US Composting Council Jan 29, 2013

Persistent Herbicides & Compost

A Recent Encounter

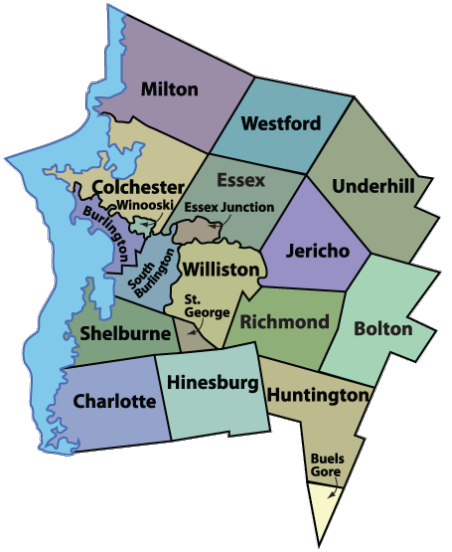
Chittenden Solid Waste District / Green Mountain Compost
Tom Moreau & Dan Goossen

The Issue

Having less than 10 parts per billion of two different persistent herbicides in our compost caused significant problems and cost to a mid-size composter

CSWD

- Located in Northwest Vermont
- Municipal Charter – public entity
- 18 municipalities in the County
- 156,000 population
- Multiple Solid Waste Programs
- $9 million annual operating budget



CSWD Facilities & Programs

FACILITIES

- Single Stream MRF
- Hazardous Waste Depot
- Special Waste Facility
- Drop-Off Centers (7)
- Compost Facility

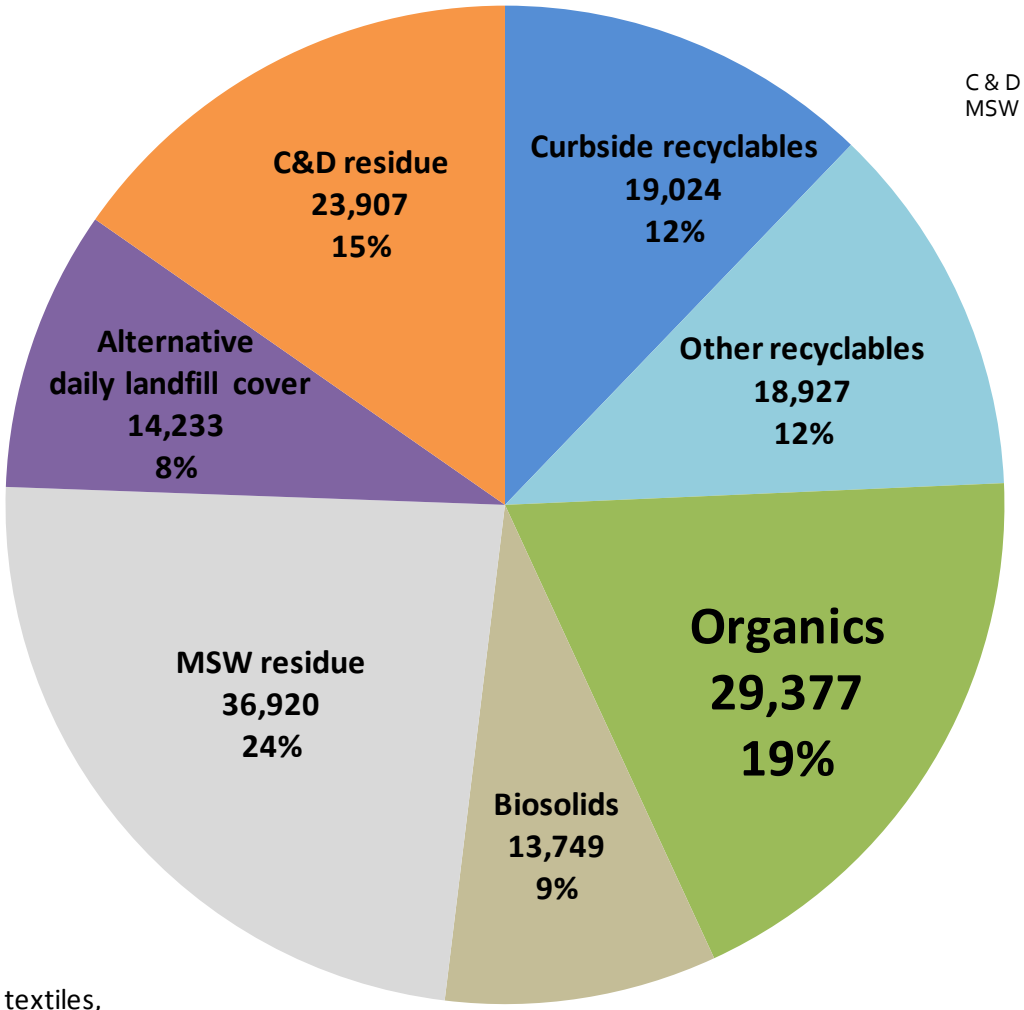
PROGRAMS

- Curbside Recycling
- Waste Reduction
- Product Stewardship
- Biosolids Management
- Public Education

COMPONENTS OF ALL CSWD WASTE DISPOSED

Estimated Percents & Tons per Year

Based on 2001 Vermont & 2010 CSWD Waste Composition Studies & FY 2012 CSWD Disposal Data



C & D = Construction and Demolition
MSW = Municipal Solid Waste

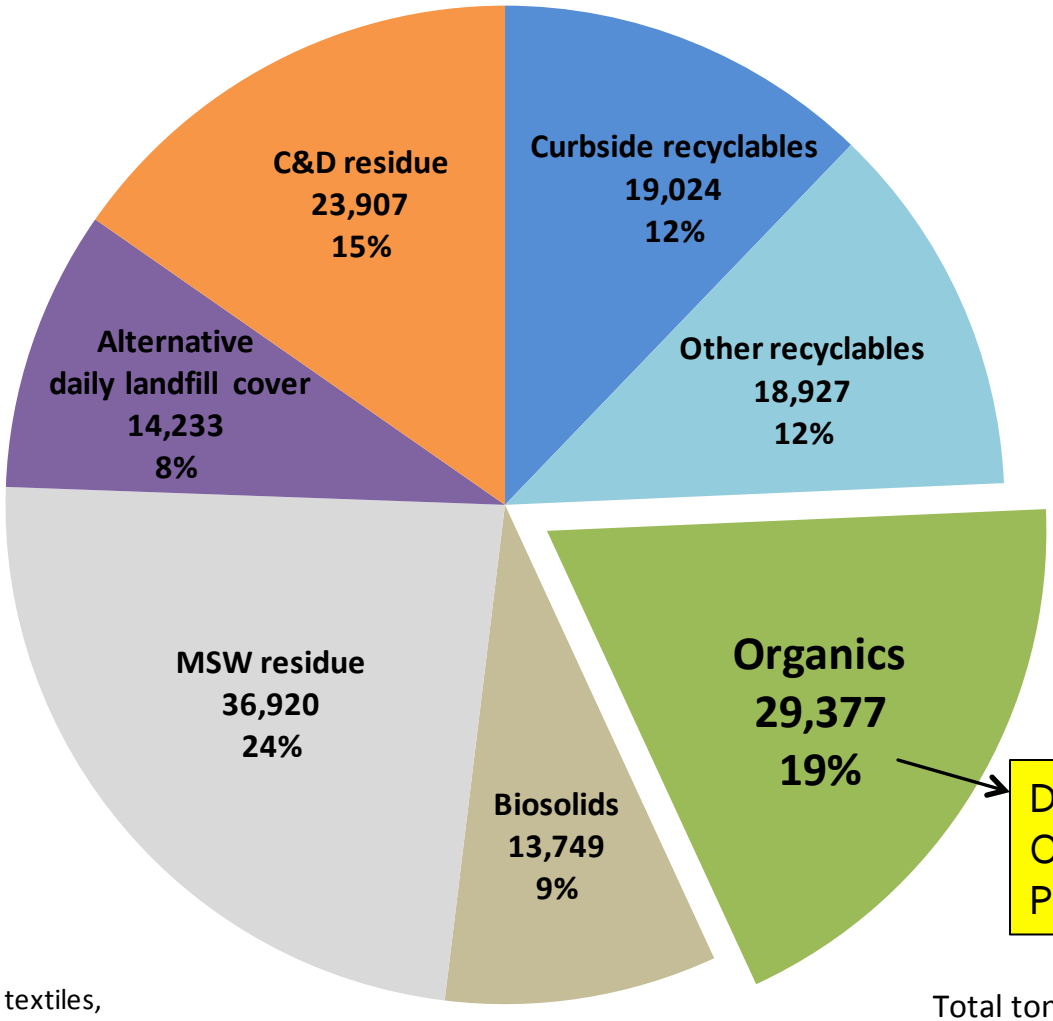
NOTE: Other recyclables includes textiles, scrap metal, clean wood, and hardcover books.

Total tons disposed = 156,138

COMPONENTS OF ALL CSWD WASTE DISPOSED

Estimated Percents & Tons per Year

Based on 2001 Vermont & 2010 CSWD Waste Composition Studies & FY 2012 CSWD Disposal Data



Divert to our Organics Processing Facility

NOTE: Other recyclables includes textiles, scrap metal, clean wood, and hardcover books.

Total tons disposed = 156,138

Vermont Act 148 (2012)

- Phased in ban of organics from landfill disposal
- 2014 – generators of more than 104 tons/yr
- 2015 – generators of more than 52 tons/yr
- 2016 – generators of more than 26 tons/yr
- 2017 – generators of more than 18 tons/yr

- 2020 – all residuals, including households

(regardless of distance)

Persistent Herbicides (1)

Picloram	Dow AgroSciences	1963
Clopyralid	Dow AgroSciences	1978
Aminopyralid	Dow AgroSciences	2005
Aminocyclopyrachlor	DuPont	2010

Persistent Herbicides (2)

Active Ingredient	Trade Names
Picloram	Tordon, Grazon, Access, Pathway
Clopyralid	Transline, Redeem R&P, Lontrel, Confront, Curtail
Aminopyralid	Milestone, Forefront, Chaparral
Aminocyclopyrachlor	Imprelis, Perspective, Viewpoint, Streamline

Persistent Herbicides (3)

- Pyridine based carboxylic acid compounds
- Act as synthetic auxins or growth regulating hormones
- Initial applications are effective at killing or repressing broadleaf plants for an entire growing season or beyond
- Can pass through mammals into manure and urine unscathed after treated grasses are eaten
- Can survive the heated and prolonged compost process intact

Persistent Herbicides (4)

- In low part per billion range, they can have a significant impact on garden plants such as beans, peas, tomatoes and many common flowers
- Symptoms include poor seed germination, twisted and stunted stems, curled leaves, reduced and miss-shaped fruit


Misshapen Su
Plants exposed
Compost
Normal
SunGold

Persistent Herbicides (5)

Impact Threshold in Compost

Picloram	5 parts per billion (ppb)
Clopyralid	10 ppb
Aminopyralid	1 ppb
Aminocyclopyrachlor	In development

Persistent Herbicides (6)

- Have very low toxicity to mammals, fish, amphibians & fowl
- Are very effective in eliminating nuisance weeds
- Are heavily relied upon by the agricultural industry

Persistent Herbicides (7)

- In conversations with USCC staff, CSWD and others, the USEPA has stated very clearly that they have no intention to ban these persistent herbicides; nor do they have any effective means to do so.

Herbicide Regulation (1)

- EPA receives its authority to register pesticides/herbicides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

Herbicide Regulation (2)

- "States are authorized to regulate pesticides under FIFRA and under state pesticide laws. States may place more restrictive requirements on pesticides than EPA. Pesticides must be registered both by EPA and the state before distribution."

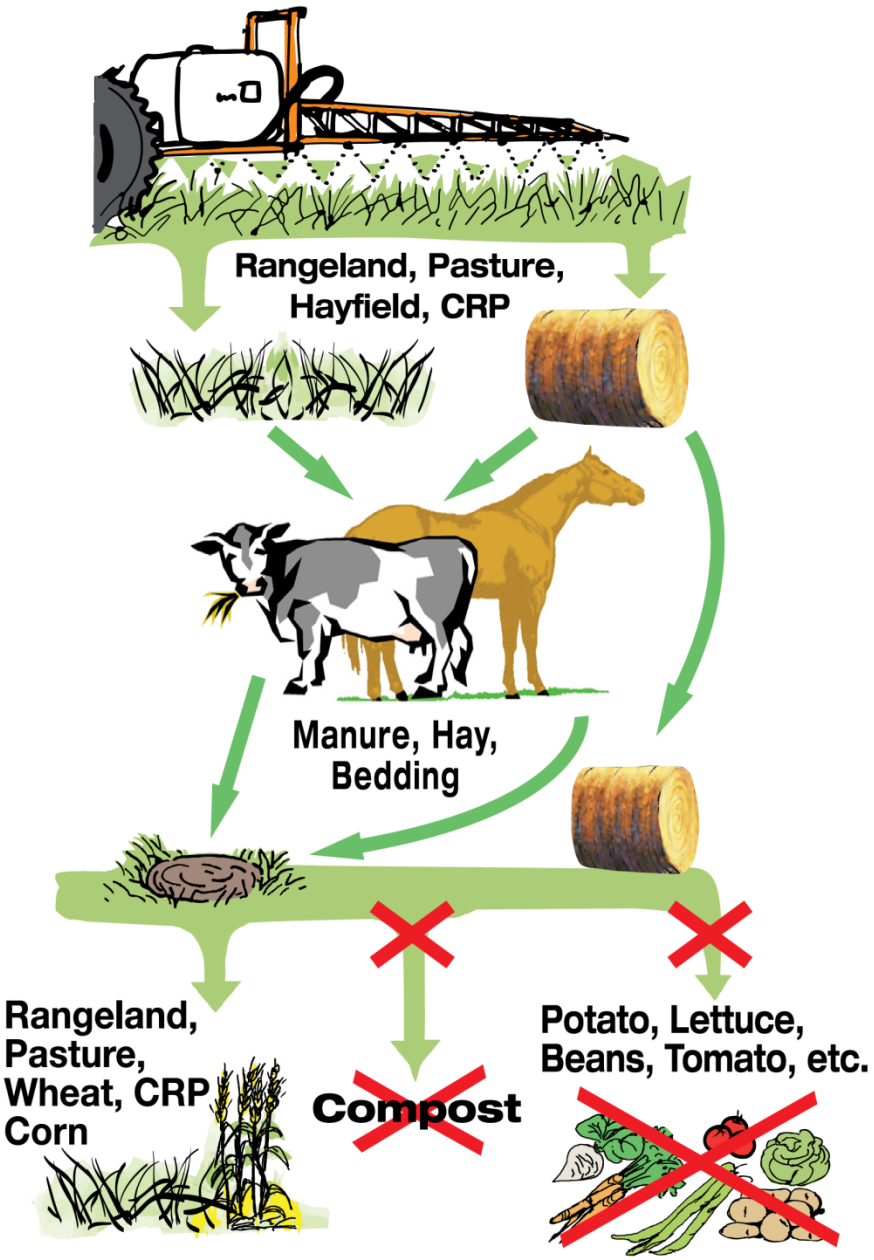
Ref: http://www.epa.gov/pesticides/regulating/index.htm

Herbicide Registration

- "Before registering a new pesticide or *new use* for a registered pesticide, EPA must first ensure that the pesticide, when used according to label directions, can be used with a reasonable certainty of no harm to human health and without posing unreasonable risks to the environment."

Ref: http://www.epa.gov/pesticides/regulating/index.htm

Forage and Manure Management



Dow AgroSciences™

Aminopyralid Use Precautions and Restrictions

- Grasses grown for hay must not be exported outside the United States.
- Manure and urine from animals consuming grass or hay treated with this product may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- Do not use hay or straw from areas treated with aminopyralid or manure from animals feeding on hay treated with aminopyralid in compost.

Grazing and Haying Restrictions on Aminopyralid-treated Grass

- Do not transfer grazing animals from areas treated with the product to areas where sensitive broadleaf crops occur without first allowing 3 days of grazing on an untreated pasture. Otherwise, urine and manure may contain enough aminopyralid to cause injury to sensitive broadleaf plants.
- Do not use treated plant residues, including hay or straw from treated areas, or manure from animals that have grazed forage or eaten hay harvested from treated areas within the previous 3 days, in compost, or mulch or mushroom spawn that will be applied to areas where commercially grown mushrooms or susceptible broadleaf plants may be grown.
- Do not spread manure from animals that have grazed or consumed forage or eaten hay from treated areas within the previous 3 days on land used for growing susceptible broadleaf crops.
- Manure from animals that have grazed forage or eaten hay harvested from treated areas within the previous 3 days may only be used on pasture grasses, grass grown for seed, and wheat and corn.
- Do not plant a broadleaf crop (including soybeans, sunflower, tobacco, vegetables, field beans, peanuts and potatoes) in fields treated with manure from animals that have grazed forage or eaten hay harvested from aminopyralid-treated areas until an adequately sensitive field bioassay is conducted to determine that the aminopyralid concentration in the soil is at a level that is not injurious to the crop to be planted.
- Do not plant a broadleaf crop in fields treated in the previous year with manure from animals that have grazed forage or eaten hay harvested from treated areas until an adequately sensitive field bioassay is conducted to determine that the aminopyralid concentration in the soil is at a level that is not injurious to the crop to be planted.
- To promote herbicide decomposition, plant residues should be evenly incorporated in the surface soil or burned. Breakdown of aminopyralid in plant residues or manure is more rapid under warm, moist soil conditions and may be enhanced by supplemental irrigation.
- Do not rotate to any crop from rangeland, permanent pasture or CRP acres within one year following treatment. Cereals and corn can be planted one year after treatment. Most broadleaf crops are more sensitive, and can require at least 2 years depending on the crop and environmental conditions. Do not plant a broadleaf crop until an adequately sensitive field bioassay shows that the level of aminopyralid or metsulfuron present in the soil will not adversely affect that broadleaf crop.

Always read and follow label directions.
R45-313-006 (05/11) DAS 010-57923-RGB

From Dow Label

- "Do not use hay or straw from areas treated with aminopyralid or manure from animals feeding on hay treated with aminopyralid in compost."

Green Mountain Compost Facility

Williston, Vermont

Capital Cost: $2.25 million

Time Frame: started permitting in April 2010,
started construction in October 2010
started operations in July 2011

Capacity: 20,700 tons per year / 83 tons per operating day

Tip Fee: $37.50/ton for food scraps

Green Mountain Compost - GMC

- Formerly Intervale Compost Products (ICP) 20 year operation – windrow technology
- Purchased by CSWD in 2008 – transfer overseen by VT Attorney General's Office
- ICP Closed in March 2011
- Moved to new aerated static pile facility and rebranded as GMC in July 2011

Green Mountain Compost - GMC

15,000 tons/year feed stocks

↓

10,000 cubic yards compost

- Member of USCC's Seal of Testing Assurance (STA)
- Every ~1,000 cubic yards, samples sent for testing
- Dual streams: Conventional and "Organic"


Raw Food Scraps

Leaf and Yard Debris

Pre-Consumer Food Processing Residuals

GMC Customers by the Numbers

BULK PRODUCTS

- 3,200 CY COMPOST IN 2012
- 5,800 CY OF ALL BULK
- MORE THAN 2,500 CUSTOMERS
- 90%+ SOLD WITHIN 25 MILES

GMC Customers by the Numbers

BAGGED PRODUCTS

- 4 PRODUCTS
- 48,000 BAGS SOLD IN FY12
- 77 RETAILERS, 2 DISTRIBUTORS
- VT, MA & NY PRIMARY MARKETS

CSWD Compost Program

- Current % of Revenues:
  - Tip Fees = 15% $37.50/ton
  - Material Sales = 85% $33.00/cubic yard
- Annual Operating Budget = $1 million

From Discovery to Full Scale Investigation and Response

- Problem with persistent herbicides was reported and identified in two gardens on June 25, 2012
- Vermont Agency of Agriculture pathologist and pesticides chief identify herbicides as culprit by that afternoon
- Sales of Bulk Compost immediately suspended

From Discovery to Full Scale Investigation and Response

- UVM Master Gardener helpline informed, pass along additional reports of probable gardens
- Coordination with Vermont Agencies of Agriculture, Natural Resources, and Department of Health
- Press Release on June 27th

From Discovery to Full Scale Investigation and Response

- Health Department Issues Warning
  - "Do Not Eat"
- Phone lines begin to ring
- Media Frenzy Begins

THE LAST

SEVEN DAYS

WEEK IN REVIEW

JULY 04-11, 2012

COMPILED BY ANDY BROMAGE & TYLER MACHADO

ATTACK OF THE KILLER COMPOST

For unsuspecting green thumbs around Vermont, "Compostgate" is turning into the horror show of the summer. What gardeners thought was nutrient-rich topsoil enhancer turned out to be an herbicide-laced menace that is wilting tomatoes and killing beans.

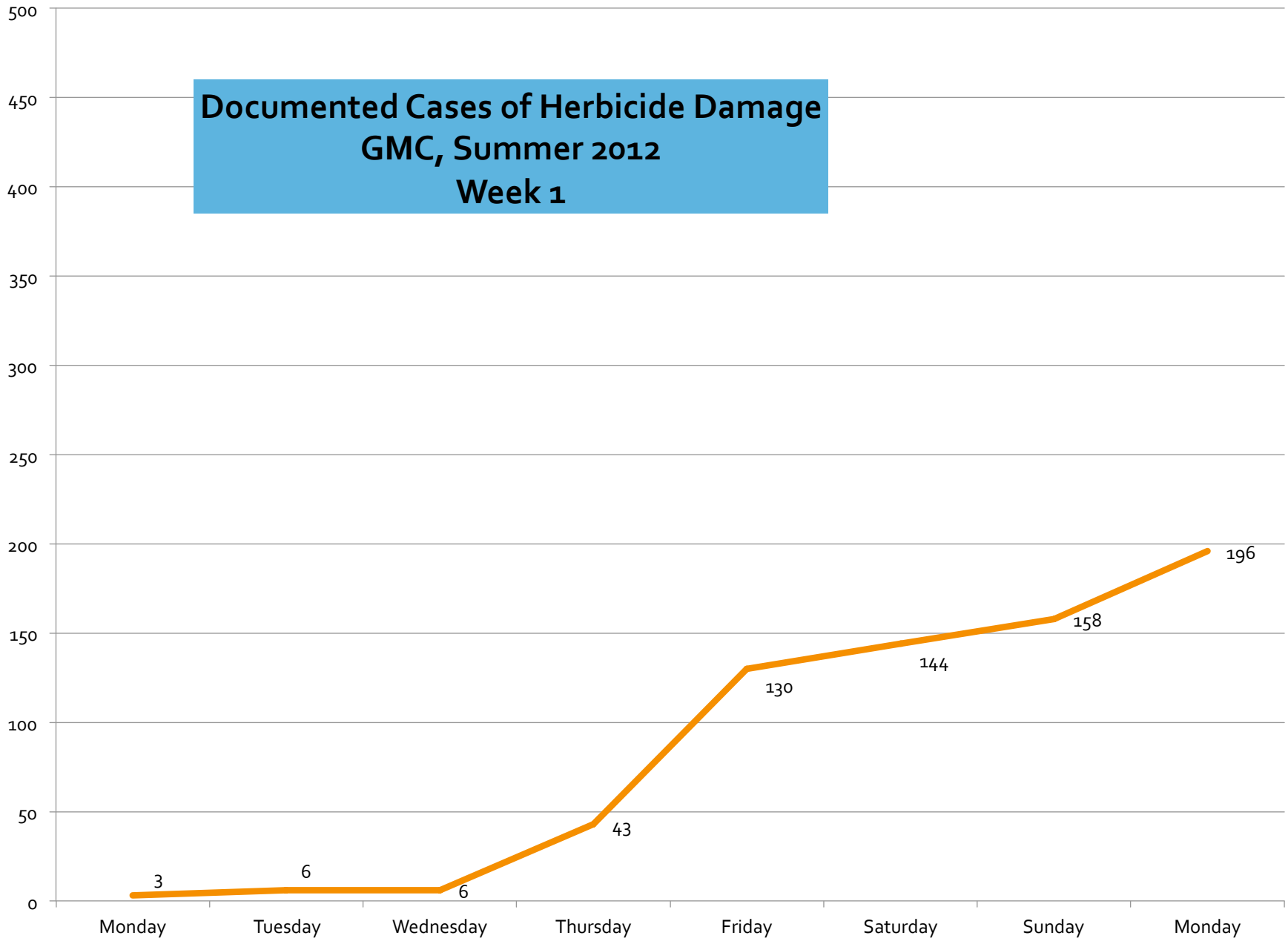
As staff writer Corin Hirsch reports on Blurt this week, Chittenden Solid Waste District — which operates and produces the tainted Green Mountain Compost — now confirms that both bulk and bagged soil and compost are contaminated with two persistent herbicides, both of which are banned in Vermont: clopyralid and picloram.

State health officials say the amount of weed killer in the compost isn't enough to harm humans, but that's little comfort to gardeners like Jason Wolstenholme of Burlington, who tells Hirsch he plans to replant his entire vegetable garden to combat the contaminants.

Tim Riddle's home garden in Winooski won Organic Garden of the Year from Gardener's Supply in 2005, but this year is full of slow-growing tomatoes with curled leaves — thanks to a bad batch of compost. CSWD general manager Tom Moreau explains that Green Mountain Compost routinely screens feedstock for heavy metals but not for compounds that are banned.

Will customers such as Wolstenholme and Riddle get compensated for their loss? All options — including monetary compensation — are still on the table, Moreau says.

MICHAEL TONN


Documented Cases of Herbicide Damage
GMC, Summer 2012
Week 1
500
450
400
350
300
250
200
150
100
50
0
3
6
6
43
130
144
158
196
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Monday

From Discovery to Full Scale Investigation and Response

- Three days after discovery, website FAQ and online reporting form for garden damage are launched

Compost & Persistent Herbicides Fact Sheet

Much of the information contained in this fact sheet has been obtained from the U.S. Environmental Protection Agency (EPA), the State of Vermont, the UVM Extension Service and other sources CSWD believes to be reliable. CSWD, however, has not independently verified the information obtained from third parties.

General Background and Information about Persistent Herbicides

- Timeline Summary of Herbicides Issue
- What are persistent herbicides?
- How long do persistent herbicides last in soil?
- Where do persistent herbicides come from and how did they get into compost?
- Why don't persistent herbicides break down in the compost process?
- It looks like people have had problems with persistent herbicides in other states for several years. Why are they just now becoming a problem in Vermont?
- What is the scope of contamination? How many gardens are affected?
- Is compost from another source safe?

Information About CSWD Action and Impact on Compost Products

- What is CSWD doing to address this problem?
- What is CSWD doing to help those whose gardens may have been impacted?
- I'm a commercial grower and I believe I have produce affected by persistent herbicides, what should I do?
- I believe my soil may be contaminated, will you come test it?
- Which compost products may be affected by persistent herbicide residue?

Information Specific to Managing Garden Impact

- How do I know if I have these persistent herbicides in my garden?
- What should I do if my garden is impacted?
- Will my garden be affected in future years? What can I do?
- Are plants and vegetables grown in soil containing persistent herbicides safe to eat?
- Is there anything I can do to save my tomato plants if they're planted in soil believed to contain persistent herbicides?
- If my plants do not having leaf curling, is my compost is ok?
- Can I replace plants that appear to have been affected by a persistent herbicide?
- Disposal options if you choose to remove plants and/or soils from your garden.

What to Compost
How to Compost
Current Products

Latest News

Backyard Compost Bin Offer

Status Report: Compost and Persistent Herbicides

Sales of Compost Products Suspended for 2013

Where Can I Take My Food Scraps and Yard Debris?

Recommendations for Accelerated Remediation of Persistent Herbicides

NOFA VT issues memo on Use of Compost (containing persistent herbicides) on Organic Farms

Where to Find Us

Green Mountain Compost™

Local. Sustainable. Wicked Good.

Formerly Intervale Compost Products

Home | Products | All About Compost | How to Compost Anywhere | About Us | Contact

Form for Reporting Abnormal Plant Growth

Reporting Potential Herbicide Exposure in Your Garden

If you purchased and applied Green Mountain Compost products on your garden this year and are seeing abnormal plant growth in those beds, we want to know about it!

The specific signs you should be looking for are extreme curling on the leaves of tomato plants, beans or legumes. These are the symptoms most commonly associated with persistent herbicide contamination. If you are experiencing plant symptoms that don't match this description, contact the UVM Plant Diagnostic clinic at 802-656-0493.

If you do not receive an automatic email reply following the submission of your entry, it may not have processed. This may be caused by very large or multiple photos being attached to your entry. If this occurs, please retry submitting your entry and emailing the photos separately.

Thank you for helping us get to the bottom of this issue. We very much appreciate your help and support. We are compiling a database of all reports so we can contact you with any updates.

Last Name *

First Name *

Name of person who purchased the compost product (if not you)

What to Compost

How to Compost

Current Products

Latest News

Backyard Compost Bin Offer

Status Report: Compost and Persistent Herbicides

Sales of Compost Products Suspended for 2013

Where Can I Take My Food Scraps and Yard Debris?

Recommendations for Accelerated Remediation of Persistent Herbicides

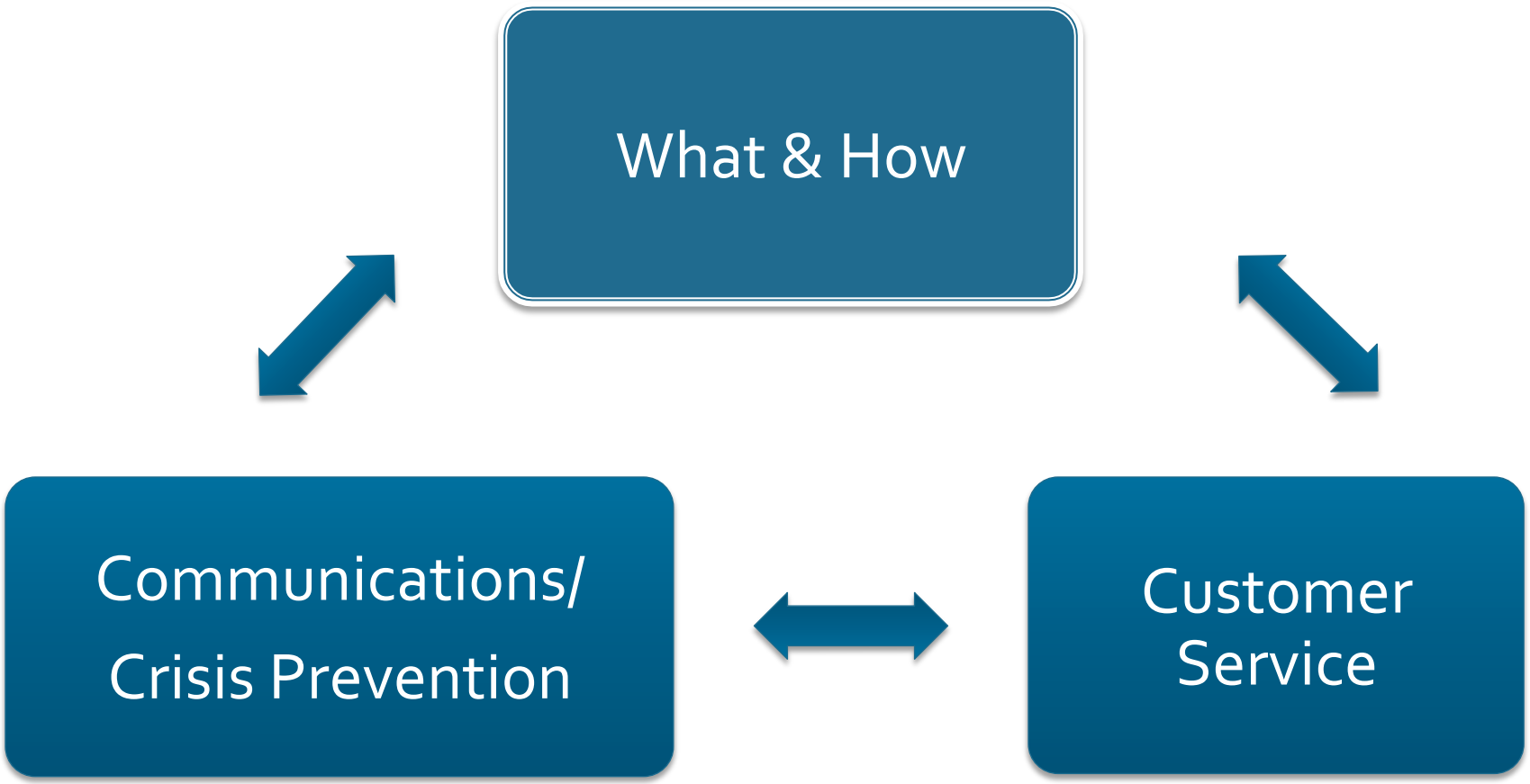
NOFA VT issues memo on Use of Compost (containing persistent herbicides) on Organic Farms

Where to Find Us

From Discovery to Full Scale Investigation and Response

- Scope still unknown during the first week
- Multipronged response is launched

Simultaneous Facets of Persistent Herbicide Response



What?

- What herbicides are we dealing with?
- What's the scope of affected products?

How?

- How did the herbicides get to our compost?
- How do they work?
- How do we get rid of them?

Communications/Crisis Prevention

Consultants Hired

- Marketing/Crisis Management

Attorneys Activated

Extensive Coordination with Affected State Agencies

District Support Staff

Customer Service

- Who's been affected?
- How do we alleviate health concerns?
- How do we confirm damage?
- How do we pay claims?

How do we alleviate health concerns?

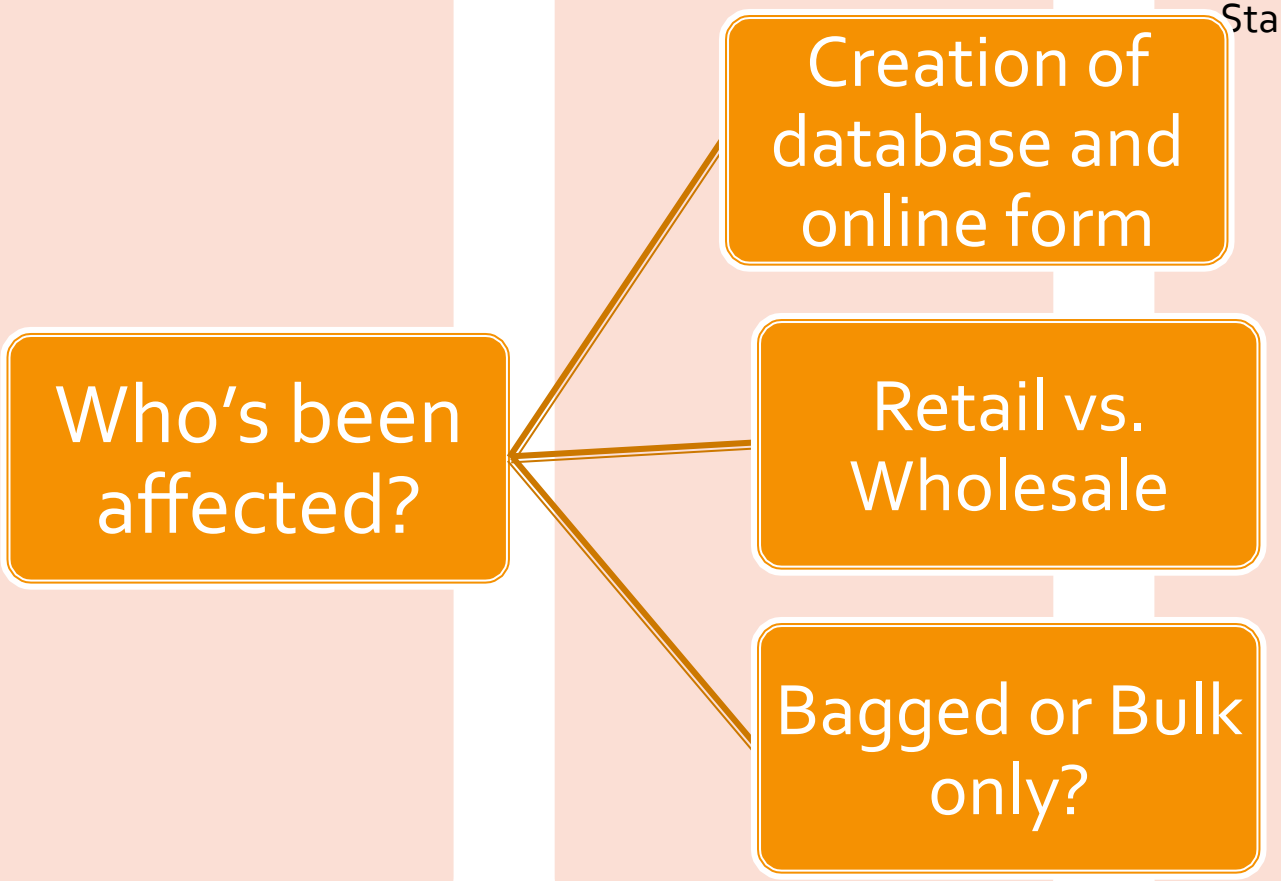
- VT Dept of Health, research

How do we confirm damage?

- Hiring of Field Technicians

How do we compensate affected gardeners?

- Verify Damage
- Proof of Purchase
- Standard Offer



How do we compensate affected gardeners?

- Verify Damage
- Proof of Purchase

Who's been affected?

- Creation of database and online form
- Retail vs. Wholesale

How do we confirm damage?

- Hiring of Field Technicians

"We don't expect that low levels of herbicides would cause consumers any harm but, as a precaution and until we know more, it makes sense to not eat food grown in what we suspect to be contaminated compost."

-VT Dept of Health

6/27/12

How do we compensate affected gardeners?

- Verify Damage
- Proof of Purchase
- Standard Offer

Who's been affected?

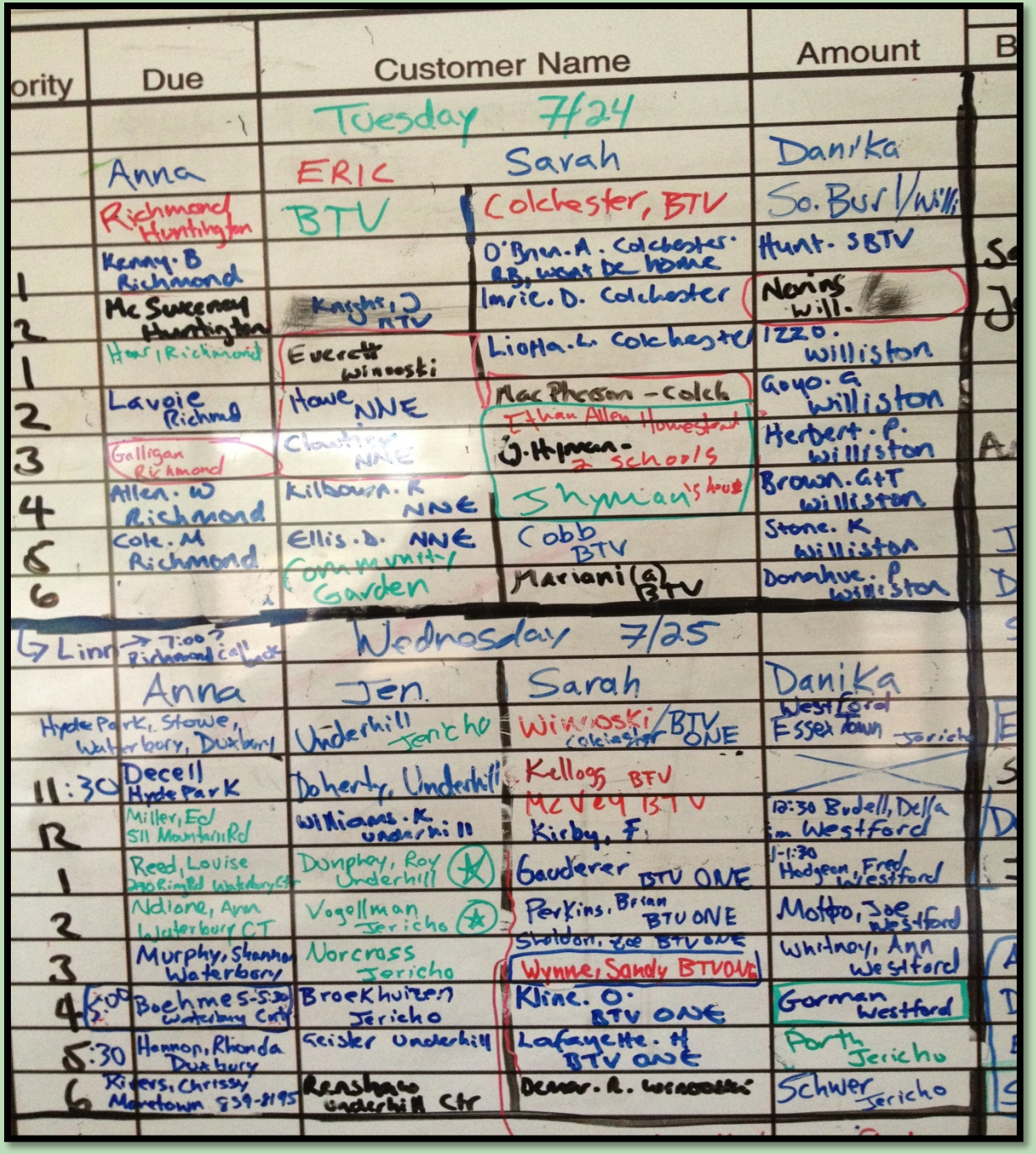
- Creation of database and online form
- Retail vs. Wholesale
- Bagged or Bulk only?

How do we alleviate health concerns?

- VT Dept of Health, research

How do we confirm damage?

Hiring of Field Technicians



ority	Due	Customer Name		Amount	B
		Tuesday 7/24			
	Anna	ERIC	Sarah	Danika	
	Richmond Huntington	BTV	Colchester, BTV	So. Bur / Willi	
	Kenny. B Richmond		O'Brien. A. Colchester. RB, would be home	Hunt. SBTV	
1	Mc Sweeney Huntington	Knight, J BTV	Imrie. D. Colchester	Nonins Will.	
2	Hour / Richmond	Everett Winooski	Liotta. L. Colchester	1220. Williston	
1	Lavoie Richmond	Howe NNE	MacPherson - Colch	Goyo. G Williston	
2			Ethan Allen Homestead		
3	Galligan Richmond	Chamberlin NNE	J. Hyman - 2 schools	Herbert. P. Williston	
4	Allen. W Richmond	Kilbourn. R NNE	Shyman's house	Brown. G+T Williston	
5	Cote. M Richmond	Ellis. D. NNE Community Garden	Cobb BTV	Stone. K Williston	
6			Mariani (a) BTV	Donahue. P Williston	
	Linn → 7:00 → Richmond call back	Wednesday 7/25			
	Anna	Jen.	Sarah	Danika	
Hyde Park, Stowe, Waterbury, Duxbury		Underhill Jericho	Winooski / BTV ONE	Westford Essex Town Jericho	
11:30	Decell Hyde Park	Doherty, Underhill	Kellogg BTV		
R	Miller, Ed 511 Mountain Rd	Williams. K Underhill	McVey BTV	12:30 Budell, Della in Westford	
1	Reed, Louise 240 Rimfield Waterbury Ctr	Dunphey, Roy Underhill	Gauderer BTV ONE	1-1:30 Hodgeon, Fred Westford	
2	Ndione, Ann Waterbury CT	Vogelman Jericho	Perkins, Brian BTV ONE	Motto, Joe Westford	
3	Murphy, Shannon Waterbury	Norcross Jericho	Sheldon, Zoe BTV ONE	Whitney, Ann Westford	
4	Boehmes-5:30 Waterbury Ctr	Broekhuizen Jericho	Wynne, Sandy BTV ONE	Gorman Westford	
5:30	Hannon, Rhonda Duxbury	Geisler Underhill	Kline. O. BTV ONE	Porth Jericho	
6	Kivers, Chrissy Moretown 839-8195	Renshaw Underhill Ctr	Lafayette. H BTV ONE	Schwer Jericho	
			Dewey. R. Winooski		

The compost detectives

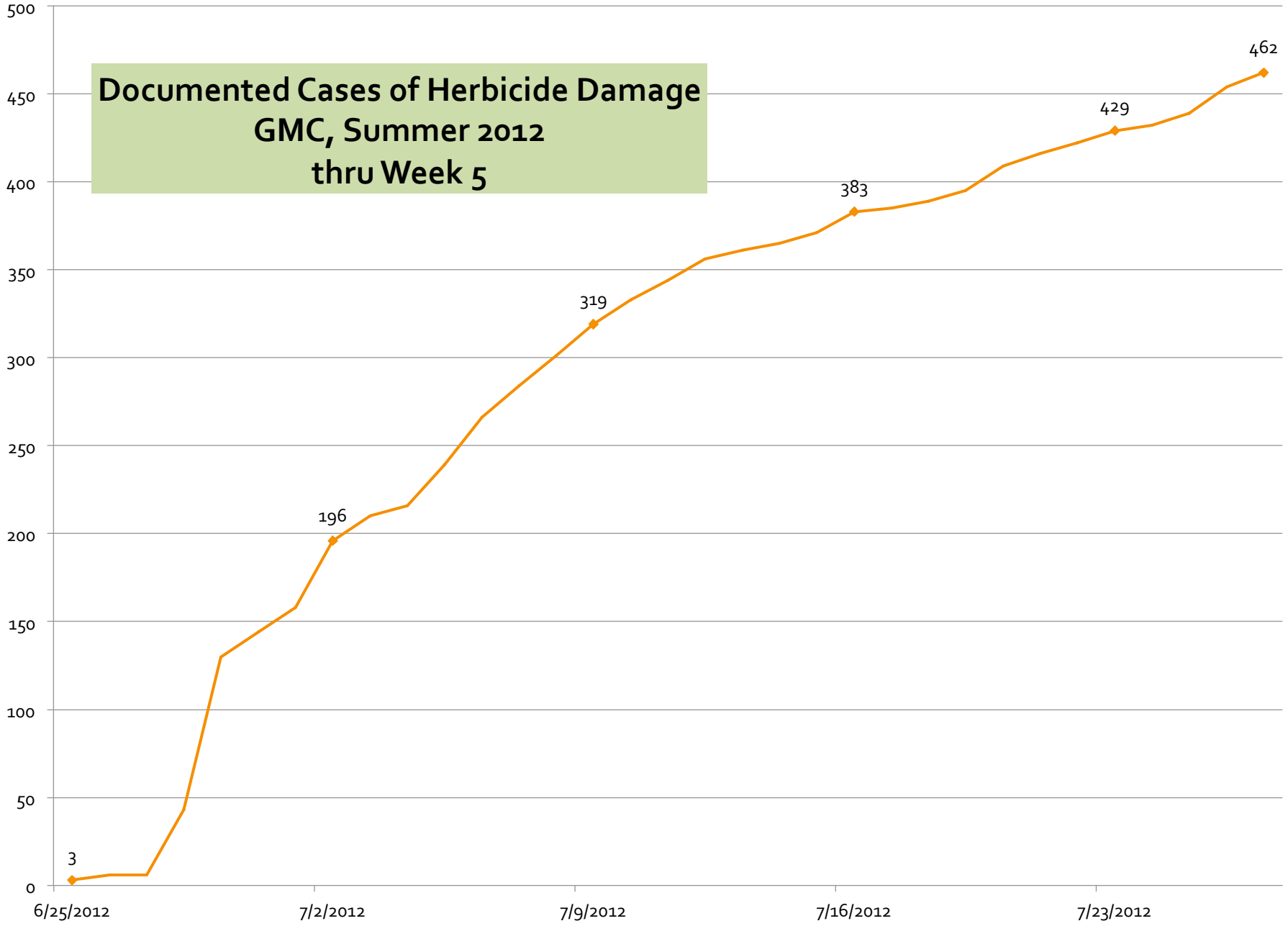
The Chittenden Solid Waste District sent Green Mountain Compost field technician Eric Bidlack (right) and marketing specialist Michele Morris (rear left) to inspect Nicole Driscoll and Keegan Reed's Burlington garden on Thursday to determine if their plant damage was caused by the herbicide contamination. EMILY MCMANAMY/FREE PRESS

Technicians compile database to help distribute money for people with contaminated gardens

MATT SUTKOSKI

ning out across much of northwestern

$934,000 compensation package for cu
tomers whose gardens were damaged


Documented Cases of Herbicide Damage
GMC, Summer 2012
thru Week 5
500
450
400
350
300
250
200
150
100
50
0
3
196
319
383
429
462
6/25/2012
7/2/2012
7/9/2012
7/16/2012
7/23/2012

Who's been affected?

- Creation of database and online form
- Retail vs. Wholesale
- Bagged or Bulk only?

How do we alleviate health concerns?

- VT Dept of Health, research

How do we confirm damage?

- Hiring of Field Technicians

How do we compensate affected gardeners?

- Verify Damage
- Proof of Purchase
- Standard Offer

The Standard Offer

- Full refund of purchase price, tax & delivery
- Compensation - $100 per cubic yard purchased
  - Seeds, Transplants
  - Time, Labor
  - Lost produce

Timeline of initial response

- June 25th – GMC learns of first complaint
- June 27th - Anatek Labs identified, sent first 26 samples of feedstocks and composts
- June 28th – Press Release, FAQ, Online Form
- July 3rd – Test results from first batch

Timeline of initial response

- July 13th – Bagged Product Buy-back Announced
- July 20th – Field Techs Deployed
- July 25th – Board Approves Assistance Package
- August 10th – First Checks Mailed to Customers

Paid Claims on Products Sold

Product	Total Sold	Paid Claims	% of Sold
Bulk Soils	5,809 cy[1]	1,293 cy	22%
Bagged Soils	36,462[2]	447 bags[3]	1.2%

[1] The amount of compost sold in 2012 was significantly reduced due to limited availability

[2] Of total 48,163 bags sold, 11,701 were returned through buy back

[3] 203 (45%) of these paid claims on bags were from one customer

Financial Impact to GMC and CSWD

- 626 Complaints received
- 510 confirmed to have verifiable damage
- 449 individual claims paid
- $450 average payout per customer

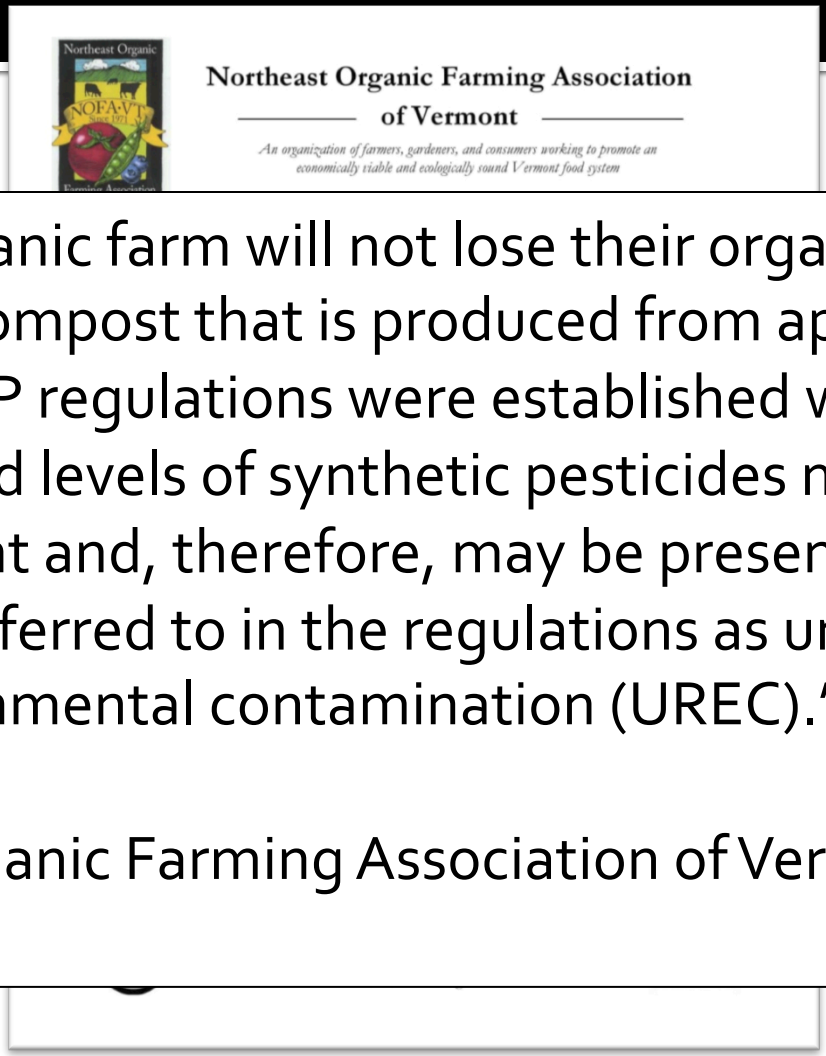
Financial Impact to GMC and CSWD

Payments to customers and resellers	$270,000
Estimate of CSWD internal cost	$372,000
Loss of value added sales	$150,000
Total **Estimated loss**	$792,000

Annual Operating Budget = $1 million


INTRODUCING
Green Mountain Compost
WWW.GREENMOUNTAINCOMPOST.COM
formerly Intervale Compost Products
Local. Sustainable.
Wicked Good.
Organic
Green Mountain Compost
COMPLETE Compost
PREMIUM PottingSoil
Seed Starter
PREMIUM Topsoil
Ask for it at your favorite hardware store, corner grocery, or garden center!
Approved for use on
Organic
farms & gardens
New location: 1042 Redmond Rd., Williston, VT 05495 • (802) 660-4949
compost@GreenMountainCompost.com

Organic Certification



"A certified organic farm will not lose their organic certification for the use of compost that is produced from approved feed stocks. The NOP regulations were established with recognitions that background levels of synthetic pesticides may be present in the environment and, therefore, may be present on organic farms. This is referred to in the regulations as unavoidable residual environmental contamination (UREC)."

- Northeast Organic Farming Association of Vermont, July, 2012

"Recommendations for Accelerated Remediation"

- Suggestions solicited from Dow, DuPont
- Wheat, Oats identified as good crops for the job
- Oats chosen as best fit due to climate
- Oat kits made available to all with damage

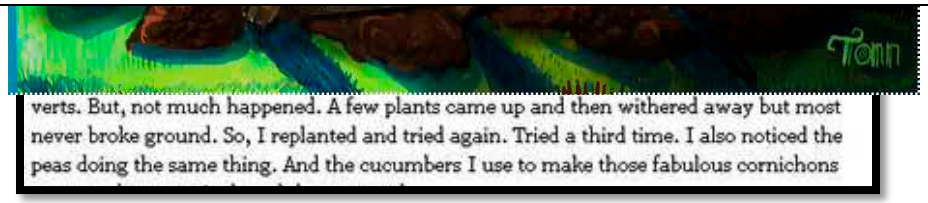
2012, Longest Summer Ever?

"Right from the start CSWD took responsibility, kept me informed, followed through on each promise made, took responsibility for the problem, and showed genuine concern. Their customer service was exemplary.

Sure, they had a problem – a huge one. But they also showed compassion for the difficulties they caused, and they were honorable in their dealing with me. That is great customer service. Thank you, CSWD."

-Peter Post

The E Word, Boston Globe, September 18, 2012



Expressed Appreciation

"Many thanks for the flow of information on your compost problem. Your attention to the problems and actions taken is outstanding and very commendable. In addition, I thank you for all the education. I will be your customer again next spring."

"Your information page has been very concise and complete.... You produce a superior product, and I look forward to getting another truckload when this is all said and done. Thank you."

Expressed Appreciation

"Thank you Green Mountain Compost! Your support and care for your customers with affected gardens has been beyond expectations"

"I just wanted to take a moment to commend you and your organization for being so forthright and upfront on how you handled this unfortunate situation. I especially appreciate the proactive approach you took in researching the problem, communicating your findings and then offering what I consider a fair settlement. It is always nice to see an organization willing to accept responsibility. I have complete confidence in continuing to use your product in the future."

Back to Tom….

Testing: Chemical (1)

- Round 1 – CSWD Sent 84 samples sent to Anatek
  - Clopyralid results valid, picloram & aminopyralid suspect
- Round 2 – VT Agency of Agriculture sent 68 samples to Carbon Dynamics lab, paid for by Dow Agrosciences
  - Their results for aminocyclopyrachlor were later discredited
- Round 3 – VT Agency of Agriculture sent 9 "split" samples to seven different labs
  - EPA yet to report
  - Aminopyralid believed to be major the culprit at CSWD

Testing: Chemical (2)

- Round 4
  - Dow agrees to retest the 68 samples for the Vermont Agency of Agriculture originally sent to Carbon Dynamics. Results to be used for "trace back" analysis.

  - Dow agrees to test new samples from CSWD. Results for two samples of compost made without horse manure still indicate a slight problem.

    Dow now testing all feedstocks to Green Mountain Compost (11 samples) – We are awaiting the results.

Testing – Going Forward (1)

- Fred Michel of OSU running growth trials on the two samples with no horse manure
- CSWD has collected samples from compost and area gardens for new set of growth trials to start in February at our own greenhouse.

Testing – Going Forward (2)

- DuPont has made their test method available – 3 commercial labs offering to test for DuPont's aminocyclopyrachlor
- Dow working on making their test methods available – possibly one procedure for 3 compounds

CSWD Current Efforts:

- Working with Manufactures, USEPA, State Agencies and USCC on prevention
- Patching together funding for deficit – CSWD filed lawsuit on our insurance company
- Obtaining needed information from the herbicide industry
- Bringing the herbicide industry up to speed on the composting industry

VT Agency of Ag, Dow, EPA

- Conducting trace back analysis to find path of entry into CSWD compost
- How to prevent in future?

Thank You!

tmoreau@cswd.net

dan@greenmountaincompost.com

US Composting Council Jan 29, 2013

Persistent Herbicides & Compost

Suggested Improvements

Chittenden Solid Waste District / Green Mountain Compost
Tom Moreau & Dan Goossen

Suggested Points for Progress (1)

1. Testing Methods:
   a. Consistent, reliable, proof of proficiency
   b. Suitable detection limits for compost and feedstocks
   c. Reasonable cost, perhaps subsidized

2. Establish dose response or maximum amount allowed in compost – for each compound and additive of multiple agents

Suggested Points for Progress (2)

3. Strengthen label requirement on danger to compost and insure that label information is passed on to all downstream users

4. Publish degradation rates of persistent herbicides in compost and impacted soils

5. Create a cradle to grave product-use documentation for persistent herbicides

Suggested Points for Progress (3)

7. Create a national incident registry for all reported misuse or unintended contamination of feedstocks by persistent herbicides

8. Ban internet sale of persistent herbicides to non-licensed applicators

9. Insist that all applicators carry liability insurance

Suggested Points for Progress (4)

10. Establish a trace back analysis system to determine source when misuse occurs or unintended contamination is found in compost
    a. Potential of $ via product stewardship fee on product sale
11. Establish a mitigation fund available to composters whose products are exposed to persistent herbicides at impacting levels
    a. Potential of $ via product stewardship fee on product sale

Suggested Points for Progress (5)

12. Consider restrictions on use of crop exposed to persistent herbicides
    a. State of Montana
    b. United Kingdom

13. Eventual requirement that all persistent herbicides be broken down to non harmful levels by the composting process

Batch Recipe – no horse manure

- 3.1 cy reclaimed wood chips (for optimum porosity)
- 2.0 cy food scraps
- 0.28 cy chicken manure
- 9.2 cy leaf and yard waste
- 1.0 cy coffee chaff and burlap
- ~217 gallons water

Each batch takes about 15 minutes to process

Batch Recipe – with horse manure

- 3 cy reclaimed wood chips (for optimum porosity)
- 2 cy food scraps
- 3 cy horse manure
- 9 cy leaf and yard waste
- 1 cy coffee chaff and burlap
- ~217 gallons water

Each batch takes about 15 minutes to process

Incoming Feedstocks (1)

- **Food Scraps**: Haulers place directly into covered mixing bay (Tip fee paid to CSWD)
- **Leaves & Yard waste**: General public and Landscapers place into outside bunkers (no tip fee)
- **Horse or Chicken Manure**: Placed directly into covered storage bay (CSWD pays transportation)
- **Wood Chips**: Generators unload in outside bunker (CSWD pays for most wood chips)

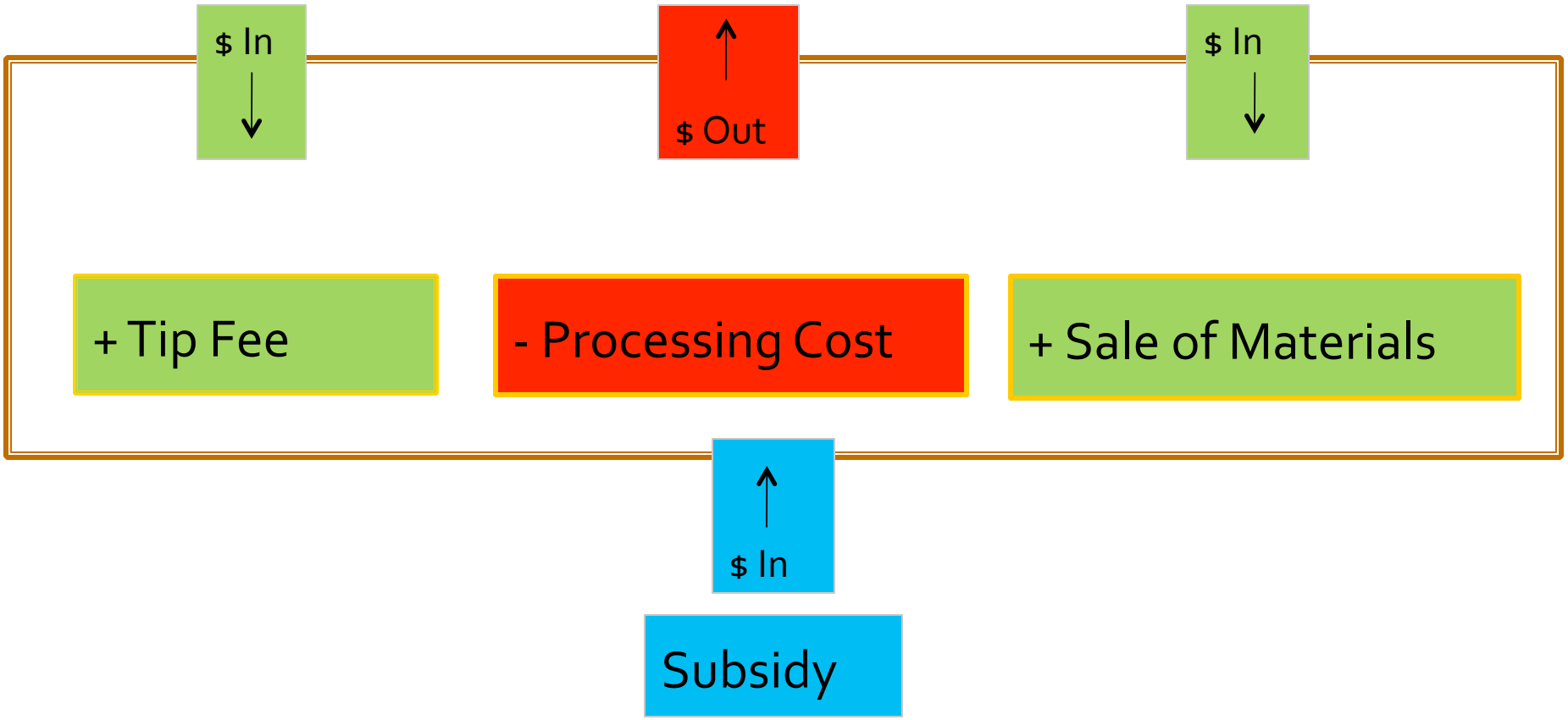
Incoming Feedstocks (2)

- **Other Material**
  - Coffee chaff with burlap bags – stored outside, tip fee
  - Beer making grains – put inside mixing bay, tip fee
  - Ice cream Ingredients - put inside mixing bay, tip fee

Desired Recipe Results

- Carbon to Nitrogen Ratio ~ 25 to 35: 1
- Moisture Content: ~ 60 to 65%
- Bulk Density: ~1,000 to 1,100 lbs/cy
- Thoroughly mixed

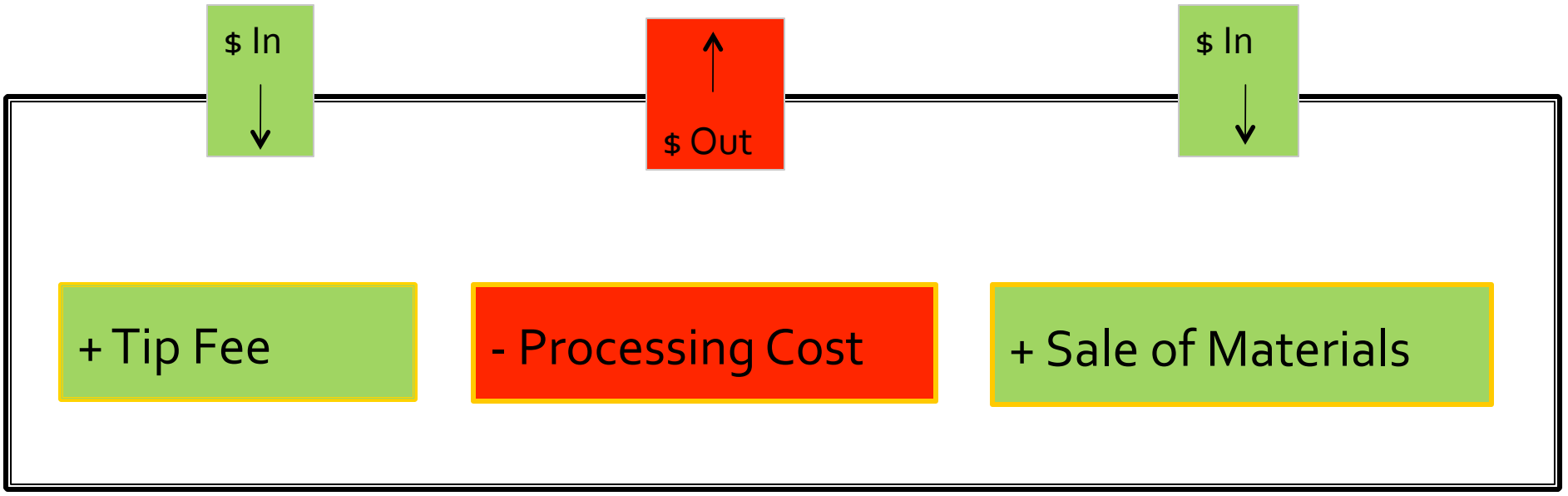
Processing Net Cost =



(Processing Cost includes Debt Service)

Processing Net Cost

=



(Processing Cost includes Debt Service)

Income > Expense = surplus or profit

Income < Expense = deficit or loss

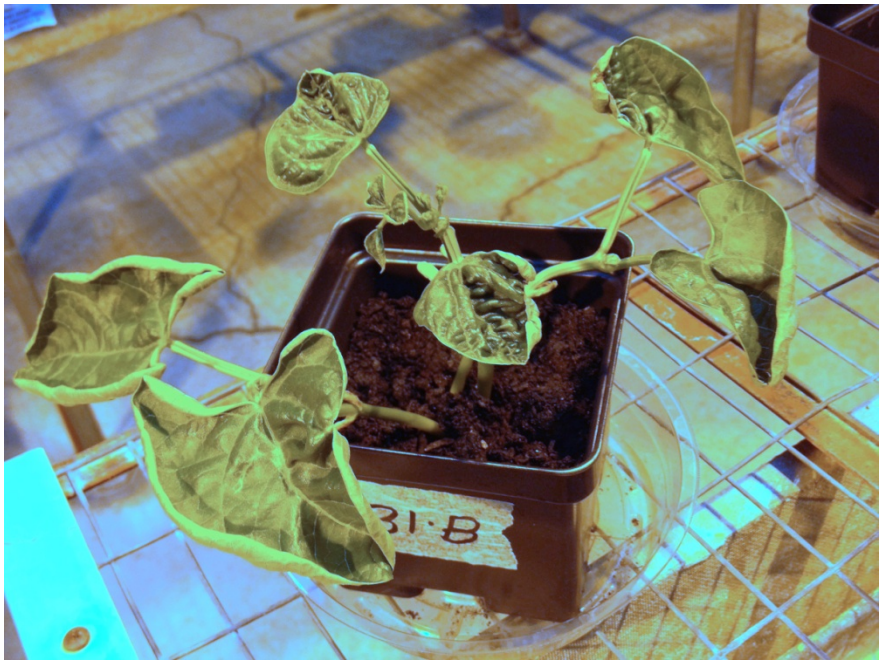

DANGER
31-B
31-B
31-T
31-T
31-P
31-P


DANGER
DANGER

Bioassays – Growth Trials

Early Indicators of Persistent Herbicides

Control Bean Plants at 19 days



UVM-31, L.Colasurdo at 19 days

Bioassays – Growth Trials

Early Indicators of Persistent Herbicides

Control Bean Plants at 19 days

UVM-32, M.Prescott at 19 days