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‘Bola de Oro’ a promising grafting method that creates a new Arabica tree architecture

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Rationale

There are several uses for grafting in fruit tree crop, including plant propagation. In addition to propagation, grafting can avoid a juvenile state, as an adult scion grafted onto a juvenile rootstock will maintain its adult state and ability to bear fruit. Here we present a new grafting technique that deeply modifies the architecture of the plant, its precocity and its yield. we call it 'Bola de oro' for the shape in half-sphere that it confers to the plant.

Methods

the grafting method 'Bola de oro' consists in grafting early a plagiotropic axis on a rootstock from seedling (P1). The rootstock can be Arabica or Robusta seed.

We describe the impact of this grafting technique on the architecture of the plant in four varieties. Morever, through an interview of 10 experienced coffee pickers we received their impression on the impact of the architecture in terms of speed of picking.

Results

The architecture of the plant is deeply modified (P2). The general form which is established from the 3rd year resembles a half-sphere (P3) of a diameter of 2 meters and a height ranging between 1 m and 1.4 m. The precocity are remarkable, since we observe a first bloom from the first year (P4). Our observations on the harvests at 2, 3 years showed a yield that seems superior to normal plants (non-grafted plants). This phenomenom is even more remarkable for varieties with low productivity such as Geisha or Laurina (P5). Experienced harvesters estimate that harvesting productivity could be increased by 20 to 30% due its easy access. It is also observed that the plant protects the soil much more, which would facilitate better weed control. On the other hand, due to the diameter of the half-sphere, it is estimated that there would be fewer plants per hectare (2500 plants/ha would be an optimal density). A saving on pruning is achieved because there is no suckers to cut.

Conclusions & Perspectives

We believe that Bola de Oro is a promising innovation that could increase the profitability of coffee growing, especially for small producers in montainous areas. We now propose to study it in several edapho-climatic contexts and in two cropping systems (full-sun *vs* agroforestry).

P1: A young plagiotropic branch (2 to 4 internodes) is grafted onto a young Robusta or Arabica seedling.

P2: notice the architecture of the young plant

P3: the plant at the 3rd year resembles a half-sphere, hence the name 'Bola de oro'. cv MS01 in agroforestry

P4: notice the first fruits formed on 9-month-old plants

P5: Laurina variety in foreground, grafted using the 'Bola de oro' method.