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Short Communication

Low Biuret Urea Application at Different Phenophases of Bunch to Improve Productivity and Quality of "Perlette" Grapes

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ABSTRACT

Grape cv "Perlette" produces very compact bunchs which leads to develop botrytis bunch at fruit maturity stage. Urea was tested as chemical thinner on grape cv Perlette using five concentrations (1, 1.5, 2, 2.5 & 3%) applied at pre-bloom (PB), Fruit set (FS) and PB + FS stages. Treatment reduced fruit set, occurrence of shot berries and increased rachis length, berry weight and cap-stem length. All the treatments reduced bunch compactness to a variable degree.

Key Words: Urea; Grape; Bunch thinning

INTRODUCTION

The Europeon grapes (*Vitis vinifera* L.) are the most important species of the family vitacae. Euvitis (the true grapes) and Muscadinia are subgenera of genus "vitis". The cultivation of grapes is as old as that of man history. They are native to warm temperate zone and their cultivation is most successful between 34 and 49 north and south latitude. For the best development *Vitis vinifera* requires long warm to hot dry summer and cool rainy winter (Winkler *et al.*, 1974).

In Pakistan, grape cultivation is restricted to Baluchistan and some districts of NWFP. To escape the problem of berry rottening due to monsoon rains, early maturing variety of grapes cv. Perlette was introduced for cultivation in Punjab. The variety with all other merits develops frequently compact bunches which requires thinning (Chaudhary & Malik, 1989).

Bunch thinning is done through cultural treatments (Pruning) or Spray of chemicals at pre-bloom, Peak bloom and fruit set stages. The practice is done to reduce bunch compactness and to improve the productivity and quality of this variety.

The present studies were, therefore, under taken with a view to reduce the bunch compactness in Perlette grapes and for this purpose. Low biuret urea at different concentrations was applied at various phenophases of bunch.

MATERIALS AND METHODS

The studies were carried out in the Experimental Fruit Garden of the Department of Horticulture, University of Agriculture, Faisalabad, during 1998-99. Eighteen vines were selected for experiment. Experiment was laid out in randomized complete block design with 6 treatments and four blocks. Low biuret urea with the concentrations of 0, 1, 1.5, 2, 2.5, and 3% was applied at Prebloom (PB), Fruit set (FS) and PB + FS stages during 1999. The canes were pruned to 6, 8, and 10 number of nodes. The tagged branches were visited daily and data were collected about bud busting, Panicle emergences, flower opening, fruit set dates and their percentage was calculated. Rachis length was measured at fruit maturity. Berry weight and cap-stem length was measured after harvest. Observations regarding percentage of fruit set, percent berry thinning, berry weight, rachis length, cap-stem length were calculated. T.S.S. were also determined using standard method of analyses. For the experiment, data were collected from each treatment unit and the mean of each unit was used for the statistical analysis. Least significant difference (LSD) test at 5% level of probability was used to test the significance of treatment means (Steel & Torrie, 1980).

RESULTS AND DISCUSSION

The data presented in Table I reveal that all the treatments of low biuret urea differed significantly from control in term of fruit set and fruit thinning percentage. The reason may be the interference with fertilization of the ovary of phytotoxicity in the peduncle region (Byers & Lyons, 1985).

The lowest fruit set percentage was recorded with 2.5% urea sprayed at pre-bloom stage and maximum thinning percentage with 3% urea sprayed at prebloom + Fruit Set stage (PB + FS) Our results are in line with the finding of Baratta *et al*. (1992). Who worked on olive with different concentrations of urea and Guirguis *et al.* (1996) reported that urea application at the rate of 1 to 3% reduced fruit set in olive.

Rachis length. Increment in the rachis length was

Table I. Grape cv. Perlette as affected by different concentrations of low biurel urea applied at different stages

Treatments Urea application stage	Urea Concentration %age	Fruit set %age	Berry Thinning %age	Rachis length (cm)	Berry weight (g)	Cap-stem length (cm)	Normal berry %age	Shot berry %age
	0%	62.10 a	9.50 f	20.58 f	1.06 e	0.82 de	74.75 d	25.25 N.S.
	1%	48.22 b	18.90 c	22.70 ce	1.29 d	0.83 de	81.38 bc	18.60
	1.5%	47.5 b	19.05 c	24.10 bc	1.31 d	0.80 a	80.00 bd	20.00
Prebloom	2%	46.8 bc	20.83 de	21.83 ef	1.34 bd	0.97 a	80.88 bc	19.13
	2.5%	44.00 cd	22.33 de	22.38 de	1.36 bd	0.83 de	82.80 ab	17.57
	3%	42.85 d	23.92 d	25.73 a	1.36 bd	0.94 b	79.65 cd	20.68
	0%		9.50 f	20.58 f	1.06 c	0.82 de	74.75 d	25.25 N.S.
	1%		42.25	26.10 a	1.44 a	0.80 de	83.22 ab	16.77
	1.5%		45.53 c	23.65 bd	1.40 ac	0.76 e	80.65 bd	19.27
Fruit set	2%		45.53 c	23.90 bc	1.34 bd	0.84 ce	80.72 bd	19.27
	2.5%		46.32 c	25.00 ab	1.31 d	0.84 ce	77.80 cd	21.95
	3%		48.33 bc	24.88 ab	1.31 d	0.82 de	81.50 ac	18.47
	0%		9.50 f	20.58 f	1.06 e	0.82 de	74.75 d	25.25 N.S.
	1%		51.05 ab	23.95 bc	1.33 cd	0.82 de	81.80 ac	18.20
Prebloom and Fruit set	1.5%		51.33 ab	23.15 ab	1.41 ab	0.92 de	82.20 ab	17.8
	2%		53.70 a	26.15 a	1.35 bd	0.79 de	84.10 a	15.91
	2.5%		53.97 a	26.05	1.44 a	0.81 de	0.81 ab	17.2
	3%		54.25 a	25.15	1.46 a	0.86 bd	0.86 a	14.66

anticipated to reduce bunch compactness by providing more space to the existing number of berries with 2% concentration at PB + FS which resulted in longest rachis of 26.15 cm. Similarly, other concentrations proved equally effective statistically and differed significantly from control.

Berry weight. All the treatments induced significant increase in average berry weight. Berries of comparatively bigger size (1.46 cm berry) developed with 3% urea treated at PB + FS stage. Our results coincide with Makhija *et al*. (1990) who worked on beauty seedless grapes and proved that beery weight would maximized while treating with 250 ppm ethephone.

Cap-stem length. Increase in cap-stem length reduces bunch compactness. Maximum cap-stem length of 0.97 and 0.94 cm is reported with 2 and 3% urea spray at PB stage respectively Bunches treated at PB + FS stages with 1.5% urea resulted with 0.92 cm cap-stem length. All the concentrations were equally effective statistically.

Normal ad shot berries. Perlette cv. produces compact bunches with higher percentage of shot berries which affect the quality. This factor of studies showed non significance difference, however, the application of 3% urea at PB + FS stage gave the least percentage of shot berries i.e. 14.66. All the treatments induced significant decrease in short berries percentage. Spray of ureaat 1.5% on FS stage resulted in 15.91 and 16.77% short berries respectively. The similar results were obtained by Aki *et al*. (1996) who worked on red Roomy grape vine with urea and boric acid. Our work confirmed the results of Akl *et al.* (1996) who work on Red Roomy grapevine with (1 & 1.5%) urea and boric acid (0.1, 0.2, 0.3%). Spraying urea 1% combined with boric acid at 0.2% resulted in decreased short berries.

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