FORCING VINE REGROWTH IN *VITIS VINIFERA* cv. TOURIGA NACIONAL AT DOURO REGION

Inês L. CABRAL[1], Anabela CARNEIRO[1], Joana VALENTE[2], Fernando ALVES[2], Frank S. ROGERSON[2], Artur MOREIRA[2], Pedro L. da COSTA[2], Susana M.P. CARVALHO[1], **Jorge QUEIROZ[1]**

[1]GreenUPorto & DGAOT, Faculty of Sciences, University of Porto, Campus de Vairão, Rua da Agrária, 747, 4485-646 Vairão, Portugal
[2]Symington Family Estates, Travessa Barão de Forrester 86, 4431-901 Vila Nova de Gaia, Portugal

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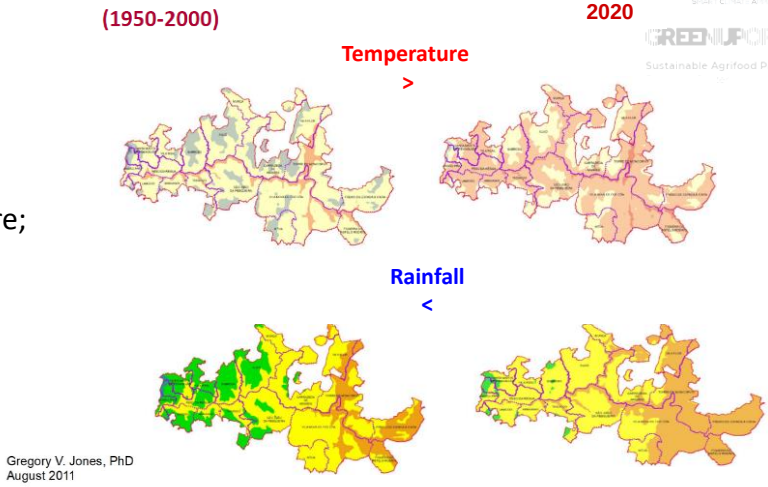
VISCA **-** "Vineyads' Integrated Smart Climate Application"

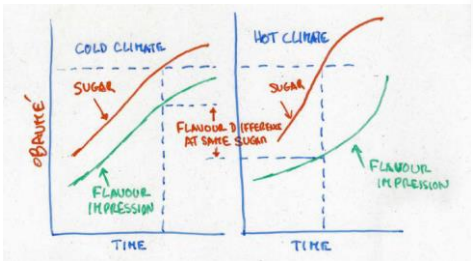
Introduction

- Climate change:
- Douro Region:
  - Increase of temperature;
  - Reduction of rainfall;
  - Extreme events;



Introduction

- Climate change
  - Impact on **fruit composition**;
  - **Unbalanced** fruit;



➢ ***CROP FORCING:*** Second pruning:

➢ All laterals, leaves and primary clusters removed.

➢ Retaining five nodes per shoot (Gu et al., 2012).

Aim to **delay maturation** stage to a cooler period;

Trial:

- Douro Superior;
- Quinta do Ataíde;
- Symington Family Estates

Experimental design

- ´4 blocks x 3 treatments x 8 vines:

1. Control - No CF (**CTRL**);
2. CF set 15 days after fruitset (**CF15**);
3. CF set 30 days after fruitset ("pea size" stage; **CF30**).
   - ➢ 96 plants in total.

- Touriga Nacional;
- Drip irrigated at 30% evapotranspiration (ETc).

RESULTS

Phenological Stages

Table 1: Effect of *Crop Forcing* on phenology in cv. Touriga Nacional.

Treat.	CF day	Phenological stages			
		Budbreak (C)	Fruitset (J)	Veraison (M)	Harvest (N)
CTRL	-	100	155	221	279 6 October
CF15	6 June (DOY 158)	165	(Downey Mildew – Organic Viticulture: treatments with cooper every 3 days)		
CF30	26 June (DOY 178)	186	220	306	331 27 November

Vegetative growth

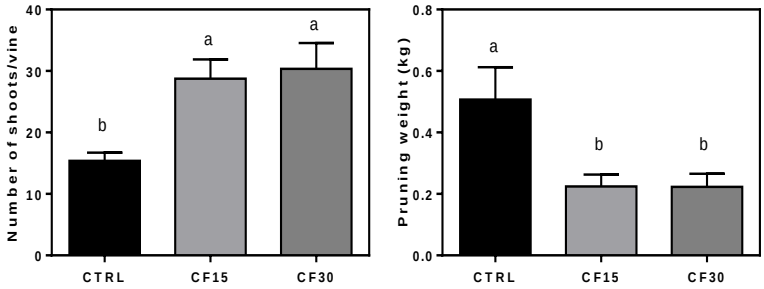


Figure 2: Effect of *Crop Forcing* in number of shoots and pruning weight in cv. Touriga Nacional. Letters indicate statistically differences (p<0,01).

Yield

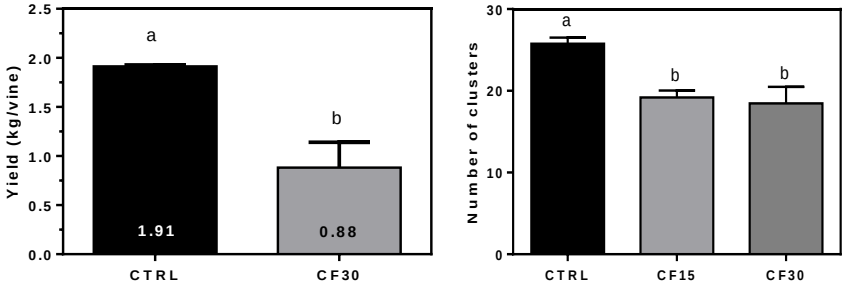


Figure 3: Effect of *Crop Forcing* in yield and number of clusters per vine in cv. Touriga Nacional. Letters indicate statistically differences (p<0,01).

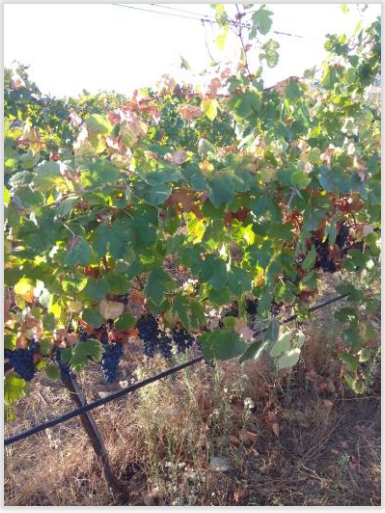
Quality

Table 2: Effect of *Crop Forcing* on berry weight and quality of berry in cv. Touriga Nacional. Asterisks indicate statistically differences (p<0,05).

	DOY	Berry weight (g)	pH	˚Brix	Total Acidity (g/l)	Tartaric Acid (g/l)	Malic Acid (g/l)
CTRL	276	1,31a	3,74a	23,9a	4,16b	7,35a	0,98b
CF30	318	0,82b	3,35b	17,0b	8,82a	5,25b	5,13a
Sig.		**	**	*	**	n.s.	**

Conclusions *Crop Forcing*:

- Delayed phenology.
- Delayed ripening:
  - ✓Maturation from warmer to cooler months
- Reduced yield:
  - ✓Less clusters;
  - ✓Less weight of clusters;
  - ✓Smaller berries;
- Influenced Quality Parameters:
  - ✓Lower pH;
  - ✓Higher titrable acidity;
  - ✓Lower sugar content;
  - ✓Higher malic acid;
- Increased the risk of diseases.



Crop Forcing 2019

11 June 2019

25 June 2019

THANK YOU FOR YOUR ATTENTION!