 |
| Lower bound | Upper bound | Frequency | Relative frequency | Density |
| 720 | 730 | 5 | 0.033 | 0.003 |
| 730 | 740 | 4 | 0.026 | 0.003 |
| 740 | 750 | 5 | 0.033 | 0.003 |
| 750 | 760 | 1 | 0.007 | 0.001 |
| 760 | 770 | 2 | 0.013 | 0.001 |
| 770 | 780 | 1 | 0.007 | 0.001 |
| 780 | 790 | 0 | 0.000 | 0.000 |
| 790 | 800 | 1 | 0.007 | 0.001 |
| 800 | 810 | 1 | 0.007 | 0.001 |
| 810 | 820 | 0 | 0.000 | 0.000 |
| 820 | 830 | 0 | 0.000 | 0.000 |
| 830 | 840 | 1 | 0.007 | 0.001 |
| 840 | 850 | 0 | 0.000 | 0.000 |
| 850 | 860 | 1 | 0.007 | 0.001 |
| 860 | 870 | 0 | 0.000 | 0.000 |

[Annex IV follows]

PRACTICAL EXERCISE OF JAPAN

1. Yearly data (2002-2011) of Flax Stem length in "Example Varieties".

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| note | Example varieties | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | **AVG.** | **STDEV** | AVG. ± σ |
| 1 | Banquise |  |  |  |  | 516 | 293 | 422 | 357 | 290 | 375.6 | 95.3 | 280.3 –  470.9 |
| 3 | Barbara | 461 | 426 | 469 | 416 | 439 | 439 | 452 | 347 | 321 | 418.9 | 51.2 | 367.7 –  470.1 |
| 5 | Bilton |  | 595 | 564 | 449 | 625 | 360 | 543 | 526 | 381 | 505.4 | 98.1 | 407.2 –  603.5 |
| 7 | Escalina | 953 | 803 | 742 | 675 | 805 | 665 | 798 | 760 | 551 | 750.2 | 112.9 | 637.3 –  863.1 |
| 9 | Dakkar | 1104 | 959 | 937 | 836 | 907 | 736 | 886 | 717 | 662 | 860.4 | 138.6 | 721.8 –  999.1 |

2. Ajusted Fundamental Assessment Table for 2012 of Flax: Stem: length from cotyledon scar to top boll

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Characte-ristics | d. p. | Note | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 21 | Stem: length from cotyledon scar to top boll | 1 | Range |  | 234.6 | 307.7 | 380.8 | 453.9 | 527.0 | 600.1 | 673.2 | 746.3 |
| ～ | ～ | ～ | ～ | ～ | ～ | ～ | ～ | ～ |
|  |  | 234.5 | 307.6 | 380.7 | 453.8 | 526.9 | 600.0 | 673.1 | 746.2 |  |
|  |  | Distance |  | 73.1 | 73.1 | 73.1 | 73.1 | 73.1 | 73.1 | 73.1 |  |
|  |  | Median |  | 271.1 | 344.2 | 417.3 | 490.4 | 563.5 | 636.6 | 709.7 |  |
|  |  | Example variety | Banquise |  | Barbara |  | Bilton |  | Escalina |  | Dakkar |
|  |  | Remarks |  | Banquise:288 |  | Barbara:425 Bilton:423 |  |  | Escalina:673 |  | Dakkar:761 |

3. Evaluation of 2012 data based on FAT

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Variety | 2012 | Note |  | Variety | 2012 | Note |  | Variety | 2012 | Note | | 14 | 333 | 3 |  | 160 | 354 | 3 |  | 30 | 360 | 3 | | 169 | 301 | 2 |  | **79** | **312** | **3** |  | 103 | 408 | 4 | | 168 | 288 | 2 |  | 286 | 358 | 3 |  | 73 | 424 | 4 | | 45 | 403 | 4 |  | 178 | 379 | 3 |  | 281 | 388 | 4 | | 184 | 339 | 3 |  | 203 | 385 | 4 |  | 224 | 377 | 3 | | 83 | 309 | 3 |  | 182 | 329 | 3 |  | 151 | 415 | 4 | | 128 | 334 | 3 |  | 24 | 425 | 4 |  | 195 | 336 | 3 | | 44 | 422 | 4 |  | 149 | 335 | 3 |  | 26 | 467 | 5 | | 166 | 352 | 3 |  | 82 | 309 | 3 |  | 85 | 416 | 4 | | 173 | 349 | 3 |  | 197 | 354 | 3 |  | 56 | 328 | 3 | | 202 | 382 | 4 |  | 219 | 402 | 4 |  | 152 | 384 | 4 | | 40 | 406 | 4 |  | 144 | 407 | 4 |  | 88 | 420 | 4 | | 124 | 412 | 4 |  | 247 | 378 | 3 |  | 226 | 366 | 3 | | | | | | | | | | | |
|  | | | | | | | | | | |
| Variety | 2012 | Note |  | Variety | 2012 | Note |  | Variety | 2012 | Note |
| 30 | 360 | 3 |  | 285 | 454 | 5 |  | 142 | 714 | 8 |
| 103 | 408 | 4 |  | 109 | 498 | 5 |  | 211 | 624 | 7 |
| 73 | 424 | 4 |  | 63 | 400 | 4 |  | 158 | 629 | 7 |
| 281 | 388 | 4 |  | 189 | 466 | 5 |  | 99 | 719 | 8 |
| 224 | 377 | 3 |  | **146** | **423** | **4** |  | 237 | 690 | 8 |
| 151 | 415 | 4 |  | 252 | 447 | 4 |  | 12 | 662 | 7 |
| 195 | 336 | 3 |  | 172 | 407 | 4 |  | 210 | 628 | 7 |
| 26 | 467 | 5 |  | 114 | 415 | 4 |  | 207 | 638 | 7 |
| 85 | 416 | 4 |  | 213 | 459 | 5 |  | 268 | 662 | 7 |
| 56 | 328 | 3 |  | 143 | 479 | 5 |  | 225 | 721 | 8 |
| 152 | 384 | 4 |  | 121 | 494 | 5 |  | 165 | 657 | 7 |
| 88 | 420 | 4 |  | 132 | 406 | 4 |  | 170 | 692 | 8 |
| 226 | 366 | 3 |  | 179 | 540 | 6 |  | 71 | 697 | 8 |
| 250 | 404 | 4 |  | 147 | 405 | 4 |  | 215 | 702 | 8 |
| 154 | 426 | 4 |  | 214 | 434 | 4 |  | **140** | **728** | **8** |
| 280 | 413 | 4 |  | 159 | 535 | 6 |  | 175 | 692 | 8 |
| 201 | 362 | 3 |  | 90 | 456 | 5 |  | 1 | 645 | 7 |
| 87 | 435 | 4 |  | 167 | 491 | 5 |  | 39 | 674 | 8 |
| 196 | 394 | 4 |  | 33 | 423 | 4 |  | 35 | 673 | 7 |
| 248 | 417 | 4 |  | 190 | 488 | 5 |  | 205 | 684 | 8 |
| **76** | **420** | **4** |  | **164** | **492** | **5** |  | 260 | 694 | 8 |
| 251 | 364 | 3 |  | 70 | 540 | 6 |  | 38 | 720 | 8 |
| 183 | 418 | 4 |  | 279 | 537 | 6 |  | 98 | 706 | 8 |
| 177 | 407 | 4 |  | 42 | 572 | 6 |  | 216 | 723 | 8 |
| 80 | 436 | 4 |  | 200 | 604 | 7 |  | 148 | 686 | 8 |
| 174 | 372 | 3 |  | 229 | 645 | 7 |  | 21 | 734 | 8 |
| 231 | 380 | 3 |  | 208 | 605 | 7 |  | 102 | 707 | 8 |
| 153 | 361 | 3 |  | **77** | **626** | **7** |  | 180 | 713 | 8 |
| 239 | 411 | 4 |  | 227 | 639 | 7 |  | **96** | **741** | **8** |
| 212 | 382 | 4 |  | 157 | 616 | 7 |  | 181 | 719 | 8 |
| 84 | 397 | 4 |  | 282 | 672 | 7 |  | 20 | 734 | 8 |
| 238 | 440 | 4 |  | 49 | 634 | 7 |  | 28 | 748 | 9 |
| 113 | 435 | 4 |  | 188 | 649 | 7 |  | 222 | 775 | 9 |
| 163 | 421 | 4 |  | 156 | 638 | 7 |  | 221 | 780 | 9 |
| 243 | 409 | 4 |  | 244 | 629 | 7 |  | 257 | 734 | 8 |
| 230 | 405 | 4 |  | 253 | 663 | 7 |  | 52 | 721 | 8 |
| 249 | 392 | 4 |  | **36** | **633** | **7** |  | 97 | 761 | 9 |
| 136 | 396 | 4 |  | 130 | 639 | 7 |  | 262 | 301 | 2 |
| 61 | 350 | 3 |  | 185 | 695 | 8 |  | 263 | 353 | 3 |
| 78 | 460 | 5 |  | 241 | 725 | 8 |  | 287 | 349 | 3 |
| 115 | 410 | 4 |  | 206 | 626 | 7 |  | 284 | 357 | 3 |
| 278 | 438 | 4 |  | 150 | 680 | 8 |  | 283 | 381 | 4 |
| 131 | 450 | 4 |  | 209 | 667 | 7 |  | 288 | 422 | 4 |
| 204 | 441 | 4 |  | 258 | 651 | 7 |  | 290 | 433 | 4 |
| 17 | 461 | 5 |  | 217 | 713 | 8 |  | 289 | 434 | 4 |

|  |  |  |
| --- | --- | --- |
| Variety | 2012 | Note |
| 303 | 449 | 4 |
| 275 | 469 | 5 |
| 269 | 467 | 5 |
| 297 | 463 | 5 |
| 302 | 468 | 5 |
| 277 | 456 | 5 |
| 274 | 481 | 5 |
| 228 | 624 | 7 |
| 270 | 616 | 7 |
| 293 | 650 | 7 |
| 267 | 642 | 7 |
| 295 | 677 | 8 |
| 273 | 716 | 8 |
| 292 | 685 | 8 |
| 300 | 700 | 8 |
| 291 | 704 | 8 |
| 272 | 726 | 8 |
| 294 | 707 | 8 |
| 299 | 713 | 8 |
| 298 | 751 | 9 |
| 296 | 783 | 9 |
| 301 | 784 | 9 |

[Annex V follows]

PRACTICAL EXERCISE OF THE UNITED KINGDOM

Flax Characteristic: Stem: length from cotyledon scar to top boll

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise%20(3).xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
|
|
| 14 | 470 | 350 | 347 | 339 | 397 | 368 | 338 | 338 | 272 | 333 | 355 |
| 169 |  |  |  |  | 488 | 324 | 384 | 387 | 240 | 301 | 383 |
| 168 |  |  |  |  | 516 | 293 | 422 | 357 | 290 | 288 | 390 |
| 45 | 470 | 390 | 375 | 354 | 458 |  | 427 | 362 | 318 | 403 | 390.6 |
| 184 |  |  |  |  |  | 351 | 407 | 342 | 276 | 339 | 392 |
| 83 | 545 | 402 | 403 | 350 | 472 | 342 | 444 | 397 | 303 | 309 | 396.6 |
| 128 | 548 | 415 | 418 | 338 | 516 | 328 | 449 | 372 | 274 | 334 | 399.1 |
| 44 | 443 |  | 454 |  | 422 |  |  |  | 288 | 422 | 399.2 |
| 166 |  |  |  | 380 | 465 | 330 | 465 | 263 | 356 | 352 | 404.8 |
| 173 |  |  |  |  | 485 | 422 | 423 | 325 | 264 | 349 | 407 |
| 202 |  |  |  |  |  |  | 447 | 351 | 245 | 382 | 407.6 |
| 40 | 476 | 397 | 424 | 381 | 449 | 419 | 385 | 395 | 350 | 406 | 408.2 |
| 124 | 462 |  |  |  |  | 484 | 362 | 383 | 273 | 412 | 410 |
| 160 |  |  |  | 352 | 439 | 375 | 391 | 408 | 345 | 354 | 412.1 |
| **79** | **534** | **391** | **399** | **379** | **483** | **448** | **437** | **385** | **356** | **312** | **412.4** |
| 286 |  |  |  |  |  |  |  |  |  | 358 | 414.1 |
| 178 |  |  |  |  |  | 383 | 429 | 368 | 277 | 379 | 416.2 |
| 203 |  |  |  |  |  |  | 415 | 367 | 295 | 385 | 416.7 |
| 182 |  |  |  |  |  | 446 | 375 | 375 | 317 | 329 | 417.4 |
| 24 | 461 | 426 | 469 | 416 | 439 | 439 | 452 | 347 | 321 | 425 | 419.3 |
| 149 |  |  | 387 |  | 435 | 429 | 455 | 364 | 384 | 335 | 421.1 |
| 82 | 636 | 444 | 459 | 400 | 558 | 343 | 451 | 368 | 263 | 309 | 422.9 |
| 197 |  |  |  |  |  |  | 429 | 487 | 233 | 354 | 426.7 |
| 219 |  |  |  |  |  |  | 430 | 365 | 310 | 402 | 427.8 |
| 144 |  | 455 | 439 |  |  |  | 443 |  |  | 407 | 428.9 |
| 247 |  |  |  |  |  |  |  | 413 |  | 378 | 430 |
| 30 | 632 | 441 | 427 | 384 | 518 | 360 | 424 | 461 | 299 | 360 | 430.4 |
| 103 | 574 | 460 |  |  |  |  |  |  | 286 | 408 | 434.1 |
| 73 | 500 |  |  |  |  |  |  | 407 | 339 | 424 | 434.5 |
| 281 |  |  |  |  |  |  |  |  | 270 | 388 | 436.5 |
| 224 |  |  |  |  |  |  | 414 | 445 | 307 | 377 | 436.8 |
| 151 |  |  | 494 | 420 | 481 | 348 | 431 | 404 | 315 | 415 | 439.1 |
| 195 |  |  |  |  |  | 407 | 439 | 414 | 356 | 336 | 439.4 |
| 26 | 519 |  |  |  |  |  |  |  |  | 467 | 440.4 |
| 85 | 541 | 457 | 458 | 403 | 502 | 439 | 449 | 388 | 356 | 416 | 440.8 |
| 56 |  |  |  |  |  |  |  |  | 344 | 328 | 443.3 |
| 152 |  |  | 411 | 363 | 562 | 430 | 496 | 349 | 355 | 384 | 444.5 |
| 88 | 515 |  |  |  |  |  |  |  | 344 | 420 | 444.5 |
| 226 |  |  |  |  |  |  |  | 399 | 340 | 366 | 444.6 |
| 250 |  |  |  |  |  |  |  | 428 |  | 404 | 450.8 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise%20(3).xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
|
|
| 154 |  |  | 411 | 405 |  | 408 | 469 | 486 |  | 426 | 453.7 |
| 280 |  |  |  |  |  |  |  |  | 285 | 413 | 456.6 |
| 201 |  |  |  |  |  |  | 456 | 519 | 287 | 362 | 457.2 |
| 87 | 564 | 445 | 443 | 438 | 542 | 449 | 522 | 462 | 340 | 435 | 463.7 |
| 196 |  |  |  |  |  |  | 483 | 436 | 347 | 394 | 466.3 |
| 248 |  |  |  |  |  |  |  | 404 | 359 | 417 | 469.2 |
| **76** | **615** |  |  |  |  | **491** | **426** | **461** | **317** | **420** | **469.3** |
| 251 |  |  |  |  |  |  |  | 457 | 359 | 364 | 469.3 |
| 183 |  |  |  |  |  | 462 | 441 | 368 | 412 | 418 | 469.4 |
| 177 |  |  |  |  |  |  |  |  | 318 | 407 | 470 |
| 80 | 589 |  |  |  |  |  |  |  | 341 | 436 | 473.3 |
| 174 |  |  |  |  | 527 | 484 | 473 | 455 | 360 | 372 | 474.1 |
| 231 |  |  |  |  |  |  |  | 425 | 393 | 380 | 475.3 |
| 153 |  |  | 433 | 424 | 565 | 480 | 515 | 471 | 354 | 361 | 476 |
| 239 |  |  |  |  |  |  |  | 434 | 358 | 411 | 477.3 |
| 212 |  |  |  |  |  |  | 441 | 474 | 411 | 382 | 478.2 |
| 84 | 610 | 534 | 486 | 443 | 539 | 492 | 491 | 423 | 397 | 397 | 481.1 |
| 238 |  |  |  |  |  |  |  | 465 | 318 | 440 | 483.5 |
| 113 | 649 |  |  | 434 |  |  |  |  | 318 | 435 | 484.4 |
| 163 |  |  |  | 414 | 574 | 488 | 469 | 453 | 352 | 421 | 484.5 |
| 243 |  |  |  |  |  |  |  | 516 | 304 | 409 | 485.4 |
| 230 |  |  |  |  |  |  |  | 399 | 430 | 405 | 487.5 |
| 249 |  |  |  |  |  |  |  | 479 | 388 | 392 | 495.5 |
| 136 | 604 | 537 | 522 | 436 | 570 | 496 | 540 | 498 | 362 | 396 | 495.9 |
| 61 | 713 |  |  | 437 |  | 523 | 491 | 497 | 338 | 350 | 497.1 |
| 78 | 653 | 575 | 547 | 408 | 555 |  |  |  | 314 | 460 | 497.2 |
| 115 | 721 | 525 | 496 | 438 | 607 | 409 | 526 | 514 | 344 | 410 | 498.8 |
| 278 |  |  |  |  |  |  |  |  | 345 | 438 | 498.9 |
| 131 | 654 | 515 | 496 | 455 | 622 | 476 | 528 | 512 | 344 | 450 | 505.1 |
| 204 |  |  |  |  |  |  | 553 | 496 | 338 | 441 | 508.2 |
| 17 | 652 | 575 | 557 | 455 | 541 |  |  |  |  | 461 | 508.4 |
| 285 |  |  |  |  |  |  |  |  |  | 454 | 510 |
| 109 | 621 | 556 | 482 |  |  |  | 511 | 457 | 464 | 498 | 510.1 |
| 63 | 597 | 549 | 507 | 468 | 585 | 526 | 565 | 494 | 429 | 400 | 511.8 |
| 189 |  |  |  |  |  | 496 | 558 | 476 | 324 | 466 | 512.9 |
| **146** |  | **595** | **564** | **449** | **625** | **360** | **543** | **526** | **381** | **423** | **514** |
| 252 |  |  |  |  |  |  |  | 489 | 379 | 447 | 514.4 |
| 172 |  |  |  |  | 553 | 487 | 539 | 553 | 385 | 407 | 516.2 |
| 114 | 737 |  |  |  |  | 542 | 482 | 468 | 386 | 415 | 519.2 |
| 213 |  |  |  |  |  |  | 557 | 468 | 399 | 459 | 521.8 |
| 143 |  | 544 | 586 | 469 | 620 | 376 | 563 | 519 | 402 | 479 | 524.2 |
| 121 | 663 |  |  |  |  |  |  |  | 363 | 494 | 524.7 |
| 132 | 728 | 540 | 524 | 465 | 640 | 517 | 549 | 533 | 346 | 406 | 524.8 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise%20(3).xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
|
|
| 179 |  |  |  |  |  | 462 | 646 | 484 | 259 | 540 | 527.4 |
| 147 |  | 578 | 533 | 487 | 620 | 522 | 508 | 553 | 382 | 405 | 527.5 |
| 214 |  |  |  |  |  |  | 569 | 519 | 386 | 434 | 528.2 |
| 159 |  |  |  | 436 | 580 |  |  |  | 399 | 535 | 535.3 |
| 90 | 764 | 564 | 495 | 460 | 640 | 528 | 554 | 579 | 393 | 456 | 543.1 |
| 167 |  |  |  | 493 | 621 |  |  |  |  | 491 | 545.7 |
| 33 | 737 | 612 | 549 | 461 | 654 | 626 | 581 | 479 | 376 | 423 | 549.7 |
| 190 |  |  |  |  |  | 507 | 552 | 558 | 416 | 488 | 553.1 |
| **164** |  |  |  | **491** | **611** | **475** | **572** | **571** | **449** | **492** | **554.5** |
| 70 | 752 |  |  |  |  |  |  | 506 | 365 | 540 | 557.3 |
| 279 |  |  |  |  |  |  |  |  | 389 | 537 | 570.3 |
| 42 | 712 | 748 | 612 | 590 | 709 | 565 | 699 | 560 |  | 572 | 623 |
| 200 |  |  |  |  |  |  | 685 | 623 | 410 | 604 | 632 |
| 229 |  |  |  |  |  |  |  | 601 | 471 | 645 | 648.3 |
| 208 |  |  |  |  |  |  | 726 | 719 | 378 | 605 | 658.2 |
| **77** | **875** |  | **697** | **611** | **795** | **580** | **714** | **675** | **399** | **626** | **668.7** |
| 227 |  |  |  |  |  |  |  | 702 | 472 | 639 | 680.5 |
| 157 |  |  | 712 | 683 | 725 | 665 | 733 | 691 | 415 | 616 | 680.6 |
| 282 |  |  |  |  |  |  |  |  | 475 | 672 | 680.7 |
| 49 | 874 | 769 | 712 | 630 | 746 | 558 | 739 | 661 | 493 | 634 | 681.6 |
| 188 |  |  |  |  |  | 646 | 719 | 675 | 485 | 649 | 683.8 |
| 156 |  |  | 714 | 684 | 766 | 692 | 749 | 712 | 391 | 638 | 694 |
| 244 |  |  |  |  |  |  |  | 699 | 527 | 629 | 694.4 |
| 253 |  |  |  |  |  |  |  | 729 | 486 | 663 | 702.2 |
| **36** | **926** | **783** | **726** | **643** | **775** | **621** | **743** | **662** | **518** | **633** | **702.8** |
| 130 | 902 | 770 | 723 | 675 | 782 | 660 | 779 | 665 | 509 | 639 | 710.3 |
| 185 |  |  |  |  |  | 621 | 752 | 752 | 491 | 695 | 711.2 |
| 241 |  |  |  |  |  |  |  | 692 | 503 | 725 | 716.1 |
| 206 |  |  |  |  |  |  | 712 | 714 | 629 | 626 | 721.7 |
| 150 |  |  | 733 | 682 | 824 | 668 | 781 | 729 | 471 | 680 | 721.8 |
| 209 |  |  |  |  |  |  | 727 | 771 | 518 | 667 | 722 |
| 258 |  |  |  |  |  |  |  |  | 578 | 651 | 722 |
| 217 |  |  |  |  |  |  | 709 | 733 | 532 | 713 | 723.1 |
| 142 |  | 811 | 769 | 666 | 804 | 641 | 715 | 750 | 481 | 714 | 723.4 |
| 211 |  |  |  |  |  |  | 763 | 743 | 567 | 624 | 725.6 |
| 158 |  |  | 774 | 694 | 771 | 662 | 750 | 805 | 533 | 629 | 727.9 |
| 99 | 955 | 814 | 760 | 647 | 791 | 664 | 746 | 714 | 476 | 719 | 728.3 |
| 237 |  |  |  |  |  |  |  | 754 | 520 | 690 | 730.9 |
| 12 | 916 | 827 | 736 | 659 | 788 | 722 | 750 | 729 | 531 | 662 | 731.9 |
| 210 |  |  |  |  |  |  | 737 | 765 | 595 | 628 | 732.3 |
| 207 |  |  |  |  |  |  | 804 | 730 | 555 | 638 | 732.6 |
| 268 |  |  |  |  |  |  |  |  | 590 | 662 | 733.1 |
| 225 |  |  |  |  |  |  | 701 | 737 |  | 721 | 735.1 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise%20(3).xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
|
|
| 165 |  |  |  | 713 | 813 | 675 | 820 | 752 | 497 | 657 | 735.3 |
| 170 |  |  |  |  | 799 | 680 | 813 | 712 | 542 | 692 | 735.3 |
| 71 | 960 | 784 | 753 | 691 | 792 | 674 | 812 | 744 | 462 | 697 | 736.7 |
| 215 |  |  |  |  |  |  | 792 | 751 | 508 | 702 | 739.4 |
| **140** |  | **814** | **739** |  | **801** | **680** | **814** | **703** | **535** | **728** | **740.7** |
| 175 |  |  |  |  | 805 | 642 | 806 | 758 | 570 | 692 | 741.1 |
| 1 | 942 | 803 | 782 | 717 | 781 | 664 | 773 | 749 | 564 | 645 | 741.7 |
| 39 | 922 | 820 | 804 | 690 | 797 | 666 | 745 | 756 | 545 | 674 | 741.7 |
| 35 | 953 | 803 | 742 | 675 | 805 | 665 | 798 | 760 | 551 | 673 | 742.4 |
| 205 |  |  |  |  |  |  | 776 | 801 | 508 | 684 | 743.5 |
| 260 |  |  |  |  |  |  |  |  | 584 | 694 | 746.5 |
| 38 | 979 |  |  |  |  | 719 | 769 | 691 | 520 | 720 | 746.9 |
| 98 | 946 | 817 | 741 | 691 | 804 | 697 | 787 | 733 | 569 | 706 | 749 |
| 216 |  |  |  |  |  |  | 801 | 730 | 553 | 723 | 753 |
| 148 |  |  | 802 | 699 | 854 | 675 | 771 | 869 | 542 | 686 | 762.6 |
| 21 | 995 | 827 | 800 | 744 | 826 | 687 | 856 | 726 | 438 | 734 | 763 |
| 102 | 975 | 828 | 820 | 739 | 822 | 723 | 821 | 685 | 521 | 707 | 764 |
| 180 |  |  |  |  |  | 715 | 843 | 745 | 599 | 713 | 772 |
| **96** | **1006** | **809** | **795** | **702** | **838** | **704** | **827** | **765** | **540** | **741** | **772.3** |
| 181 |  |  |  |  |  | 716 | 817 | 809 | 566 | 719 | 774.4 |
| 20 | 975 |  | 801 |  |  |  | 726 | 807 |  | 734 | 782.5 |
| 28 | 1044 | 848 | 865 | 753 | 836 | 718 | 766 | 803 | 522 | 748 | 790.2 |
| 222 |  |  |  |  |  |  | 811 | 839 | 564 | 775 | 798.2 |
| 221 |  |  |  |  |  |  | 819 | 812 | 591 | 780 | 801.7 |
| 257 |  |  |  |  |  |  |  |  | 655 | 734 | 801.9 |
| 52 | 1024 | 895 |  |  |  |  | 719 | 829 |  | 721 | 805.7 |
| 97 | 1104 | 959 | 937 | 863 | 907 | 736 | 886 | 717 | 662 | 761 | 853.1 |
| 262 |  |  |  |  |  |  |  |  | 247 | 301 | 381.7 |
| 263 |  |  |  |  |  |  |  |  | 234 | 353 | 400.7 |
| 287 |  |  |  |  |  |  |  |  |  | 349 | 405.7 |
| 284 |  |  |  |  |  |  |  |  |  | 357 | 413.4 |
| 283 |  |  |  |  |  |  |  |  |  | 381 | 437.1 |
| 288 |  |  |  |  |  |  |  |  |  | 422 | 478.1 |
| 290 |  |  |  |  |  |  |  |  |  | 433 | 489 |
| 289 |  |  |  |  |  |  |  |  |  | 434 | 490.4 |
| 303 |  |  |  |  |  |  |  |  |  | 449 | 505.6 |
| 275 |  |  |  |  |  |  |  |  | 341 | 469 | 512.2 |
| 269 |  |  |  |  |  |  |  |  | 351 | 467 | 516.2 |
| 297 |  |  |  |  |  |  |  |  |  | 463 | 518.8 |
| 302 |  |  |  |  |  |  |  |  |  | 468 | 524.6 |
| 277 |  |  |  |  |  |  |  |  | 417 | 456 | 544.1 |
| 274 |  |  |  |  |  |  |  |  | 405 | 481 | 550.2 |
| 228 |  |  |  |  |  |  |  | 671 | 467 | 624 | 663.5 |
| [Variety[1]](file:///D:\Users\koide\AppData\Local\Microsoft\Windows\Temporary%20Internet%20Files\Content.Outlook\A6NU3T7E\practical%20exercise%20(3).xlsx#RANGE!A190) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2009 | 2010 | 2011 | 2012 | Over-year mean |
|
|
| 270 |  |  |  |  |  |  |  |  | 557 | 616 | 693.8 |
| 293 |  |  |  |  |  |  |  |  |  | 650 | 706.6 |
| 267 |  |  |  |  |  |  |  |  | 591 | 642 | 723.8 |
| 295 |  |  |  |  |  |  |  |  |  | 677 | 733.3 |
| 273 |  |  |  |  |  |  |  |  | 549 | 716 | 739.9 |
| 292 |  |  |  |  |  |  |  |  |  | 685 | 741.3 |
| 300 |  |  |  |  |  |  |  |  |  | 700 | 756.6 |
| 291 |  |  |  |  |  |  |  |  |  | 704 | 760.5 |
| 272 |  |  |  |  |  |  |  |  | 580 | 726 | 760.6 |
| 294 |  |  |  |  |  |  |  |  |  | 707 | 763.7 |
| 299 |  |  |  |  |  |  |  |  |  | 713 | 769.2 |
| 298 |  |  |  |  |  |  |  |  |  | 751 | 807.5 |
| 296 |  |  |  |  |  |  |  |  |  | 783 | 839 |
| 301 |  |  |  |  |  |  |  |  |  | 784 | 840.3 |

[1] bold font: delineating variety

[2] Ref’: reference varieties / Cand’: candidate varieties

[End of Annexes and of document]