

CLONAL EVALUATION OF POTENTIAL FRUITFULNESS IN CHARDONNAY ACROSS SITES IN A UK VINEYARD

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Bud fertility is the first indicator of yield variation

The reproductive cycle of the grapevine spans two seasons and the formation of inflorescences (flower clusters) clearly defined by 3 stages:

i) Initiation ii) formation of inflorescence and tendril primordia

iii) differentiation of flowers (Pratt, 1971; Srinivasan and Mullins, 1981; Vasconcelos et al., 2009)

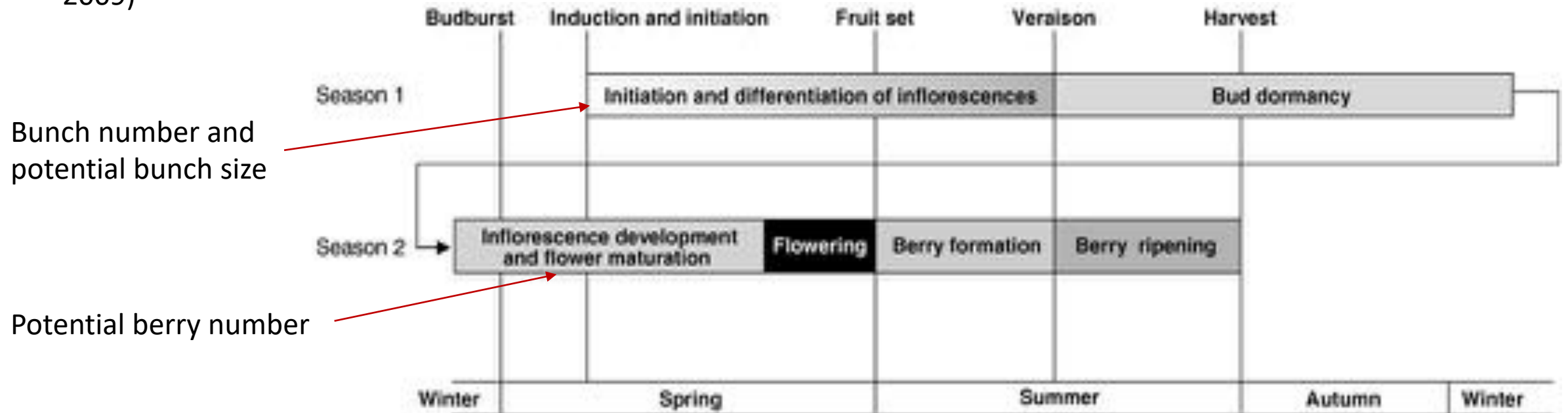


Figure 1: Reproductive phenology of the grapevine (Carmona, 2008)

Bud fruitfulness is influenced by biotic and abiotic factors

Biotic

Cultivar

Node position

Clone?

Abiotic

Canopy architecture

Rootstock

Light

Temperature

Vigour

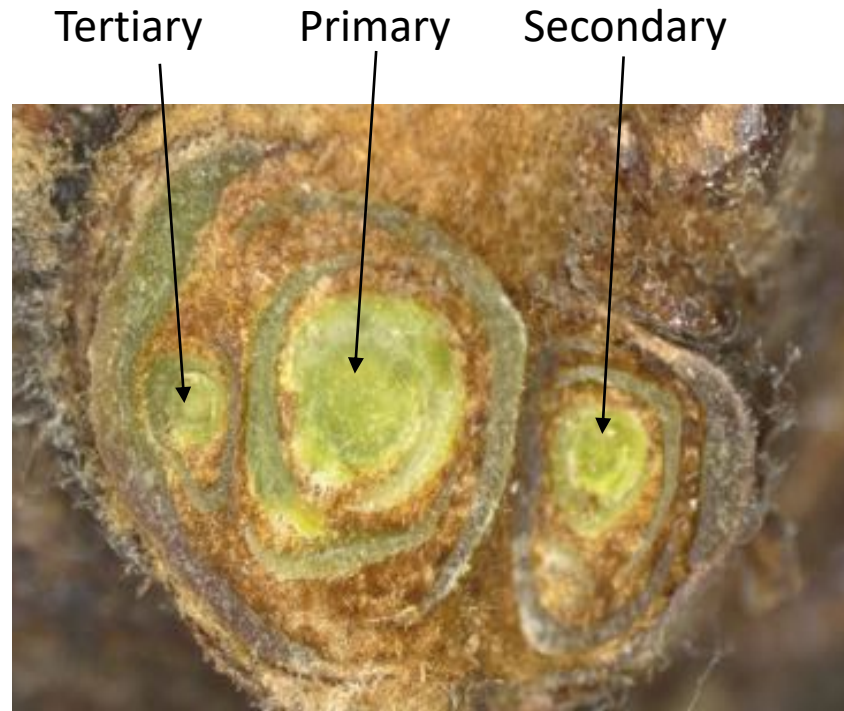


Fig 2: Cross section of a Riesling compound bud



Cross section of a Riesling primary bud



Cross section of a Chardonnay primary bud

Clonal variation in the context of fertility is hitherto unstudied



Clonal studies of Pinot Noir and Chardonnay published in all major sparkling wine regions (Anderson et al., 2008a; b; Mercado-Martín, Wolpert and Smith, 2006; Reynolds et al., 2004a)

Fertility studies in California investigated methods of assessing fruitfulness (Sánchez and Dokoozlian, 2005).

Aims

Investigate clonal variability in the context of fertility

Express fertility along the cane pertaining to bunch number and size

Establish a statistical reference for further research into flowering and fruit-set in Chardonnay in the UK

Under the microscope



Clones 75 and 95 chosen across two different sites

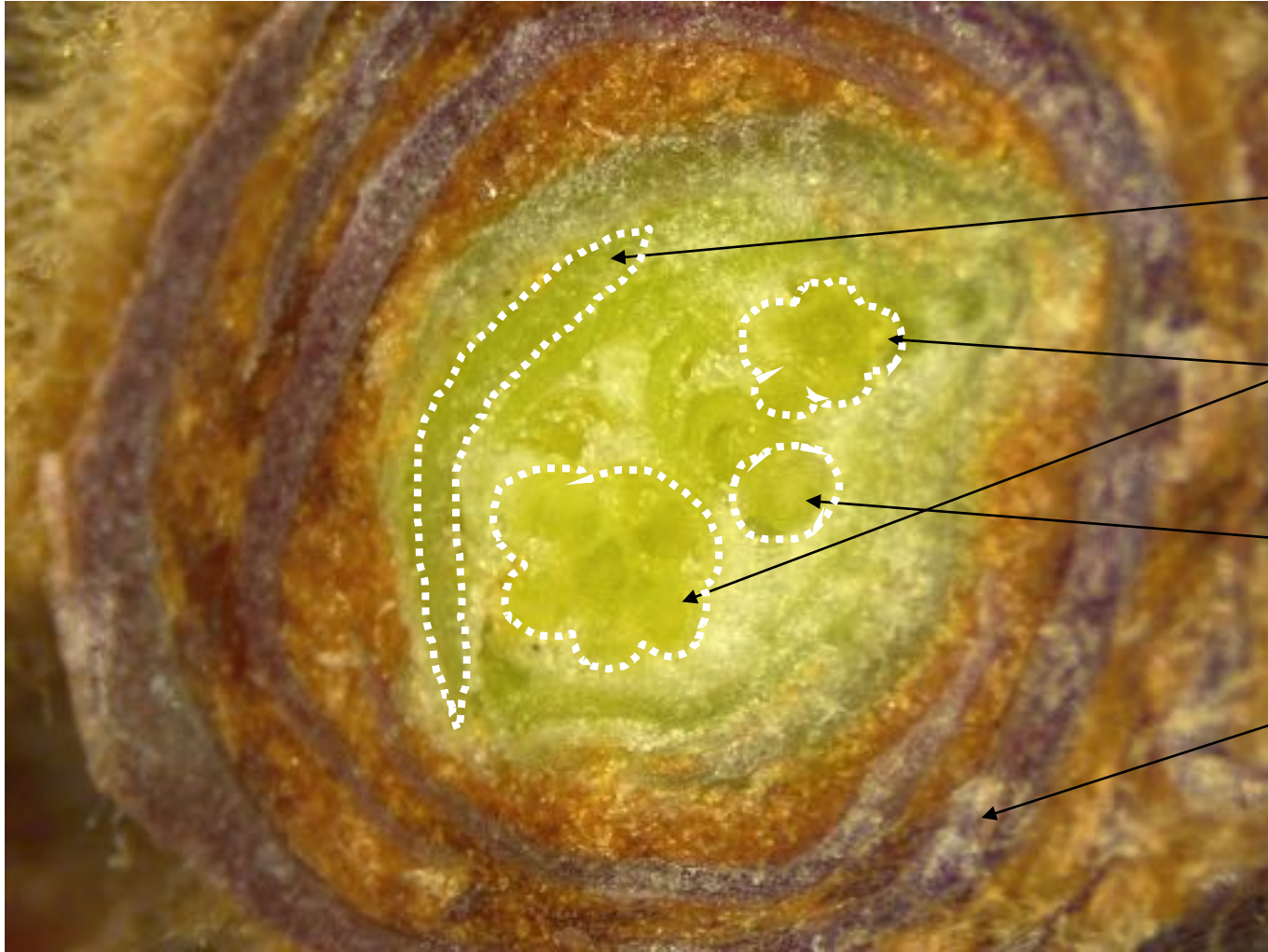
Buds 1-10 divided and dissected perpendicular to the apex

Primordia number and size recorded

Incidence of Primary Bud Necrosis recorded

Cane mass, length and diameter recorded

Under the Microscope (2)



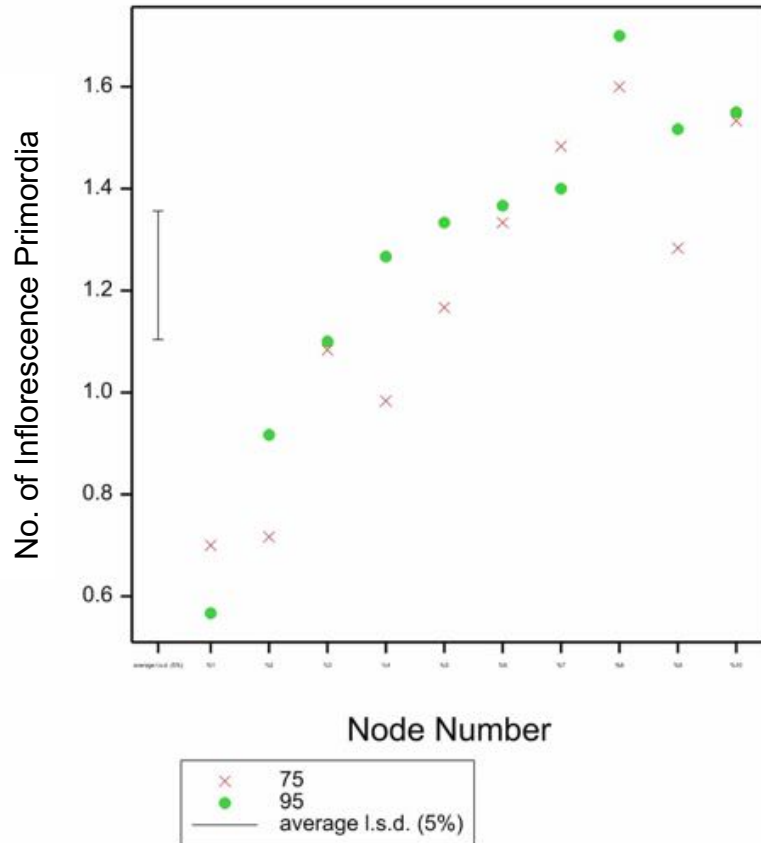
Leaf primordia

Inflorescence primordia

Shoot apex

Bud scales

Node position highly significant on fertility

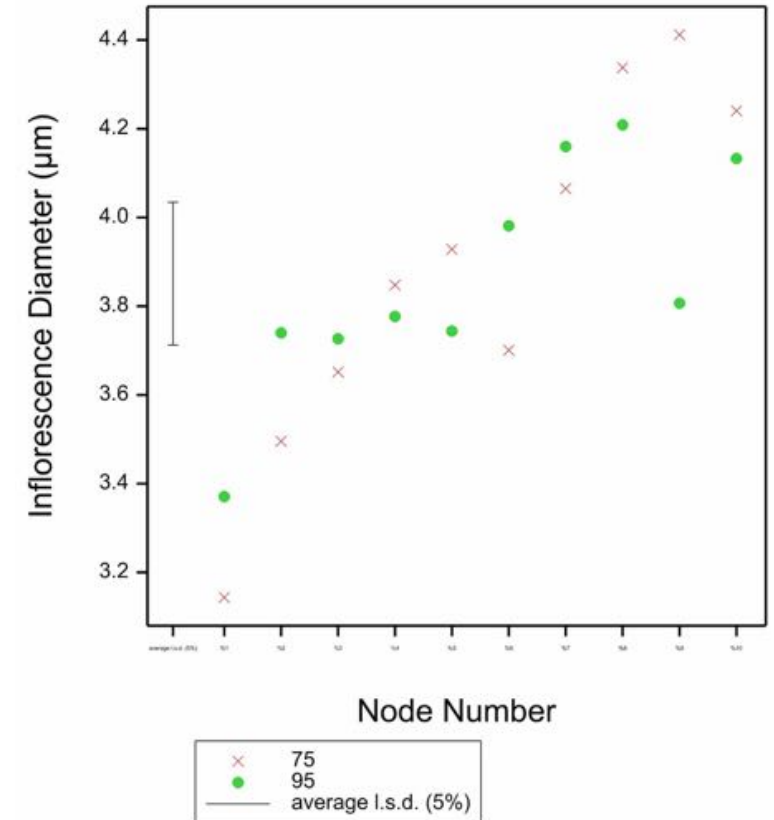


Fertility is lowest and nodes 1-3 in both clones

Clone 75: IP number increases linearly to node 8

Clone 95: IP number increases linearly to bud 10

IP size:node varied between clones



Results will enable further research opportunities



Low yields from basal buds preclude us from spur pruning Chardonnay

Technique successfully assessed potential fruitfulness and primordia size

Produced a statistical platform to assess correlation between primordia size, flower number and fruit set

Investigation into fertility beyond node 10

Industry implications

Assess fertility in other cultivars

Is there a link between IP size and flower number?

Help understand fluctuating yields in UK

Check for levels of Primary Bud Necrosis and bud eating mites

Explore differences between other clones

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