



Research News

Industrial fibre crops

Cellulosic fibres have been used since time immemorial for tools and instruments, ropes and packaging, clothing, bedding and housing. Environmental issues have led to renewed interest in the agro-industrial production of non-wood fibre crops such as flax and hemp for a large number of applications.

The development of the various novel market outlets - besides the traditional end-uses (linen, yarns and ropes, and speciality papers) - is requiring development of new cost-effective production technologies. The steps affecting product quality in the production chain are demanding attention from crop growing at the farm to end-product consumer satisfaction. The price and performance ratio should be balanced for each different application.

Activities

We have extensive background knowledge of the various aspects of plant fibre isolation, processing and utilisation in paper and pulp, as well as non-woven, geotextiles, building and construction materials, thermoset and thermoplastic composite materials for automotive and consumer markets, which is actively deployed for a wide range of industrial innovation in cellulosic fibre technologies. Adjustments of fibre properties by chemical or physical methods to enhance the performance in technical applications are aiming at the full exploitation of the fibre properties combined with the socio-economic demands and industrial specifications.

New market outlets or processing technologies are being developed for a wide range of different plant fibres: domestic grown crops as flax and fibre hemp as well as exotic products jute, kenaf, sisal, coir (coconut fibre) and kapok. Also attention is being given to valorise agro-residues such as wheat straw or to utilise the specific fibre constituents (cellulose, lignin, silica).

Examples of agro-fibre projects

- Novel isolation procedures of cellulosic fibres from plant tissues (flax and hemp)
- Objective (instrumental) quality assessment of fibres
- Compounding of jute in fibre reinforced polypropylene composite materials for injection moulded products, finding application in consumer goods such as packaging (crates, trays, pallets), toys, furniture, car parts.
- Production process of coir based building boards from the whole husks, without chemical binders
- Thermal and acoustic insulation panels based on flax or hemp
- Valorisation of residual lignin as adhesive, polymer additive
- Improved dyeing and bleaching technologies for coir products
- Durability enhancement of fully biodegradable geotextiles
- Compatibilisation of fibre matrix interactions in thermosets, thermoplastics and inorganic binder systems
- Utilisation of wheat straw by extraction of cellulose, lignin and silica
- Cascade use of bio-mass (agro-residues): combining of fibre extraction and energy crop conversion

Information

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