



**Project Title:** Pulsed Power Technology for Enhancing Oil Recovery from Cotton Seeds

**Date of Commencement:** 15<sup>th</sup> October 2009

**Date of Completion:** 31<sup>ST</sup> March 2012

**Principal Investigator:** B. S. Parikh, Assistant Director [email: ceci@atira.in]

**Objectives:** The Main objective of the Project is to enhance Recovery of Cotton Seed Oil from Cotton Seeds, to the extent of ~ 1.4-2.0 %, using the PEF Technology, developed in Germany.

- Adoption of Pulsed Power Technology to increase the yield of oil production from cotton-seed.
- Optimization of the Technical /Operational parameters to maximize the oil production.
- Modification of the process/technology to suit extraction of cottonseed oil under Indian condition.
- Techno-commercial viability study at ATIRA to make the technology suitable for the industries of the state.
- Study the cost economics aspect of the enhanced oil recovery system.

**Conclusions, summarizing the achievements and indication for future work and Commercialization:**

**Achievement:**

- The Oil Recovery is enhanced by around 2 %, when the Screw Expeller, with different design was used.
- Additional oil recovery of about 1 % is achievable, when the PEF processed Seeds are expelled in the Screw Expeller is used.
- Based on observations, findings and results obtained, at an extended experimental trials conducted at ATIRA, the Techno Economic Viability calculations were made.
  1. The Cost for the PEF unit, having processing capacity of around 15-18 Tons of Cotton Seeds per day must not exceed **Rs. 55-60 Lacs**.
  2. For ensuring Pay Back Period of 3 years, the capital cost of Screw Expeller must not exceed **Rs. 32-35 Lacs**.



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### **Future Work including Plans for Commercialization:**

- The Screw Expeller, used in the Process needs to be scaled up and it should be fabricated indigenously. This will have impact on the Capital Cost of the same, which will help a lot in making the PEF Technology viable.
- The capital cost of Pulsed Power Unit, which is the core of the PEF Technology, is prohibitively high. The PEF Technology will become viable and affordable if the same is brought down by making the unit indigenously, with permission from DIL, Germany, who is the knowledge partner.
- Once, the commercial model is ready, at an affordable cost, efforts will have to be put in to look for the industry who can adopt the innovation for their benefits.
- The segment of the Industries, which will derive benefits from the findings of R & D project, on commercialization, will be the Cotton Seed Oil Industries.

### **Papers in Conferences:**

- Enhanced Oil Recovery from Cotton Seed adopting Pulsed Power Technology; presented at 52nd Joint Technological Conference of ATIRA, BTRA, NITRA and SITRA, held at Coimbtore, on 30th July, 2011
- Techno Economic Viability of Enhanced Oil Recovery using PEF Technology; presented at 53rd Joint Technological Conference of ATIRA, BTRA, NITRA and SITRA, held at Mumbai, on 17th February, 2012

Facility, created at ATIRA, under the Project and available for the Use of Industrial Clients:

(a) The Pulsed Power Unit, with Feed Assembly:



**(b) The Screw Expeller, having expelling capacity from 500 Gms to 50 Kgs per hour, depending on the seeds.**

