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(*T. aestivum*. L.)

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3. DTPA

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1. Mistcherlich and Bray equation
  2. Plant response column order procedure

The figure consists of a series of mathematical expressions arranged in a grid-like pattern. The columns represent different variables: X, Y, t, and  $\chi^2$ . The rows represent different functions or operations: addition (+), subtraction (-), multiplication ( $\cdot$ ), division ( $/$ ), and square root ( $\sqrt{\phantom{x}}$ ). Each cell contains a term involving a variable and a function of  $\Delta Y_{\max}$ , such as  $(X) \cdot (\Delta Y_{\max})$  or  $(Y) / (\Delta Y_{\max})$ .

	X	Y	t	$\chi^2$
+ (Addition)	$(X) + (\Delta Y_{\max})$	$(Y) + (\Delta Y_{\max})$	$(t) + (\Delta Y_{\max})$	$(\chi^2) + (\Delta Y_{\max})$
- (Subtraction)	$(X) - (\Delta Y_{\max})$	$(Y) - (\Delta Y_{\max})$	$(t) - (\Delta Y_{\max})$	$(\chi^2) - (\Delta Y_{\max})$
$\cdot$ (Multiplication)	$(X) \cdot (\Delta Y_{\max})$	$(Y) \cdot (\Delta Y_{\max})$	$(t) \cdot (\Delta Y_{\max})$	$(\chi^2) \cdot (\Delta Y_{\max})$
$/$ (Division)	$(X) / (\Delta Y_{\max})$	$(Y) / (\Delta Y_{\max})$	$(t) / (\Delta Y_{\max})$	$(\chi^2) / (\Delta Y_{\max})$
$\sqrt{\phantom{x}}$ (Square Root)	$\sqrt{(X) + (\Delta Y_{\max})}$	$\sqrt{(Y) + (\Delta Y_{\max})}$	$\sqrt{(t) + (\Delta Y_{\max})}$	$\sqrt{(\chi^2) + (\Delta Y_{\max})}$

1. Vitavax
  2. Zadok's scale
  3. One way variance analaysis or completely randomized design (CRD)

#### 4. Bartlett's test

## 1. Coefficient of Determination

$(\chi^2)$	$(R^2)$	F	$n_2$	$n_1$	(	$\frac{(\Delta Y_{max})}{( )}$	$\frac{(Y_{max})}{( )}$	$(Y_0)$
/ ns	/ ns	/ ns						
/ ns	/ ns	/ ns						
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 ( . . . . . n<sub>1</sub>)  
 n<sub>1</sub>  
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...	:
$(\chi^2)$	$(R^2)$
$F$	$n_2 \quad n_1$

$$(\Delta Y_{max}) \quad (Y_{max}) \quad (Y_0)$$

/ ns	/ ns	/ ns
/ ns	/ ns	/ *
/ ns	/ **	/ **
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.	** * ns ( :
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$(\chi^2)$	$(R^2)$	$F$	$n_1 \quad n_3 \quad n_2 \quad n_2 \quad n_1 \quad n_3$	( )	$\Delta Y_{max} \quad (Y_{max}) \quad (Y_0)$
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/ ns - / ns	/ ns - / **	/ ns - / **
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( .	$n_1$	$n_1$



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F<sub>max</sub> .( ) .

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/ ( ) /  $\chi^2$  ( / \*)

C ( / ns) F<sub>max</sub> ( / ns)

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1. West Asia and North Africa (WANA)

## REFERENCES

- ( )
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- MSTATC
13. Agrawal, H. P. 1992. Assessing the micronutrient requirement of winter wheat. Commun. Soil Sci. Plant Anal. 23 (17-20): 2255-2568.
  14. Amer, F. M. 1995. Soil test modifiers for coarse - textured calcareous soils. Commun. Soil Sci. Plant Anal. 26 (17/18): 3023-3032.
  15. Bray, R. H. 1944. Soil plant relationships: I. The quantitative relation of exchangeable K to crop response to potash additions. Soil Sci. 58: 305-324.
  16. Bray, R. H. 1958. The correlation of a phosphorus soil test with the response of wheat through a modified Mitscherlihk equation. Soil Sci. Soc. Am. Pro. 22: 314-317.
  17. Cakmak, I., A. Yilmaz, M., Kalayci, H. Ekiz, B. Torun, B. Erenoglu, & H.J. Braun. 1996. Zinc deficiency as a critical problem in wheat production in Central Anatolia. Plant and Soil 180:165-172.
  18. Cate, R. B. Jr., & L. A. Nelson. 1971. A simple statistical procedure for partitioning soil test correlation data into two classes. Soil Sci. Soc. Am. Pro. 35:658-660.
  19. Cate, R. B., Jr., & L. A. Nelson. 1965. A rapid method for correlation of soil test analyses with plant response data. North Carolina Agric.Exp.Stn. International Soil Testing Series, Tech. Bull. No.1.
  20. Dow, A.I., & S. Roberts. 1982. Critical nutrient ranges for crop diagnosis. Agron. J. 74: 401-403.
  21. Dwivedi, B. S., & K.N. Tiwari. 1992. Effect of native and fertilizer zinc on dry matter yield and zinc uptake by wheat (*Triticum aestivum*) in Udic Ustochrepts. Trop. Agric. 69:357-361.
  22. Fageria, N. K., V. C. Baligar, & C. A. Jones. 1991. Growth and mineral nutrition of field crops. Marcel Dekker, Inc.

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- 23.Harmsen, K., K. D. Spepherd, & A. Y. Allan. 1983. Crop response to nitrogen and phosphorus in rainfed agriculture. p. 223-248. In: Nutrient balances and the need for fertilizers in semi-arid and arid regions. proc. 17th Colloquium. Int. Potash Ins., Bern, Switzerland.
- 24.Havlin, J. L., & P. N. Soltanpour. 1982. Greenhouse and field evaluation of the  $\text{NH}_4\text{HCO}_3$ -DTPA soil test for Fe. *J. Plant Nutr.* 5(4-7): 769-783.
- 25.Keisling, T. C., & B. Mullinix. 1979. Statistical considerations for evaluation micronutrient tests. . *Soil Sci. Soc. Am. J.* 43; 1181-1184.
- 26.Krentos, V. D., & P. I. Orphanos. 1979. Nitrogen and phosphorus fertilizers for wheat and barley in a semi-arid region. *J. Agric. Sci: (Camb.)*. 93: 711-717.
- 27.Kumar Das, D. 1997. Introductory Soil Science. Kalyani Publishers, India.
- 28.Marschner, H. 2002. Mineral nutrition of higher plants. Elsevier Science Ltd.
- 29.Matar, A., J. Torrent & J. Ryan .1992. Soil and fertilizer phosphorus and crop responses in the dryland Mediterranean zon. *Soil Sci*: 18:82 –146.
- 30.Matar, A. E., E. Jabbour, & K. El Hajj. 1987. Prediction of barley response to fertilizers by means of soil nitrogen and phosphorus tests. p. 12-22. In: A. Matar, N. Soltanpour, and A. Chouinard (eds.). *Soil Test Calibration in West Asia and North Africa*. Proc. Second Regional Soil Test Calibration Worshop, 1-6 Sept. Turkey. ICARDA, Aleppo, Syria.
- 31.Melsted, S. W, & T .R. Peck. 1973. The principle of soil testing. p. 85-98. In : L. M. Walsh , & J. D. Beaton(eds.). *Soil testing: correlating and interpreting the analytical results*. SAS Special Publication No. 29. Amer. Soc. Agron., Madison, W.I.
- 32.Nelson, L. A., & R. L. Anderson. 1984. Partitioning of soil test crop response probability. p. 19-38. In: T. R. Peck, J. T. Cope, Jr &, D.A. Whitney. *Soil testing and interpreting the analytical results*. Soil Sci. Soc. Amer. Inc.
- 33.Roelfs, A. P., R. P. Singh, E. E. Saari & Hettel, G. P. 1992. Rust diseases of wheat: Concepts and methods of disease management. Mexico, D. F.: CIMMYT.
- 34.SAS Institute. 1985. SAS user's guide: statistics version 5 ed, SAS Inst. Inc. Gary, N.C.
- 35.Sillanpää, M. 1982. Micronutrients and the nutrient status of soils: A global study. FAO Soils Bulletin 48. Food and Agriculture Organization of the United Nations, Rome. pp. 75-82.
- 36.Sims. J. T. & G. V. Johnson. 1991. Micronutrient Soil tests. p. 427-477. In: J. J. Mortvedt, F. R. Cox, L. M. Shuman and R. M. Walch. *Micronutrients in agriculture (second edition)*. Soil Science Society of America, Inc. Madison, Wisconsin, USA.
- 37.Singh, J. P., Karamanos, R. E., & Stewart, J. W. B. 1987. The zinc fertility of Saskatchewan soils. *Can. J. Soil Sci.* 67:103-116.
- 38.Soltanpour, P. N., M. El Gharous, A. Azzaoui, & M. Abdelmonen. 1987. Nitrogen and phosphorus soil-test calibration studies in the Chaouia Region of Morocco. p. 67-81. In: A. Matar, N. Soltanpour, and A. Chouinard (eds.). *Soil Test Calibration in West Asia and North Africa*. Proc. Second Regional Soil Test Calibration Worshop, 1-6 Sept. Turkey. ICARDA, Aleppo, Syria.
- 39.Soltanpour, P. N., M. El Gharous, & A. Azzaoui. 1986. Nitrogen and phosphorus soil test calibration studies in Morocco. p. 85-95. In: Proceeding of First Soil Test Calibration Workshop June 1986. ICARDA, Aleppo, Syria.
- 40.Soltanpour, P.N., A. Matar & K. Harmsen. 1988. Program of work for the regional network of soil test calibration study sites in limited rainfall areas. p. 111-116. In: A. Mara, P. N. Soltanpour and Amy Chouiard (eds.). *Soil test calibration in West Asia and North Africa*. Proc. of the Second Regional Workshop Ankara, Turkey, 1-6 Sept. 1987. ICARDA, Aleppo Syria.
- 41.Tandon, H. 1995. Micronutrients in soils, crops and fertilizers. Fertilizer Development and Consultation Organisation. New Delhi, India.