

Resumen

Se estudiaron las características y capacidad de absorción de las raíces de caña planta a las 7 semanas y 5 meses de la siembra. Con el tiempo las raíces del brote aumentan su capacidad de absorción, especialmente a bajas concentraciones, e igualmente aumenta su aporte relativo en la absorción total, por encima del aumento en su volumen físico. Se confirma así la transferencia de funciones del sistema radical del nudo al del brote, y se sugieren implicancias de carácter agrícola.

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Comunicaciones

Changes in the respiratory quotient of embryos of *Coffea canephora* 'S.274' with time

Sumario. El aumento del cociente respiratorio (RQ) observado linealmente con tiempo en los embriones de *Coffea canephora* 'S.274' ha sido explicado como debido a que el material puede respirar con intermediarios del ciclo del ácido tricloroacético (TCA), de bajo a altamente oxidado, en una manera secuencial.

The high respiratory quotient we reported earlier in coffee embryos was related to the involvement of TCA cycle intermediates as substrates of respiration (5). It is widely agreed that Krebs' cycle acids do not occur in any tissue in sufficient quantities to substantiate respiratory activity for prolonged periods (3). Nutritionally dependent organs such as coffee embryos should be excellent material for studying the respiratory quotient over a period of time when the TCA cycle intermediates on which they respire start dwindling. The present study concerns this aspect.

The fruits of *Coffea canephora* 'S.274' were collected about seven months after anthesis. Embryos were collected and respiratory activity measured, as described previously by the authors (5).

The RQ values were recorded continuously for a period of 6 hours. Both the observed and estimated values by the least squares method are given (Table 1). The RQ value increased linearly from 1.2427 (0.5 hrs) to 1.4989 (6 hrs), instead of remaining more or less constant (Table 1, Fig. 1). This linear increase of RQ with time is interesting as well as intriguing.

Respiratory quotients have not been studied with time in any plant material except for cambial tissues and germinating seeds. The RQ in cambial tissues (1) and of nine out of ten species which Stiles and Leach (4) examined, showed a decrease with time. Germinating seeds of *Fagopyrum esculentum* and peas, on the other hand, registered an increase of RQ with time (2, 4). In peas, it increased from 2.0 to 3.0 in 6 hours (2). The increasing trend of RQ observed in this study agrees with those reported for peas and *Fagopyrum esculentum*. This is probably the first study

Table 1—Changes in the RQ values of embryos of *C. canephora* S.274 with time (Mean of 4 replications).

Time in Hours	RQ Observed	RQ Estimated
0.5	1.2427 ± 0.0753	1.24249
1.0	1.2751 ± 0.0471	1.26439
2.0	1.2979 ± 0.0598	1.30819
3.0	1.3807 ± 0.0291	1.35199
3.5	1.3148 ± 0.0191	1.37389
4.0	1.4174 ± 0.0258	1.39579
4.5	1.4238 ± 0.0802	1.41769
5.0	1.4430 ± 0.0390	1.43959
5.5	1.4726 ± 0.0148	1.46149
6.0	1.4989 ± 0.0416	1.48339

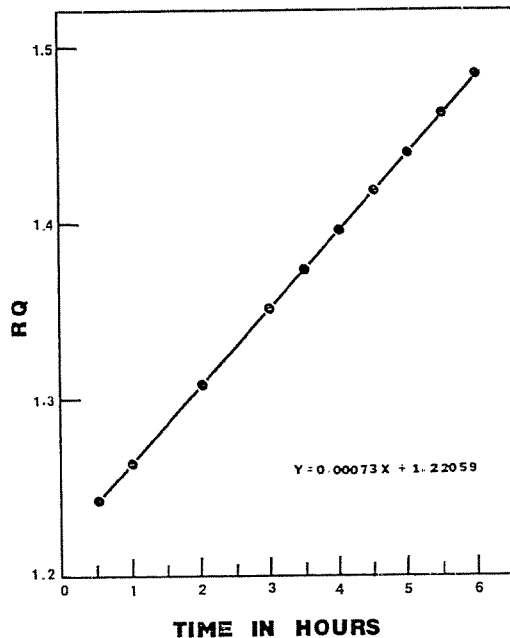


Fig. 1—Respiratory quotient as a function of time in the embryos of *C. canephora* S. 274.

using embryos as an experimental material reporting such a linearly increasing RQ.

In germinating seeds, the changes in RQ have been broadly explained by Stiles (3) as due to different substrates that the tissue oxidizes from time to time. Recently, the intermediates of Krebs' cycle have been pinpointed as the possible agents which bring about high RQ in the embryos of several types of coffee plants studied, including *C. canephora* S. 274 (5). In view of this work, it is thought that the coffee embryos might sequentially respire upon substrates with lower to higher degrees of oxidation. In the early stages of respiration, substrates like pyruvate, which give an RQ of 1.2, might be oxidized. Substrates like malate and oxaloacetate or a mixture of similar acids might be metabolized, at stages of respiration when RQ values touch 1.4 or more. If a situation akin to this operates in embryos, then the observed linear increase in RQ values is explained. It is premature to draw such conclusions, however, until information on mitochondrial oxidation of exogenously added substrates and blockage of specific steps of Krebs' cycle using inhibitors are available, to elucidate the real metabolic status of embryo respiration. Work along these lines would produce extremely fruitful results.

Summary

The linear increase of RQ with time in embryos of *Coffea canephora* 'S. 274' has been explained on the grounds that the material might respire on low to highly oxidized TCA cycle intermediates in a sequential fashion.

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Estudo do potencial de sorgo (*Sorghum bicolor*) granífero sob condições do meio São Francisco

Abstract. Commercial hybrid sorghum were evaluated for grain production at Mandacaru Experimental Station, Juazeiro-Bahia. The varieties 'Icapal' and 'Serena' were included in the trial as control.

The planting was performed in a ridge-furrow system with two rows spaced of 40 cm apart in the center part of a 70 cm ridge, with approximately 15 plants per meter in each row.

The results indicate the technical viability of sorghum cultivation under irrigated conditions, with an average productivity of 9313 kg/ha. The hybrids performed better than the varieties, mainly in terms of grain production and earliness.

Introdução

O Vale irrigado do São Francisco vem sendo explorado por culturas que apresentam alta rentabilidade econômica, como cebola, melão, melancia e uva. Com a implantação de novos projetos de irrigação, a exploração desta culturas ficará limitada pelo mercado consu-