

YIELD AND FRUIT QUALITY RESULTS FROM DEFICIT IRRIGATION STUDY ON NECTARINE 'SEPTEMBER BRIGHT'

Tables 1 – 6 present production results (yield, fruit quality) for nectarine 'September Bright' in response to irrigation treatments under an Open Tatura canopy system for 6 consecutive seasons: 2016/17, 2017/18, 2018/19, 2019/20, 2020/21 and 2021/22, respectively at Tatura, Victoria, Australia.

Table 1. Yield and fruit quality performance statistics in response to deficit irrigation treatments of nectarine 'September Bright' under an Open Tatura canopy system during 2016/17 season.

Treatment	Fruit number (#/tree)	Yield (kg/tree)	Fruit weight (g)	Fruit sweetness (°Brix)	Fruit maturity (LAD)	Fruit firmness (kgf)	Fruit colour (% red)
0_I	115 abcde	12.6 bc	113 b	15.7 c	0.8 bcd	3.9 bc	53 a
0_II	95 ab	12.6 bc	136 d	15.2 ab	0.7 bc	3.9 bc	66 d
0_IIIa	121 bcde	12.9 bc	111 b	15.1 ab	0.7 bc	3.6 ab	60 c
0_IIIb	122 cde	10.0 a	84 a	18.1 e	1.0 f	5.6 d	74 e
20_I	89 a	12.0 abc	135 d	15.5 bc	0.7 ab	3.8 abc	57 bc
20_II	100 abc	13.2 c	135 d	15.1 a	0.6 a	3.2 a	66 d
20_IIIa	127 de	14.2 cd	113 b	15.3 ab	0.7 bc	3.6 ab	59 bc
20_IIIb	117 bcde	10.4 ab	90 a	17.3 d	1.2 g	5.8 d	69 d
40_I	137 e	16.1 d	119 bc	15.4 abc	0.9 ef	4.4 c	52 a
40_II	106 abcd	13.3 c	128 cd	15.3 ab	0.8 cde	4.2 bc	59 bc
40_IIIa	113 abcde	13.8 cd	124 c	15.3 ab	0.9 de	4.1 bc	57 b
Control	113 abcde	14.3 cd	129 cd	15.3 ab	0.9 cde	4.2 bc	57 bc
ANOVA	*	***	***	***	***	***	***

ns, *, ** and *** indicate not determined, non-significant or significant differences at $P < 0.05$, 0.01 or 0.001, respectively, for the two-way interaction irrigation treatments. Significant differences ($P < 0.05$) between irrigation treatments are denoted with different lower-case letters. Treatment values 0, 20 and 40 depict deficit (0, 20, 40% ETc) irrigation treatments and the period of fruit growth when deficit regime was applied (Stage I, III, IIIa, IIIb) compared to the control (100% ETc), respectively.

Table 2. Yield and fruit quality performance statistics in response to deficit irrigation treatments of nectarine 'September Bright' under an Open Tatura canopy system during 2017/18 season.

Treatment	Fruit number (#/tree)	Yield (kg/tree)	Fruit weight (g)	Fruit sweetness (°Brix)	Fruit maturity (I _{AD})	Fruit firmness (kgf)	Fruit colour (% red)
0_I	142 abc	11.3 bc	80 c	17.2 e	1.0 ef	5.8 d	64 a
0_II	163 cd	16.6 def	104 fg	15.5 a	0.7 ab	5.2 a	75 cd
0_IIIa	126 a	11.1 bc	90 de	16.2 cd	0.8 bc	5.3 ab	73 bcd
0_IIIb	158 bcd	8.4 a	54 a	18.8 g	1.1 g	6.8 e	80 e
20_I	149 abcd	12.9 c	88 cd	17.1 e	0.9 de	5.8 d	60 a
20_II	155 bcd	16.3 de	106 gh	15.8 ab	0.7 a	5.2 a	77 de
20_IIIa	134 ab	11.9 bc	91 de	16.3 d	0.7 ab	5.1 a	72 bc
20_IIIb	151 abcd	9.6 ab	66 b	17.8 f	1.3 h	6.7 e	77 de
40_I	173 d	16.7 def	98 ef	16.4 d	1.0 f	5.9 d	62 a
40_II	166 cd	18.7 f	112 h	15.7 ab	0.8 cd	5.5 bc	70 b
40_IIIa	163 cd	15.5 d	97 ef	16.0 bc	0.9 cde	5.5 b	71 bc
Control	172 d	18.3 ef	109 gh	16.1 cd	0.9 de	5.7 cd	71 bc
ANOVA	*	***	***	***	***	***	***

ns, *, ** and *** indicate not determined, non-significant or significant differences at $P < 0.05$, 0.01 or 0.001 , respectively, for the two-way interaction irrigation treatments. Significant differences ($P < 0.05$) between irrigation treatments are denoted with different lower-case letters. Treatment values 0, 20 and 40 depict deficit (0, 20, 40% ETc) irrigation treatments and the period of fruit growth when deficit regime was applied (Stage I, III, IIIa, IIIb) compared to the control (100% ETc), respectively.

Table 3. Yield and fruit quality performance statistics in response to deficit irrigation treatments of nectarine 'September Bright' under an Open Tatura canopy system during 2018/19 season.

Treatment	Fruit number (#/tree)	Yield (kg/tree)	Fruit weight (g)	Fruit sweetness (°Brix)	Fruit maturity (I _{AD})	Fruit firmness (kgf)	Fruit colour (% red)
0_I	140 abcd	7.7 ab	57 ab	19.2 g	1.3 cd	6.7 cd	48 ab
0_II	122 ab	11.9 de	102 g	18.1 bc	1.1 a	5.9 a	55 c
0_IIIa	137 abcd	11.1 cd	82 d	17.5 a	1.0 a	5.9 a	56 c
0_IIIb	121 ab	5.7 a	49 a	20.0 h	1.3 de	6.9 de	63 d
20_I	133 abcd	9.1 bc	70 c	19.3 g	1.2 c	6.5 c	48 ab
20_II	112 a	10.9 cd	100 g	18.8 ef	1.0 ab	6.0 ab	56 c
20_IIIa	124 abc	10.6 cd	85 de	18.6 de	1.0 ab	6.1 ab	54 c
20_IIIb	123 abc	7.2 ab	60 b	19.0 fg	1.5 e	7.1 e	64 d
40_I	156 bcd	10.9 cd	70 c	19.3 g	1.4 d	6.8 d	47 a
40_II	157 cd	14.2 ef	91 ef	17.8 ab	1.2 b	6.1 b	57 c
40_IIIa	162 d	14.1 ef	88 def	17.9 abc	1.2 b	6.2 b	54 c
Control	163 d	14.8 f	94 fg	18.2 cd	1.2 b	6.2 b	52 bc
ANOVA	*	***	***	***	***	***	***

ns, *, ** and *** indicate not determined, non-significant or significant differences at $P < 0.05$, 0.01 or 0.001 , respectively, for the two-way interaction irrigation treatments. Significant differences ($P < 0.05$) between irrigation treatments are denoted with different lower-case letters. Treatment values 0, 20 and 40 depict deficit (0, 20, 40% ETc) irrigation treatments and the period of fruit growth when deficit regime was applied (Stage I, III, IIIa, IIIb) compared to the control (100% ETc), respectively.

Table 4. Yield and fruit quality performance statistics in response to deficit irrigation treatments of nectarine ‘September Bright’ under an Open Tatura canopy system during 2019/20 season.

Treatment	Fruit number (#/tree)	Yield (kg/tree)	Fruit weight (g)	Fruit sweetness (°Brix)	Fruit maturity (I _{AD})	Fruit firmness (kgf)	Fruit colour (% red)
0_I	113 ab	9.8 a	88 c	16.3 c	0.8 b	5.8 cd	78 bc
0_II	115 ab	13.0 bc	113 g	15.1 a	0.7 a	5.4 ab	82 cd
0_IIIa	143 bc	12.9 bc	90 cd	16.3 c	0.8 b	5.5 bc	82 cd
0_IIIb	160 c	9.0 a	57 a	17.6 e	1.0 d	6.5 e	85 de
20_I	99 a	9.7 a	98 de	17.1 d	0.9 bc	5.9 d	75 b
20_II	134 bc	14.9 cd	111 g	15.1 a	0.6 a	5.1 a	86 e
20_IIIa	136 bc	13.3 bc	98 de	16.0 bc	0.7 a	5.3 ab	83 de
20_IIIb	153 c	11.7 ab	76 b	16.9 d	1.0 d	6.4 e	83 de
40_I	131 bc	13.0 bc	100 ef	16.9 d	1.0 d	6.3 e	70 a
40_II	142 bc	15.5 cd	110 g	15.7 b	0.9 bc	5.9 d	75 b
40_IIIa	153 c	16.5 d	109 fg	16.2 bc	0.9 cd	6.0 d	77 b
Control	146 c	16.5 d	114 g	15.9 bc	0.8 b	5.8 cd	78 bc
ANOVA	**	***	***	***	***	***	***

ns, *, ** and *** indicate not determined, non-significant or significant differences at $P < 0.05$, 0.01 or 0.001 , respectively, for the two-way interaction irrigation treatments. Significant differences ($P < 0.05$) between irrigation treatments are denoted with different lower-case letters. Treatment values 0, 20 and 40 depict deficit (0, 20, 40% ETc) irrigation treatments and the period of fruit growth when deficit regime was applied (Stage I, III, IIIa, IIIb) compared to the control (100% ETc), respectively.

Table 5. Yield and fruit quality performance statistics in response to deficit irrigation treatments of nectarine ‘September Bright’ under an Open Tatura canopy system during 2020/21 season.

Treatment	Fruit number (#/tree)	Yield (kg/tree)	Fruit weight (g)	Fruit sweetness (°Brix)	Fruit maturity (I _{AD})	Fruit firmness (kgf)	Fruit colour (% red)
0_I	138 ab	16.8 abcd	124 cde	15.0 d	0.6 ab	5.4 b	74 bcd
0_II	157 b	19.7 de	128 def	14.0 a	0.6 ab	5.0 a	74 bcd
0_IIIa	146 ab	15.8 abc	110 ab	15.1 d	0.6 bc	5.2 ab	71 ab
0_IIIb	130 ab	13.2 a	104 a	15.9 f	0.8 de	5.8 c	83 e
20_I	139 ab	17.6 bcde	129 ef	14.8 cd	0.5 a	5.1 a	75 cd
20_II	121 a	16.1abcd	134 f	14.4 b	0.5 a	4.9 a	77 d
20_IIIa	134 ab	15.4 ab	119 bcd	14.8 cd	0.5 a	5.0 a	73 abc
20_IIIb	138 ab	15.8 abc	116 bc	15.5 e	0.8 ef	5.8 c	77 d
40_I	149 ab	19.6 de	132 ef	14.5 bc	0.9 fg	5.9 c	70 a
40_II	154 b	19.2 cde	126 def	14.4 b	0.7 cde	5.4 b	74 bcd
40_IIIa	194 c	21.2 e	110 ab	14.7 cd	0.9 g	5.7 c	70 a
Control	140 ab	18.4 bcde	134 f	14.6 bc	0.7 cd	5.4 b	74 bcd
ANOVA	**	***	***	***	***	***	***

ns, *, ** and *** indicate not determined, non-significant or significant differences at $P < 0.05$, 0.01 or 0.001 , respectively, for the two-way interaction irrigation treatments. Significant differences ($P < 0.05$) between irrigation treatments are denoted with different lower-case letters. Treatment values 0, 20 and 40 depict deficit (0, 20, 40% ETc) irrigation treatments and the period of fruit growth when deficit regime was applied (Stage I, III, IIIa, IIIb) compared to the control (100% ETc), respectively.

Table 6. Yield and fruit quality performance statistics in response to deficit irrigation treatments of nectarine 'September Bright' under an Open Tatura canopy system during 2021/22 season.

Treatment	Fruit number (#/tree)	Yield (kg/tree)	Fruit weight (g)	Fruit sweetness (°Brix)	Fruit maturity (LAD)	Fruit firmness (kgf)	Fruit colour (% red)
0_I	154	17.9	117 cde	17.8 abc	0.1 a	1.9 ab	89 cd
0_II	177	19.8	113 cde	17.3 ab	0.1 a	1.7 a	89 cd
0_IIIa	174	19.0	109 cd	17.9 bcd	0.2 ab	1.8 a	86 bc
0_IIIb	184	15.6	86 a	19.5 e	0.6 de	3.6 f	93 e
20_I	172	20.3	119 e	17.9 bc	0.1 a	2.0 abc	87 cd
20_II	193	20.8	109 c	17.8 abc	0.2 a	1.9 ab	91 de
20_IIIa	168	18.5	110 cd	17.8 abc	0.1 a	1.7 a	88 cd
20_IIIb	190	18.9	99 b	18.6 d	0.6 e	3.5 f	89 cd
40_I	186	21.8	118 de	18.1 cd	0.4 cd	2.8 e	82 a
40_II	170	20.5	121 e	17.8 abc	0.3 bc	2.3 bcd	83 ab
40_IIIa	204	23.0	113 cde	18.0 bcd	0.5 d	2.7 de	83 ab
Control	176	21.1	120 e	17.1 a	0.3 bc	2.4 cde	82 a
ANOVA	ns	ns	***	***	***	***	***

ns, *, ** and *** indicate not determined, non-significant or significant differences at $P < 0.05$, 0.01 or 0.001 , respectively, for the two-way interaction irrigation treatments. Significant differences ($P < 0.05$) between irrigation treatments are denoted with different lower-case letters. Treatment values 0, 20 and 40 depict deficit (0, 20, 40% ETc) irrigation treatments and the period of fruit growth when deficit regime was applied (Stage I, III, IIIa, IIIb) compared to the control (100% ETc), respectively.