

Year of Production and Canopy Region Influence Bean Characteristics and Beverage Quality of Arabica Coffee

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SUMMARY

Berry characteristics at harvest and organoleptic properties of the coffee beverage were evaluated in 1997 and 1998 on 18-year old coffee arabica trees. The trees were at two different production years in a 5-year rotational coppicing cycle; one group of trees in its third year (Y3) of production and a second group in its fifth year (Y5) of production, the last year before rejuvenating by coppicing. Light availability, dry matter partitioning and biochemical content were measured in three distinct canopy regions on Y3 and Y5 trees in 1998. In the two years, the bean dry weight was higher on Y3 trees than on Y5 trees but was not affected by the canopy region. Significant differences between trees in their third or fifth production were observed in 1997 for beverage quality. Trees in Y3 had a more balanced fruit to leaf ratio than that of trees in Y5. In 1998, significant differences for beverage quality were observed between canopy regions of the Y5 trees. Coffee beans from branches in the upper canopy region had higher fat content than those harvested in the middle and lower regions. Coffee beverage quality prepared with beans collected in the upper region was better than that originating from the middle and lower regions. The upper region was characterized by a more acid beverage and was preferred by the judging panel. The upper canopy region had a better-balanced dry matter distribution between leaves, berries and twig (25-31% of berries, 20-28% of leaves and 36-40% of wood, respectively). On branches in the middle canopy region, bean dry weight was significantly greater than that of the other two organs combined (leaves and twig). In the lower canopy, twig dry matter was much greater than that of berries and leaves combined. Low bean weight of Y5 trees can be attributed to low carbohydrate reserves of these trees. We make the hypothesis that depletion of reserves in Y5 trees, more accentuated in middle and lower canopy regions, exacerbated competition for carbon allocation within tree with detrimental effects on bean filling and coffee beverage quality. On top of harvesting only ripe berries, agricultural practices such as pruning that provides a balanced fruit to leaf ratio could help produce coffee of higher quality.