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Philippe Label, Isabelle Lucas, Claude Joseph, Daniel Cornu

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INDOLE-3-ACETIC ACID, ABSCISIC ACID AND CYTOKININS ENDOGENOUS LEVELS IN ENDOSPERM AND EMBRYO OF WALNUT (*JUGLANS REGIA* L.) DURING NUT DEVELOPMENT.

P. LABEL¹, I. LUCAS¹, C. JOSEPH² & D. CORNU¹

1. Institut National de la Recherche Agronomique, Station d'Amélioration des Arbres Forestiers, Avenue de la Pomme de Pin, F-45160, Ardon, FRANCE ; 2. Université d'Orléans, Faculté des Sciences, Laboratoire de Biologie des Ligneux Forestiers, F-45067, Orléans Cedex 02, FRANCE.

In our laboratory, fragments of zygotic embryo are presently the best plant material to induce somatic embryogenesis in walnut. This induction can happen only in a very short time-window of the fruit development. To gain control over the embryogenic induction process we have investigated the hormonal state of the zygotic embryo during the development of the nut including the period when somatic embryogenesis induction is possible. Development of the nut has been characterized by measurements of its volume and weight. Volume of liquid endosperm per nut and mass of the embryo have been determined. Indole-3-acetic acid (IAA), abscisic acid (ABA), zeatin riboside (ZR), zeatin, isopentenyladenine (IP) and isopentenyladenosine (IPA) were measured by enzyme-linked immunosorbent assay (ELISA) in the embryo and the associated liquid endosperm at ten different dates from 15 days after pollination (DAP) to 91 DAP during the nut development. Embryogenic induction rates were also measured and were optimal between 56 and 63 DAP. Results show undetectable levels of IP, IPA and Z in these tissues all along the period tested. ZR was detected in the endosperm (up to 0.15 nmol/embryo), and in the embryo (up to 0.35 nmol/embryo). ABA and IAA were low in the endosperm (0.1 and 1 nmol/embryo respectively) compared to the embryo content (up to 1.2 and up to 33 nmol/embryo respectively). These results are discussed with respective embryogenic induction rates of the corresponding zygotic embryo tissues. Exogenous hormonal requirements for embryogenic induction are discussed in relation with endogenous hormonal state of the zygotic fragment treated in the embryogenic induction process. This is the first report of a possible relationship between endogenous hormonal status of a tissue and its further ability to somatic embryogenesis induction.