

## Cooperative Pinus Improvement Program in Brazil for wood and resin production: Current results

T3.34 Tree improvement delivery system: breeding, selection, and seed and seedling production

**Ananda Virginia De Aguiar**<sup>1</sup>

Wanderley dos Santos<sup>2</sup>, Valderês Aparecida de Sousa<sup>1</sup>, Juliana Denghardt<sup>1</sup>, Regina Caetano Quisen<sup>1</sup>, Jorge Luis Monteiro Matos<sup>3</sup>, Ivan Venson<sup>3</sup>, José Guilherme Prata<sup>3</sup>, Edilson Oliveira Batista<sup>1</sup>, Mário Luiz Teixeira de Moraes<sup>1</sup>, Miguel Luiz Menezes Freitas<sup>4</sup>, Osmar Vila boas Vila boas<sup>4</sup>, Elenice Fritszons<sup>1</sup>, Marcos Silveira Wrege<sup>1</sup>, Bruno Marchetti Souza<sup>5</sup>, José Cambuim<sup>5</sup>, Jarbas Y. Shimizu<sup>6</sup>

<sup>1</sup> Embrapa Florestas

<sup>2</sup> Fundo Cooperativo de Melhoramento de Pinus (Funpinus)

<sup>3</sup> Universidade Federal do Paraná (UFPR)

<sup>4</sup> Instituto de Pesquisas Ambientais (IPA)

<sup>5</sup> Universidade Estadual Paulista Julio de Mesquita Filho- Unesp de Ilha Solteira (UNESP)

<sup>6</sup> Consultant

**Abstract:** *Pinus* is the second forest genus most commercially planted in Brazil. The principal economic products generated from these plantations are wood and resin. Its wood is widely used in furniture, cellulose, and paper production, civil construction industries, among other applications. The resin is applied in solvents, paints, varnish and adhesives industries, pharmaceuticals and cleaning products. Brazil is among the largest producers of sawn wood and resin in the world. In view of its economic importance, a cooperative project for genetic improvement of pine trees (PCMP), in Brazil, was created in a joint effort between Embrapa Florestas, Associação Catarinense de Empresas Florestais (ACR) and Associação Paranaense de Empresas de Base Florestal (APRE). Ten companies participate in the project with the aim of developing pine seeds and clones that exhibit high productivity and quality in both wood and resin. Selection strategies adopted include mass selection, intrapopulation recurrent selection and recurrent reciprocal selection. As a means of reducing the period of generation cycles and maximizing genetic gains over time, we resort to cloning, top-grafting, somatic embryogenesis and genomic wide selection. The preliminary findings of the PCMP include: generation of a germplasm bank of selected trees based on strict criteria regarding the shape of the stem and crown, resin production and characteristics of wood quality and resin, designated to compose breeding populations and improved seed orchards; establishment of clonal seed orchards of *P. taeda*, *P. elliottii*, *P. patula* and *P. elliottii* x *P. caribaea* hybrids; installation of a network of test of progeny and stands of *P. taeda*, *P. patula* and hybrids, with materials selected from commercial stands and also in first generation of progeny tests; obtaining strobili at early age (three years old) for some selected genotypes; advance in development of somatic embryogenesis protocols for *P. taeda*, hybrids and *P. elliottii*; interspecific hybrid seeds of *Pinus* spp. production; ongoing controlled pollination activities among tested materials; technicians and students training in the processes of grafting, controlled pollination and evaluation of parent trees. The collaboration between research institutions, universities, and affiliated companies has been the primary strength of this program.

Acknowledgments: The associated companies from Funpinus