An Overview of Pesticide Container Volume Reduction Options

'thar's more than one way to skin a cat!'

8th Annual Working Conference on Pesticide Stewardship

Asheville, NC

February 26, 2007

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Format

- Presentation objective
- Perspective on the role of volume reduction
- Overview of Volume Reduction Equipment
  - Mobile balers
  - Mobile shredders
  - Small stationary shredders
  - Auger compactor
- Conclusions

Objective

Stimulate investigation, development and strategically targeted use of volume reduction equipment potentially applicable in a changing world of more disparity in number, size, and spatial distribution of collection sites.

Perspective

- *EPA is coming……we hope!*

- An EPA container recycling rule will mean
  - Expanded collection challenges……and ***opportunities***
  - Increased opportunities will mean ***increased competition***
  - Increased competition will ***increase innovation***
  - Increased innovation will yield ***cost saving options***
  - Cost savings will allow **increased recovery**

- EPA rule will NOT mean entitlements for ACRC or for existing collection companies

- New members or business will be earned by being “the lowest cost option”

- Even with NO EPA rule ACRC will be committed to decreasing costs
  - More pressure from members to get more for less
  - Only remaining way to reduce impact of “unlevel playing field”

Key Evaluation Criteria

- ✓ Capital cost of equipment
- ✓ Mobility/transportability
- ✓ Impact on ability to certify triple-rinsing
- ✓ Impact on labor requirements
- ✓ Compliance with worker health& safety, and environmental protection regulations
- ✓ Throughput (lbs/hr)
- ✓ Reduced material form/size and density
- ✓ Ease of consolidation & aggregation into truckload quantities
- ✓ Energy consumption
- ✓ Total volume reduction/shipping cost per pound
- ✓ Impact on material quality/value

Volume Reduction Options

- Mobile balers
  - “Tire” balers
  - VIP Australia container balers
  - Bigfoot Baler
- Shredders
  - Mobile
    - Allegheny
    - Grindzilla
  - Stationary
    - ChipPE
    - Prodeva
- Auger compactor
  - Twister

Mobile Balers

- U.S. mobile “tire” balers
  - Encore Systems, Inc. www.tirebaler.com
  - Eagle International, LLC www.eagle-equipment.com
- Australia pesticide container collection program (DrumMuster) www.drummuster.com.au
- Bigfoot Baler www.bigfootbaler.com

Mobile Tire Balers

Mobile Tire Baler Results

Mobile Tire Balers

- Capital cost ~ $55,000 - $65,000
- Haul with ¾ ton pickup
- Use 35-45 hp engines
- 120,000 pounds vertical ram pressure
- Makes 30’ x 50” x 60” bale
- Users (for tires) report only minimal maintenance needed due to small number of moving parts.

Mobile Tire Baler Test Results

- ***Thanks to cooperation of Liza Fleeson VDACS, & USAg -Sam Gibson!***
- Feed rate = 18 containers /minute (~1000/hr)
- 720 containers = ½ bale
- ½ bale = 520 lbs.
- Estimate for full bale
  - 1.33 hours
  - 1400 containers
  - 1000 lbs
- Net productivity ~ 750 lbs/hr

VIP Mobile Baler Australia DrumMUSTER Program

VIP Large Mobile Baler

VIP Large Mobile Baler

VIP Large Mobile Baler

VIP Small Mobile Baler (Australia)

VIP Mobile Baling Equipment Used for Pesticide Container Collection in Australia		
Specification	Large Baler	Smaller Baler
Capital cost- inclusive $ U.S.	~500,000	150000
Number of operating units	1	3
Application (site size)	> 6000 drums	< 6000 drums
Operating crew size	2	2
Feed method	FEL/conveyor	Hand Feed / Conveyor
Power	250 hp diesel generator	10 hp
Baler ram cycle time	1 min.	3 min
Productivity	2-3 bales/hr	1 bale per hour
Bale dimemsions (mm)	2400x1200x1200	1200x1200x1000
Bale weight	500-550 kg	300-330kg

BigFoot Baler BF-300

BigFoot Baler BF-300 (U.S.)

- Capital cost ~$33,000 including trailer
- Pull behind any pickup
- Trailer deck lowers to ground
- 20 HP Honda Engine
- 2400 psi hydraulic system
- Bale size = 40”x40”x40”
- Bale weight = 1000 -1500 lbs for ag film
- www.bigfootbaler.com

Mobile Shredding Equipment

- Mobile Document Shedders
  - Allegheny Paper Shredders www.alleghenyshredders.com
  - Vecoplan www.vecoplanLLC.com
  - Franklin Miller www.franklinmiller.com
  - Axo Shredders www.axo.cc
  - Shred-Tech www.shred-tech.com

- Mobile Grinding Systems
  - Grindzilla www.grindzilla.com

Allegheny Shredder

Allegheny Shredder

- Capital cost $200K -$225K
- 33,000 gvw cab & chassis
- 8000 lb payload
- Walking floor body to unload
- 1436 MX security grinder
- Feed with 96 gal toter or conveyor

Allegheny Shredder Tested

Thanks to Don Gilbert!

Allegheny Shredder Test

- 2.5 gallon jugs
- 1436 GX Security grinder
- Conveyor feed
- 50 hp
- Rotor speed = 150 RPM
- Pre-press (retracts when ram retracts)
- 1.5” screen
- Productivity =1032 lbs/hr

Grindzilla

Grindzilla

CONVERT THIS TO THIS

Grindzilla Mobile Grinders

- Single shaft drum shredder; low speed; high torque
- Two models ; 10 and 15 cu yd capacity
  - 10 cu yd on F-750 = $220,000
  - 5 cu yd on Kenworth = $252,000
- Conveyor belt loading
- Screens 10 mm to 50 mm
- Moving floor and side discharge

Low Volume Stationary Shredders

- Techneat chipPE

- Prodeva

Techneat chipPE (U.K.)

Techneat chipPE

- According to manufacturer
  - $9500
  - 5:1 reduction loose (10:1 compacted)
  - 5 kw motor
  - Continuous feed 15 to 20 jugs/minute
  - Shreds containers up to 2.5 gallons in size
  - Shreds= “credit card size”
  - 16 units operating in U.K.
  - www.techneat.co.uk

Prodeva, Inc.

Prodeva Model 325-S

- Capital cost~$8000
- 20 hp motor
- 2.0” screen
- 20 jugs/minute
- www.prodeva.com

Auger Compactor-Twister

Auger Compactor-Twister

- Capital cost ~ $250,000
- Hopper feed rate= 2.0 cu yd/mi ~4000 lbs/hr
- Auger compactor
- Volume reduction = 6.5:1
- 30 cu yd capacity ~7000 lbs
- www.vquip.com

Conclusions

Volume reduction is a key component of most cost effective container collection strategies, but…… ….<u>no one size fits all!</u>

Conclusions

There is <u>not</u> a lot of current knowledge and experience with many of the reduction options ……..except granulation.

Conclusions

With or without an EPA container recycling rule, <u>all interested parties</u> have a stake in volume reduction strategy development.

Conclusions

With an EPA container recycling rule, volume reduction technology is likely to advance more rapidly due to increased challenges and opportunities that motivate competition.

Conclusions

TPSA deserves a lot of credit for it's support of environmentally responsible and sustainable container management.

Conclusions

***YOU** deserve a lot of credit for your patience and kind attention to this presentation!*

Thank you!

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