HYBRID-TEA ROSE BREEDING: APPROACHES TO INCREASE SEED PRODUCTION AND GERMINATION

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Hybrid-Tea rose breeding has worldwide great economical importance for production of new cultivars of roses (Rosa x hybrida L.). Seed production and germination are important bottlenecks for breeding companies which press for novelty by increasing phenotypic variability. Moreover, the production of germinating seeds is generally lower than many other crops, often not higher than 30%, with hip content usually ranging between one to 30 seeds. The selection of fertile parents, by detection of fertility related markers, could be a strategy to raise seed production and to obtain viable and germinating seeds. Indeed, environment interactions during seed stratification, combining the action of cell-wall macerating enzymes with hormone pre-germination treatments, could also optimize some aspects of the germination process.

In 2008 a high and a low fertile pollen donor and a high and a low fertile seed parent, selected from a company breeding database, were crossed in partial diallel. More than 600 hybridizations produced a total of 22011,00 seeds, with a value of 60,2 (seeds/hybridization) for the crosses between the two fertile parents, a value of 0,04 for the crosses between the two low fertile parents, a value of 9 for the crosses between the low fertile seed parent and the high fertile pollen donor and a value of 1,78 between the fertile seed parent and the low fertile pollen donor. The recovered seeds were cold stratified at 4°C in sand for 40 days, interlaced by warm treatment at 20 °C for 22 days. Pre-stratification treatments were applied in combination or not with seed sterilization, compost activator, artificial inoculations with either a mix of fungi or a mix of bacteria or Alternaria sp. (previously isolated from of the rose hips) or a treatment with Trichoderma sp. (commercial formulation). Pre-germination treatments were also applied by soaking the stratified seeds overnight in solutions containing the macerating enzyme driselase and the hormone GA3, at different concentrations and in combination between them. Seeds were finally sown on cold perlite beds at a germination density of 209 seeds/m², in the greenhouse. The mean germination time and the percentage of seed germination were evaluated for each treatment. Parents fertility and environmental factors affect rose seed production and germination, therefore they should both be considered in a successful breeding strategy. In order to increase the possibility of obtaining new cultivars, further studies on fungal contamination, seed vitality and physiological or physical dormancy will be carried out. Besides, morphological, genetic and molecular approaches are currently attempted to identify possible markers related to fertility.