

# SweTree Technologies

Innovators in Forest Biotechnology

## D-amino acid technology

**Select your transgenic plants with environmentally friendly markers**

Plant gene transformation is a prerequisite for the generation of transgenic trees. This process is dependent on having a selectable marker gene incorporated into the plant genome together with the gene of interest. Until now, these marker genes have mainly been antibiotic resistance genes. Due to a growing concern from regulatory agencies about the use of antibiotic resistance for this purpose, there is now a strong demand for alternative, environmentally friendly markers.



- Our D-amino acid technology can function as a universal solution for a variety of applications and has the potential to make a significant impact on transgenic forestry in general.

### **Selection markers**

We have patented a novel method using D-amino acids as a selectable agent to identify and select successfully transformed plants. Plants lack the capacity to metabolize D-amino acids, several of which are toxic to plants. By inserting a gene involved in D-amino acid metabolism into the plant, together with the gene of interest, the former serves as a selectable marker for successfully transformed plants.

The phenotype of a plant transformed with D-amino acids metabolizing enzyme is clearly distinguishable from the wild type immediately following germination when treated with D-amino acids. Selection as well as counter selection is possible using D-amino acid oxidase (DAAO) as selectable marker and different D-amino acids as selectable agents.

**Herbicide resistance**

Some of the novel marker genes based on D-amino acids also function as herbicide resistance genes. This will be extremely useful for plantation forestry where intense herbicide treatment is often required. The D-amino acids used will also serve as a source of nitrogen for the transgenic plants.

**Transgenic containment**

Using certain D-amino acid derivatives for counter selection, the DAAO marker can work as a herbicide that selectively kills transgenic plants containing the DAAO marker and leaves all wild type plants alive.