E

TWC/29/21
ORIGINAL: English
DATE: May 24, 2011

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS

Twenty-Ninth Session
Geneva, June 7 to 10, 2011

THE USE OF IMAGE TOOL IN MEASUREMENTS OF GRAIN LENGTH OF RYE (SECALE CEREALE L.)

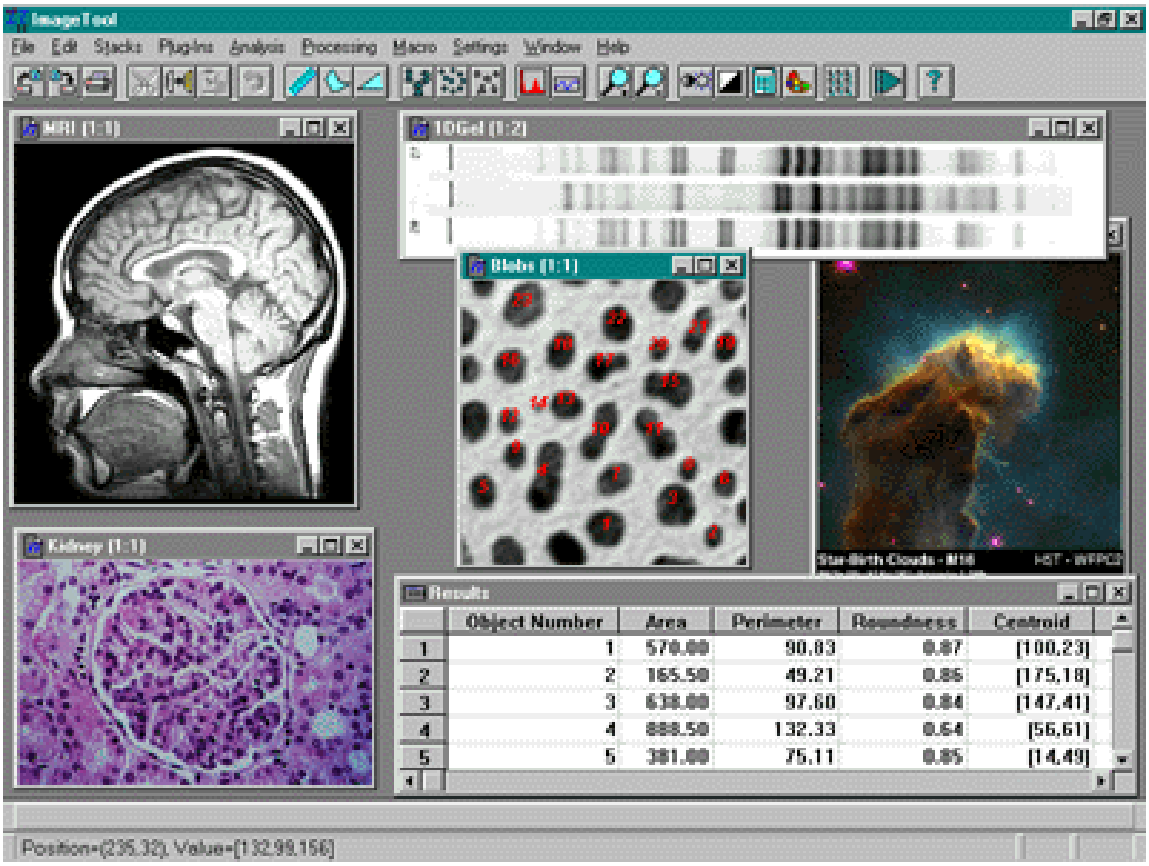
Document prepared by experts from Finland

The use of Image Tool in measurements of grain length of Rye (*Secale cereale* L.)

TWC 29 Geneva
Sami Markkanen
Finnish Food Safety Authority Evira

1
Sami Markkanen/TWC 29

Evira

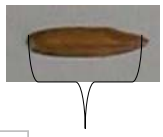


- IT is developed in the Department of Dental Diagnostic Science at The University of Texas
- Image Tool can acquire, display, edit, analyze, process, compress, save and print gray scale and color images.
- Functions: distance, angle, perimeter, area
- Spatial calibration to provide real world dimensional measurements

Evira

The use of IT in the grain length measurements

Rye, Secale cereale
UPOV TG/58/6 , CPVO-TP/58/1
Character 20: Grain: length



mm

				Rye/Seigle/Roggen/Centeno, 99-03-24							
-12-					-12-						
Stage 1)										Example Varieties	
Stade 1)										Exemples	Note/
Stadium 1)		English		français		deutsch		español		Beispielss	Nota
Estado 1)										Variedades ejemplo	
20.	92	**Grain: length**		Grain: longueur		Korn: Länge		Grano: longitud			
(*)	M										
(+)		very short		très court		sehr kurz		muy corto			**1**
		short		court		kurz		corto		Uso	**3**
		medium		moyen		mittel		medio		Esprit; Sor	**5**
		long		long		lang		largo			**7**
		very long		très long		sehr lang		muy largo			**9**

Evira

Step 1. Collecting the material

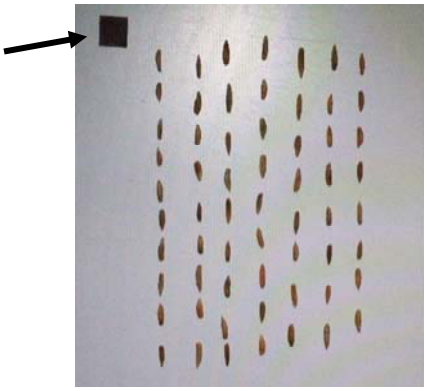
…the length should be assessed by taking one harvested bunch each from the row plots (60 grains)

5
Sami Markkanen/TWC 29

Evira

Step 2. Taking a photograph

Scale
(10 mm)

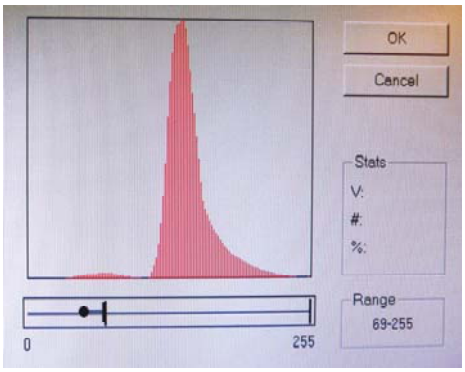


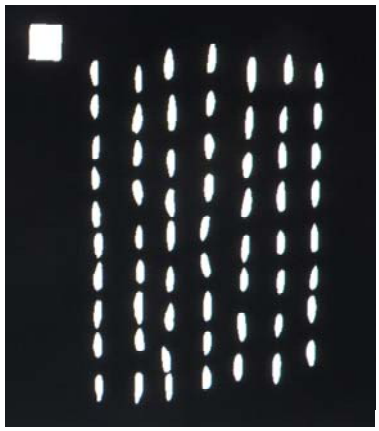
Change from color to gray scale

6
Sami Markkanen/TWC 29

Evira

Step 3. Threshold setting





Produces a binary image

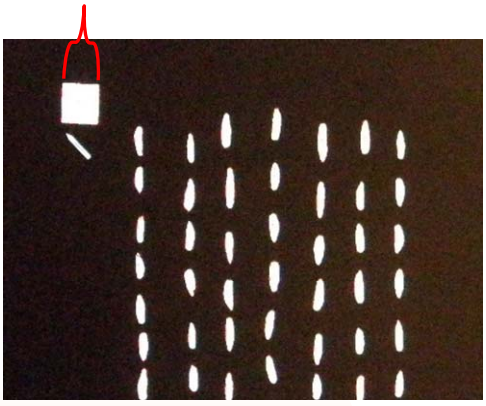
7
Sami Markkanen/TWC 29

Evira

Step 4: Calibrate spatial measurements: draw a line on known length

How long is the line?

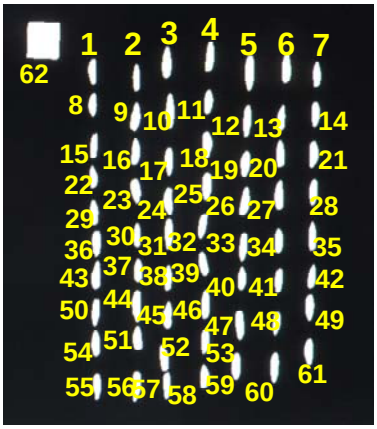
10 mm



8
Sami Markkanen/TWC 29

Evira

Step 5. Analysis



Object Analysis: Find Objects

There are 62 objects in the image

Object Analysis: Analyze

Evira

Step 6: Results

	Object	Area	Perimeter	**Major Axis Length**	Major Axis Angle	Minor Axis Length	Minor Axis	Elongation	Roundness
Mean		15,74	19,46	**8,1**	22,9	2,36	-0,28	3,68	0,5
Std. Dev.		12,62	3,69	**1,24**	82,59	1,53	7,6	0,62	0,06
	#1	17,1	21,47	**9,33**	85,03	2,13	-5,44	4,38	0,47
	#2	12,8	18,7	**7,98**	89,27	1,92	0	4,16	0,46
	#3	13,24	18,47	**8,19**	87,88	1,92	-3,01	4,26	0,49
	#4	13,97	18,94	**7,27**	-89,2	2,42	0	3	0,49
	#5	17,28	21,41	**9,41**	86,92	2,33	-2,49	4,05	0,47
	#6	17,26	19,59	**8,2**	86,47	2,63	-4,4	3,11	0,57
	#7	14,21	19,37	**8,22**	-79,38	2,16	10,78	3,81	0,48
	#8	14,7	18,54	**7,79**	-86,28	2,33	2,49	3,35	0,54
	#9	14,05	18,64	**7,42**	-83,75	2,44	7,13	3,04	0,51
	#10	12,34	17,55	**7,42**	83,75	2,03	-5,71	3,65	0,5
	#11	13,69	18,56	**6,84**	-81,51	2,56	9,09	2,68	0,5
	#12	16,35	20,49	**8,72**	-85,35	2,23	5,19	3,91	0,49
	#13	10,33	15,83	**7,02**	83,39	1,93	-6,01	3,64	0,52
	#14	15,26	19,63	**8,1**	85,71	2,33	-4,97	3,47	0,5
	#15	13,24	19,53	**8,3**	85,82	2,02	-2,86	4,11	0,44
	#16	18,01	23,02	**10,01**	92,31	2,12	2,73	4,71	0,43
	#17	14,35	18,05	**7,79**	-87,03	2,22	2,6	3,5	0,55
	#18	16,3	20,89	**8,99**	88,71	2,22	0	4,05	0,47
	#19	11,84	16,7	**7,33**	82,87	1,83	-6,34	4,01	0,53
	#20	11,55	17,36	**7,58**	87,71	1,82	-3,18	4,16	0,48
	#21	11,62	16,19	**6,97**	-88,34	2,02	2,86	3,45	0,56

Evira

Benefits of using Image Tool

- Measurements are faster and more accurate
- Easy to use
- Free

IT was developed in the Department of Dental Diagnostic Science at The University of Texas Health Science Center, San Antonio, Texas.
The program was developed by C. Donald Wilcox, S. Brent Dove, W. Doss McDavid and David B. Greer.

- Home page of Image Tool: http://ddsdx.uthscsa.edu/dig/itdesc.html

11
Sami Markkanen/TWC 29

Evira

12
Sami Markkanen/TWC 29

Evira

[End of document]