

Agricultural Plastics

What are they?

Why are they 'hard stuff'?

Can the challenges be surmounted?

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recycle this plastic

<http://facebook.com/RecyclingAgriculturalPlastics>



What Are Agricultural Plastics?

Answer: agricultural plastics include the many different film and rigid products now used in all sectors of agriculture.

Bunker silo covers. Sheets of heavy duty black/white film, some reinforced with polyester.



Bale wrap. Stretch film wrapped around individual bales of hay or a line of hay bales.

Drip tape, irrigation pipe, greenhouses



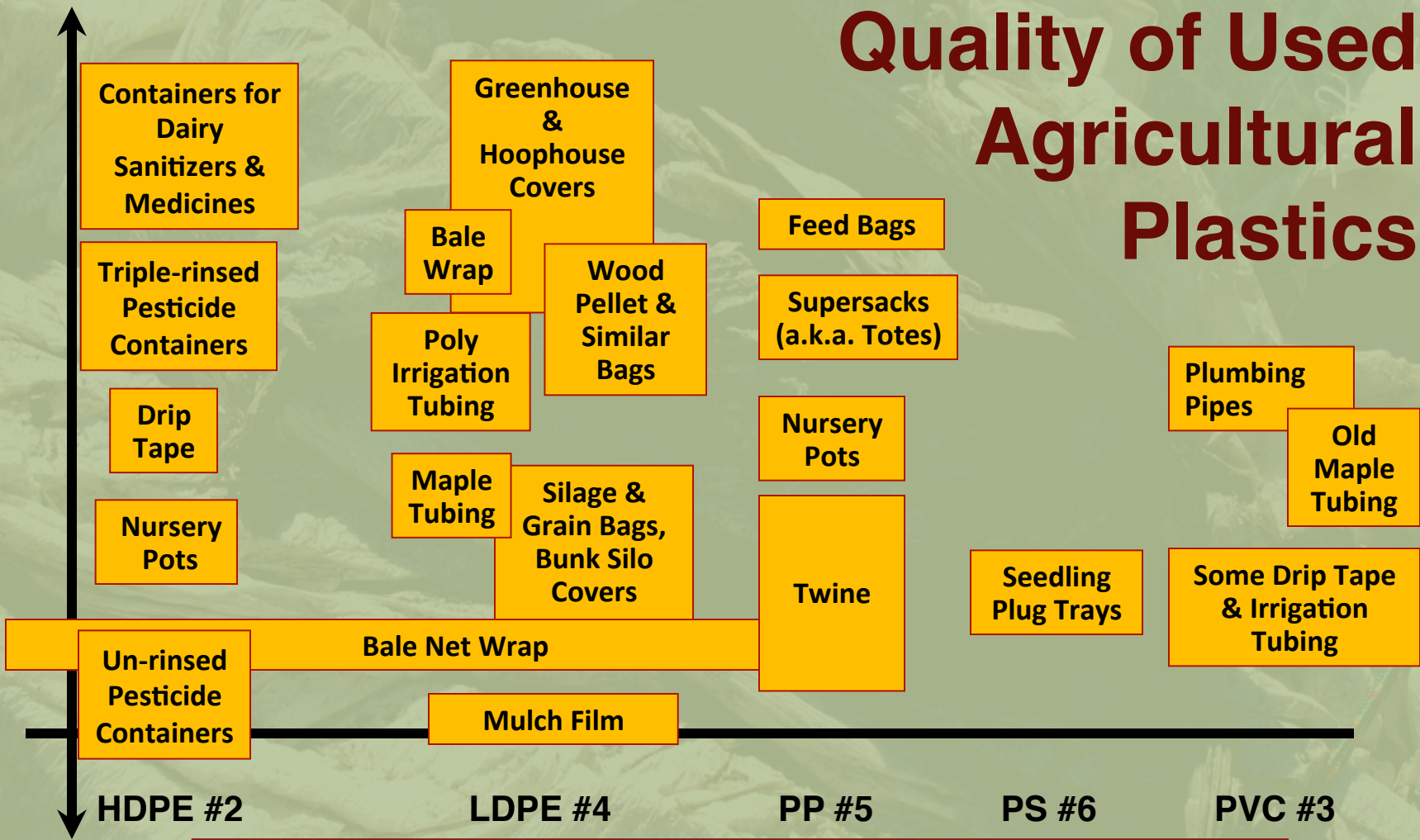
Net wrap, polytwine, boat wrap, manure pond liners, mulch film, fumigation film, maple sap tubing, etc., etc., etc.



More details in 2012 presentation <http://hdl.handle.net/1813/35999>

Resin Type & Quality of Used Agricultural Plastics

CLEANER



→ Placement on the 'clean-dirty' continuum is approximate. Quality for recycling is improved by keeping plastic clean, dry, and free of grit & gravel.

DIRTIER

Why Is Agricultural Plastics Recycling DIFFICULT?

Which challenges can be overcome?



**Dirty • Dispersed across rural landscape • Bulky
Dark colors • Possible or perceived pesticide residue
Unidentified mix of resins & additives • Soil pathogens**

Best Management Practices (BMPs)

- Keep plastic as clean and dry as possible.
- Shake out pebbles & clumps of soil.
- Roll or fold into pillow-sized bundles.
- Store off the ground, out of mud, grit, gravel.
- Separate plastic by color and type.



What not to do



Increasingly complex

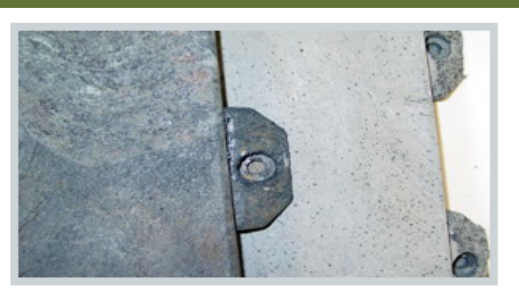
Thin films with multiple extrusion layers, each with additives and colorants for specific agronomic or horticultural purposes:

- Block UV
- Reflect sunlight
- Repel insects
- Absorb heat
- EVOH O₂ barrier
- Hold moisture
- Reinforce structure
- Prevent backwash
- Stretchability
- Stickiness
- Tensile strength
- Flexibility
- Rigidity
- Longevity
- Degradability



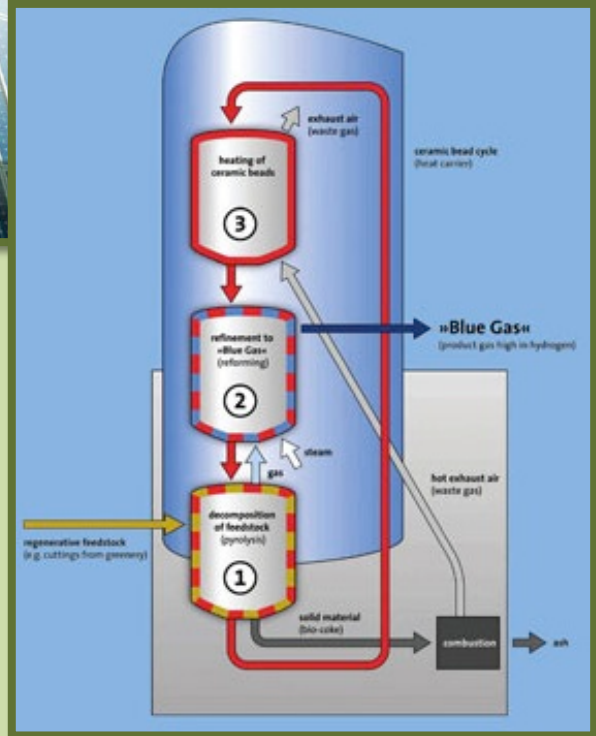
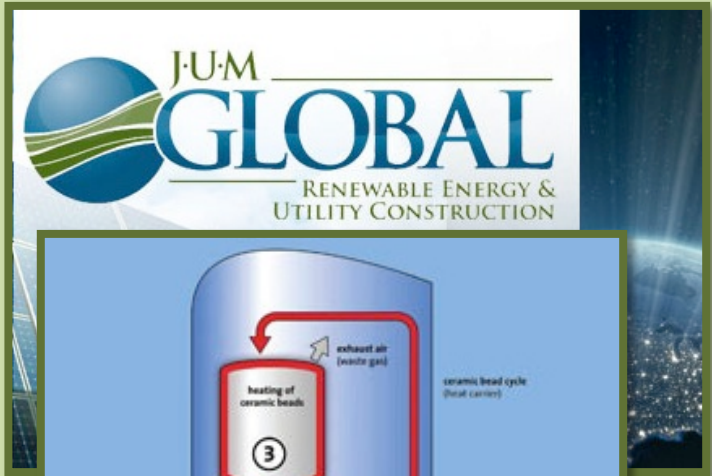
Dark colors & dirt

TERREWALKS® sidewalk pavers made from agricultural bale wrap, using thermokinetic processing



NBF Plastics plywood substitute, made with PIMS technology

Is Plastics-to-Oil a panacea for agricultural plastics recycling? What about plastic in fuel pellets?



Plastic2Oil® Converting waste plastic to ultra-clean fuel.

Home P2O® Technology Environmental Process Validation Strategic Alliances Abc

JBI Plastic2Oil® is a JBI, Inc. business solution.

Chemical residues, soil & plant pathogens, weed seeds

Late blight fungal disease affects tomato & potato crops.

A devastating outbreak in Europe in mid-1800s led to the Irish Potato Famine.

Yield losses caused by late blight and the cost of control measures are estimated at more than \$6.7 annually. The disease is a major threat to food security worldwide.”

(source: <http://www.usablight.org/>)



Photo: Dr. Meg McGrath, Cornell LI Horticultural Research and Extension Center



Mobile cleaning, baling, grinding equipment

Romall Industries Film Genie® Recycling System (prototype)

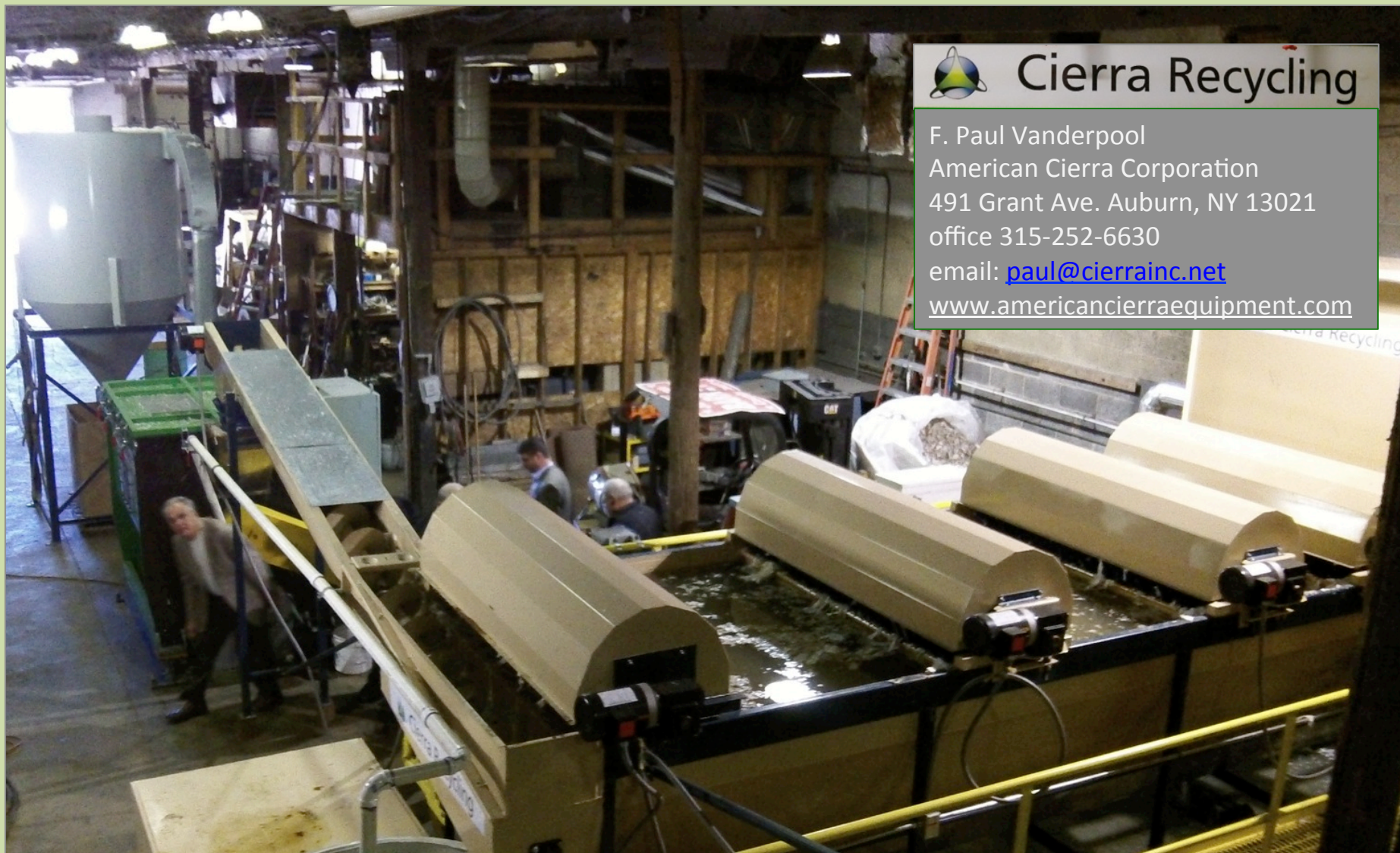
- Mobile film reclamation system
- Cleans film ON-SITE, allowing flexibility in scheduling
- Bales film for shipment ON-SITE
- Self-contained, small footprint
- Meets all California power plant restrictions
- Cleans film with proprietary non-water processes
- High volume capacity



Contact:

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Off-farm cleaning systems, disposal of residues



Cierra Recycling

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American Cierra Corporation
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Farms are not in cities

Agricultural plastics are dispersed across the rural landscape.

Collection & transportation are expensive.



Photo: Lois Levitan, RAPP

Bulky

Nursery pots & trays come in many shapes & sizes, so are tedious or impossible to stack.



Loose film takes up all the space it's given & is unwieldy to manage.



Empty containers are filled with air encased in a plastic shell.

Photos: Lois Levitan, RAPP

Extended producer responsibility

- Design for recyclability
- Identify resins & additives in agricultural plastic products
- Flag products claimed to be biodegradable/compostable
- Use standard sizes for rigid plastic containers (so they stack)
- Expand agricultural plastic manufacturers' take-back programs
- Integrate recycling collection with product delivery & distribution



AGRICULTURAL FILM

Life Cycle from 'Start' to 'Start Again'

