

# **Agricultural Plastics Recycling in New York State**

September 1, 2013 – March 31, 2016

Final Report

NYS Department of Environmental Conservation (DEC) Contract # C009124

NYS Recycling Agricultural Plastics Program (RAPP)

Cornell Waste Management Institute (CWMI)

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## **Overview of RAPP activities across the State**

RAPP was challenged to increase the agricultural plastics recycling rate in New York to 10% or greater. Over 2 million pounds of used ag plastics being recycled in 2 ½ years. The initial 8 months were below the 10% level. The increase has come with a number of challenges, including the low cost of virgin plastics resulting in the collapse of many plastics recycling markets.

However, RAPP's efforts in developing markets are paying off. There has been an increase in domestic processors handling agricultural plastics and an apparent increase in overseas markets. Overseas markets had been relatively unaware of many ag plastics. The market situation did result in the loss of markets for low quality materials like used horticultural mulch film, the cost of trucking was exceeding the market value. The drop in the market price caused one private business in Central NY to suspend collection of bale wrap. Yet market options for better quality material like boat wrap and greenhouse film improved.

RAPP continues to work with the network of outreach educators, generally Cornell Cooperative Extension (CCE) County Associations, in their roles of recruiting plastic recycling participants, maintaining contact with current participants and providing training and education in preparing plastic for efficient recycling. Outreach educators have been incredibly important in teaching producers best management practices for recycling. When producers understand expectations and realize they are not difficult to achieve, the quality of what is collected improved.

Delaware and Madison Counties Departments of Solid Waste, continue to manage their own agricultural plastics collection and recycling programs with support from RAPP for education and marketing, as needed. The participation of local Solid Waste is proving essential for the sustainability of agricultural plastics recycling. This can be part of a team such as the partnership in Otsego County involving Solid Waste, the Soil and Water Conservation District, Otsego County Conservation Association and Casella Resource Solutions. Delaware County has exceeded a 50% recycling rate for used agricultural plastics in the county. This is an outstanding accomplishment in a short time.

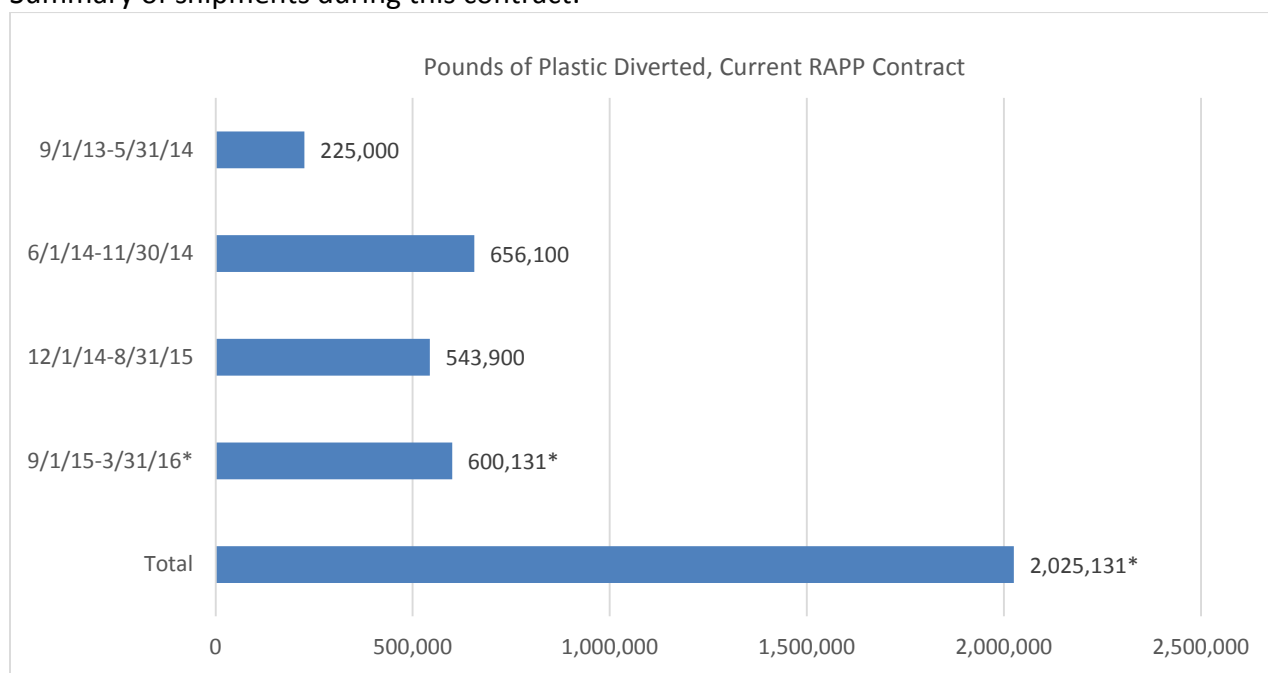
Ontario County CCE and Planning Department formally joined the RAPP effort. CCE hired a summer intern to survey area farms for quantities of plastic used and assess interest in recycling agricultural and marina plastics – interest is high. This is a public/private effort with Casella Resource Solutions proposing to collect and market the materials. The private partnerships take time, changes in collection must also make sound business sense. In Otsego County, Casella has supported collections of ag plastics, significantly motivated by the difficulties of handling agricultural films in their compaction trucks.

During this contract period, September 1, 2013 through March 31, 2016, just over 2 million pounds of ag plastics from NY sources were diverted to markets. These have been delivered in the following quantities:

- 815,631 pounds to Brooklyn, NY, for processing into garbage bags and an additional 82,600 pounds were forwarded to them by NBF Plastics in Auburn, NY.

- 157,000 pounds of mulch film were shipped to Delta Plastics in Little Rock, AR, to be made into industrial-quality garbage bags.
- 279,500 pounds were delivered to NBF Plastics for processing into plastic lumber or forwarded to other markets. 11,000 lbs. of Super Sacks® were taken by NBF for reuse.
- 156,000 pounds were taken by TAP Industries, Malone, NY, with intent of being processed into plastic pellets.
- 40,000 pounds were shipped by Madison County Solid Waste to JUM Global, Jacksonville, FL, for plastics to fuel processing. Madison County also shipped 120,000 lbs. to Prima-America in Groveton, NH, for plastics to fuel processing.
- 110,600 pounds were shipped to other markets.
- 336,000+ pounds have been diverted and baled in preparation for market.

Summary of shipments during this contract:



\*Includes 336,000 lbs. of baled material ready for market

**State Coordination to build infrastructure:**

State Program Work Team (PWT) meetings: Cornell Cooperative Extension assisted RAPP with funding for focus groups to help generate interest in recycling of agricultural plastics. Three PWT meetings were held, one in Malone focusing on Franklin, Clinton and Essex Counties, one in Hamden focusing on Delaware County efforts, and one in Kingston focusing on the lower Hudson Valley counties. These meetings yielded a great deal of interest with new counties in recycling ag plastics. In the North Country, a plan emerged for moving bales to a local recycler, TAP Industries in Malone and Plattsburgh. This plan was accomplished.

Considerable time has been put into supporting collection efforts through SWCDs, Solid Waste and Recycling Authorities and private companies. Five mobile BigFoot balers were used in contract and neighboring counties. During the winter of 2015, Lewis County SWCD assumed the cooperator

agreement for the Jefferson County baler and Cornell Cooperative Extension of Wyoming County assumed the cooperator agreement for the Wyoming County baler.

Increased interaction with private industry is proving beneficial. Ontario County Planning Department has written agricultural plastics recycling into their county waste management plan and has engaged Casella Resource Solutions to develop a plan for collecting, baling and marketing ag plastics. Hopefully this will become a regional effort. As mentioned, ongoing efforts in the North Country have resulted in 156,000 lbs. of plastic being moved to TAP Industries for processing. TAP Industries received a Regional Economic Development Council (REDC) grant in December 2014 to help complete their processing line.

In the past, moving bales to storage and/or market locations were carried out largely with RAPP funding. As this is not financially sustainable, RAPP has been meeting with Solid Waste and Recycling Authorities regarding the acceptance, storage and recycling of agricultural plastics. As we establish storage locations in each part of the state, farmers, marina operators and other generators can self-convey plastics (baled, in Super Sacks®, loose or in some other manner) to these designated locations. Delaware and Madison Counties have fully adopted this approach. In Otsego County SWCD notifies Casella where baled material is located and Casella trucks pick up bales as it fits their schedule.

Work has been ongoing to identify alternative methods to move baled plastics to markets. Discussions with solid waste authorities and private haulers have identified several alternative methods of collection and transport of ag plastics for recycling. St. Lawrence County Solid Waste indicated that they have transportable compaction containers that could be used for transporting material straight to market without baling. Wheelock Disposal, Winfield, NY, supplied 40-yard roll-off containers, with the ability to move up to 24,000 lbs. of plastic at one time for ag plastics delivery to NBF Plastics. A walking floor tractor-trailer was also successfully used to load bales on a farm that had no loading dock. Casella Resource Solutions is also investigating methods of collection.

RAPP has assisted **Madison County** Department of Solid Waste with their interest to build a plastics-to-fuel facility to process agricultural and other plastics. RAPP has introduced most of the potential businesses to Madison County. A Regional Economic Development Council grant proposal to attract a company was unsuccessful, however 5 companies submitted proposals to a recent RFP. Review of these proposals is underway.

Meetings with **Otsego County** Solid Waste, SWCD, Otsego County Conservation Association, and Casella Resource Solutions resulted in four collections, two in the spring and two in the fall of 2015. ~14,000 lbs. of agricultural plastic were brought in, largely from commercial producers but also homeowners with wood pellet bags. Additional collections were held in May of 2016. For smaller producers, Otsego County would like to shift from baling on farm to receiving at collection locations.

At a review of **Delaware County** Solid Waste's agricultural plastics collections program using Super Sacks® and baling, it was found that the ag plastics collected to date have been reasonably clean and sorted properly by the farms. At the PWT meeting in April 2015, a tour of the new MRF showed that the use of Super Sacks® has proven useful for other recyclables. To date, Delaware County has recycled 98,630 lbs. of agricultural plastics. Some of these funds are coming back into the RAPP Program. Their recycling rate for used ag plastics has exceeded 50%.

RAPP met with Solid Waste Divisions of **Chautauqua and Cattaraugus Counties** as well as SWCD and CCE staff from both counties that are interested in participating. Both counties are assessing their resources and potential for Solid Waste to divert ag plastics to recycling. Cattaraugus County Solid Waste offered two sites for collection and baling of ag plastics. Extension is working to educate farmers and a bale of Super Sacks® was left with SWCD and Extension for distribution. Agreement was subsequently reached with Chautauqua County SWCD to receive the Washington County baler and

increase collection of ag plastics in the county. The cooperators agreement was signed in the winter 2015. To date, limited plastic collection and baling has occurred, a significant number of farms have committed to participating.

Meetings with recyclers have had very mixed results. RAPP met with Southern Tier Recycling (Taylor Garbage) on 11/11/14. They were interested in recycling agricultural plastics but decided against it at the present time due to the low cost of virgin plastics depressing the recyclable plastics market. Great Lakes Recycling, North Tonawanda, is handling film plastics and would assist with marketing and possibly facilitating pickup of baled plastics from farms in Western NY. Ultra-Poly, a plastics recycling company in Pennsylvania, ran test runs to process greenhouse films with coordination from RAPP. They liked it and subsequently have started accepting and processing this material.

### **RAPP Educational Activities**

A dedicated RAPP website is located at <http://www.recycleagplastics.css.cals.cornell.edu/>. Some of the postings are listed below:

- Educational materials can be found at <http://www.recycleagplastics.css.cals.cornell.edu/agplastics-2.htm>, including short “fact sheets” for best management practices on preparing and storing plastic for collection/baling. A small number of these have been printed and laminated as double-sided posters and have been distributed at events.
- A map showing baling activity and locations, Super Sack® locations and locations where RAPP education is occurring is located at <http://compost.css.cornell.edu/RAPPmaps.html>.
- The BigFoot Baler Instructional video (English and Spanish versions), also available online, and the Baler Maintenance Manual

In both August 2014 and 2015, RAPP had displays at Empire Farm Days, a three-day event held annually in Seneca Falls, NY. The booth attracted several hundred visitors, approximately 50 people had specific follow up requests related to recycling their plastics. A significant number of farmers expressed interest in the proposal to collect and divert ag plastics from the Ontario County landfill.

In September 2014, Broome County CCE invited RAPP to speak at the Broome County Local Government Training. A 45-minute presentation titled “Agricultural Waste: Role of Farm and Municipality” was presented to 62 attendees, who were very interested in agricultural plastics recycling.

Additional outreach was conveyed through displays at the annual NYSAR3 conference and trade show in Cooperstown, Novembers of 2013-2015. This is a good opportunity to interact with solid waste personnel, recycling coordinators and private industry.

In March of 2016, RAPP presented “Agricultural Plastics Recycling has Potential” to the USDA Northeast Pasture Consortium Research Advisory Committee and the Maine State Grazing Association Conference. Over 150 people attended these conferences and several States may take an interest in recycling their agricultural plastics.

### **RAPP Plastic Activities**

CWMI has directly coordinated plastics collections in Central NY and is actively trying to find solid waste and recycling partners. RAPP also assists with marketing ag plastics that have been collected throughout NY both with direct partners and non-affiliated groups.

In lieu of local partners, RAPP has coordinated baling and collection on a limited number of farms across 7 counties in Central NY (Broome, Cayuga, Cortland, Schuyler, Seneca, Tioga and Tompkins).

RAPP also brought the mobile baler several times to Owasco Marine in Auburn, NY, where employees have baled over 20,000 pounds of boat wrap. With Tompkins County SWCD not renewing the baler cooperator agreement in September 2015, CWMI has had to greatly taper collections in Central NY. More of the plastics are now collected using Super Sacks® at Farm Services, part of Cornell University Agricultural Experiment Station. 27,000 lbs. of baled plastics were moved from Central NY to NBF Plastics in Auburn.

Also in Central NY, RAPP assists with other collection efforts, largely with marketing. Chemung County SWCD owns a mobile baler. In 2015, RAPP made arrangements for 84,400 lbs. of baled ag plastics from Chemung County to move to a market in Brooklyn. As of March 31, 2016 they are close to another load. RAPP also assists coordinating a market for two farm supply businesses in Ontario and Seneca counties using privately owned baler. They reported baling and shipping approximately 63,000 pounds of mostly bale wrap to NBF Plastics in Auburn. Their collection has been significantly reduced due to low prices for bale wrap

A large portion of RAPP's efforts is in assisting producers or other entities with their recycling efforts. 3,000 pounds of loose greenhouse film from NY Parks Greenbelt Native Plants Center to Brooklyn's plastic bags plant in October. 17,000 pounds of agricultural plastics from Vermont's pilot was collected and baled by Casella Resource Solutions. In August 2014, a large horticulture operation in Eden, NY, baled 84,000 lbs. of mulch film and shipped it to Delta Plastics. In November 2014, after five feet of snow fell in several days in the Buffalo, NY area, RAPP was contacted by this same operation to see if we could help with recycling the greenhouse plastic lost due to the storm. Eight thousand pounds of greenhouse film was baled.

### **Program Development**

RAPP has long had an interest in better serving the horticultural industry. A USDA (USDA NIFA SCRI) regional, multi-year grant was funded to increase the season for berry crops in the Northeast by growing under plastic tunnels. A recycling component was added to address the increased use of plastics. This effort is coordinated by Lois Levitan with NY RAPP assisting. Methods of removing, compacting and transporting plastic from low tunnels and single-bay and multi-bay high tunnels are being evaluated. This will help RAPP increase recycling within the larger greenhouse industry. This effort helped identify Ultra-Poly, a large plastics recycler in Pennsylvania, as a possible market instead of solely relying on overseas markets. Ultra-Poly tested greenhouse film in their production line and concluded they want to receive very large volumes. As reported later under Suffolk County efforts, this resulted in diverting 50,000 lbs. of greenhouse film from the landfill and will hopefully lead to larger collection of this very desirable material.

### **COUNTY EFFORTS**

#### **Cayuga County**

- **Participants:** Cayuga County has a total of 15 interested farms, 11 of which are dairy farms. The others include 2 beef producers, a horticulture operation and a marina. Four new farms began recycling in 2014/15. Unfortunately lack of a cooperator for the baler has resulted in RAPP only being able to collect on about 6 farms in 2015.
- **Outreach and Educational Events:** Cayuga County CCE personnel attended and "manned" the RAPP booth at Empire Farm Days in both 2014 and 2015, speaking with a number of interested farms and businesses. As an immediate result, Cargill Animal Nutrition in Liverpool was able to connect with NBF Plastics in Auburn to move 11,000 lbs. of Super Sack® bulk bags largely for reuse. Cargill had previously had to landfill these bags.

- SWCD has an interest in participating and baling on Cayuga County farms but has limited funding and personnel. The county is in a holding pattern as NBF Plastics has not commercialized its plastics-to-lumber process. NBF Plastics is limiting the quantity of material they want to receive.
- Plastic Activities: Baling occurred at 3 farms in the autumn of 2016, generating 5,000 lbs. of plastic that were taken to NBF Plastics.

### **Chautauqua County**

- Participants: Chautauqua County, new to RAPP, has recruited approximately 25-30 farmers who express intent to save plastic for recycling, approximately 18 are saving plastic and/or have baled. These are primarily dairy and livestock farmers and one agricultural business. A couple of farms are in Cattaraugus County.
- Outreach and Educational Events: From September 2015 through March 31, 2016, Cornell Cooperative Extension spoke to four groups including USDA – Seneca Trail Resource Conservation and Development Council (RC&D) regarding RAPP. RC&D expressed support for the program. 8 farms expressed intent to start collecting plastics and 6 have done so.
- Plastic Activities: Since starting the program the winter of 2015/16 represents the period with the largest amount of plastic used and saved for recycling. Chautauqua County SWCD has the cooperator agreement and coordinates baling with the farms. As of March 31, 2016, the baler was still in winter storage. Twenty-one bales of plastic have been generated for recycling, 13 are being stored at the NYP Management Company facility (the agricultural service business from above), 5 are at the Agriculture Service Center in Jamestown and 3 remain on the farms where they were baled.

### **Chenango County**

- Participants: Chenango County CCE has generated interest with 30+ farms in both Broome and Chenango Counties. The farms/businesses that have saved plastic for recycling include 12 dairies, 2 livestock, and a horticulture operation. The Chenango County DPW and their North Norwich Recycling Center have been active participants in the program by baling and storing agricultural plastics for recycling.
- Outreach and Educational Events: Donald Franklin from the Farmland Protection Board in Chenango County invited CCE to provide an update on RAPP in both 2014 and 2015. A baling demonstration was performed using plastic from 3 farms at Chenango County Dairy Day in June (2014). CCE discussed issues and the program with legislative representatives on an Ag Tour held in Chenango County in July 2014. A RAPP booth/poster and pamphlets was set-up at both the Afton Fair in July and at the Chenango County Fair in August. CCE personnel spoke with dairy farmers at both events.
- Plastic Activities: Chenango County DPW had been limiting outreach for baling in 2014 due to a lack of storage. After having rented a storage container, they were able to build a storage facility for agricultural plastics in 2015 through a grant from the Constitution Pipeline to CCE. Approximately 6 farms have been actively bringing bale wrap into the recycling center. 14,000 lbs. of ag plastics were shipped to the Brooklyn market in December 2015. With storage and the use of a different baler, the recycling center anticipates they will be able to accept larger volumes of plastic.

### **Delaware County:**

- Participants: Delaware County CCE has 85 active participants recycling agricultural plastics.

- Outreach and Educational Events: Delaware County CCE had an intern working actively with RAPP during the winter of 2016. She put significant effort into recruiting “hold out” farms and training regarding collection BMPs. She also presented at many Extension events and at the Annual Catskill Regional Agricultural Conference. Local press reported regarding RAPP. In April 2015, CCE hosted a RAPP Program Work Team (PWT) meeting including a tour of the new Delaware County Solid Waste Recycling Center. The meeting discussed how agricultural plastic recycling has been integrated with county recycling and generate enthusiasm and ideas for getting more areas of NY participating. Delaware County’s support has been instrumental in interesting other counties in starting agricultural plastics recycling.
- Plastic Activities: Plastics are collected at the Delaware County Solid Waste Facility. They are brought in by participating farmers using bulk bags. During the winter of 2015/16 the county surpassed a 50% collection rate for used ag plastics in the county. This is creating some challenges as some farms have to drive a long distance to the recycling center. There is consideration regarding opening one or more local transfer stations for ag plastics. During the autumn of 2015 and winter 2016, Delaware Solid Waste shipped 70,630 lbs. of agricultural plastics to market, donating the proceeds to RAPP.

### **Franklin County**

- Participants: Approximately 66 farms in Franklin, Essex and Clinton Counties are participating with RAPP. A number of the participants are maple producers. Franklin County Extension educators have been working very closely with TAP Industries, a materials recovery/reclamation/recycling facility that receives, separates and prepares recyclable materials for marketing to end-user manufacturers. TAP Industries is currently working on a processing line involving agricultural films; i.e. hay and silage bale wrap, feed bags, bunker cover, as well as maple tubing, nursery and greenhouse film, horticultural pots and trays, agricultural jugs, drums, and pails, and wood pellet bags. TAP Industries’ management would like to receive these plastics from any location, where it is logistically possible. The cost of transportation appears to be their foremost limiting factor, but this will diminish as their facility becomes fully operational and all agricultural plastic that is collected is made into new plastic.
- Outreach and Educational Events: While previously very active with outreach events, articles and producer meetings, Franklin County CCE has focused most recently on logistics of moving plastics from farms to market. One lesson learned in the Northern New York has been to have logistics in place, don’t just continuously bale materials.
- Plastic Activities: One hundred-twenty one bales were picked up from Franklin, Clinton and Essex counties and moved to TAP Industries’ facilities in Malone or Plattsburgh during the summer of 2015. The Clinton County SWCD baler continues to bale on-farm in Clinton and Essex Counties. As of March 31, 2016, Franklin County CCE is assisting with coordinating picking up 40,000 + lbs. in Clinton County.

### **Jefferson County**

- SWCD had used a program supplied BigFoot baler until September 2014. Jefferson County SWCD notified DEC that they were ending their participation in the program. This came about due to a reduction in staff and funding. Lewis County SWCD has since assumed the baler cooperator agreement.

- A number of participating farms and all of the marinas desire to have a continuation of RAPP in Jefferson County. Jefferson County Solid Waste (part of County Highway) is unable to manage the full program but can assist with receiving and shipping baled materials. Lewis County SWCD would be willing to make the baler available, and has, but is unable to manage operations outside their county. The Development Authority of the North Country (DANC) is interested in maintaining agricultural (and marina) recycling in the area and is developing a proposal to continue agricultural plastics recycling in Jefferson, St Lawrence and Lewis Counties (RAPP is active in Lewis County).

### **Lewis County**

- SWCD assumed the cooperator agreement for the former Jefferson County BigFoot baler during the winter of 2015. Twenty-four bales of plastic were generated on 11 participating farms and in August of 2015, 15,534 lbs. of plastic were shipped to the Brooklyn market, combined with 19,000 lbs. from Jefferson County. An additional 5,000 lbs. of plastic was baled during the autumn of 2015. As of March 31, 2016, SWCD had been unable to start baling plastic saved by farms during the recent winter months.
- The Lowville transfer station has expressed willingness to resume collections of plastic. This was done in the past and they have continued to receive baled ag plastics to load for shipping to market. This will be taken into consideration with any plans developed by DANC.

### **Madison County**

- Participants: Due to a staff retirement, Madison County CCE discontinued active outreach and education (previously reported). These efforts have largely been assumed by Madison County Solid Waste and Recycling. With ag plastics collection now available at most township transfer stations, farm participation is increasing but numbers are not specifically tracked.
- As reported earlier, Madison County baled and shipped approximately 160,000 lbs. of plastic for processing into fuel during this time period. RAPP helped arrange both of the processors for Madison County Solid Waste.
- Solid Waste shipped 44,040 of agricultural plastics to market for recycling in February 2016. This material went to the Brooklyn trash bag manufacturer.
- Madison County continues to try to attract a plastics-to-fuel plant to the Madison County Agriculture and Renewable Energy Business Park to process hard to recycle plastics from Madison County, diverting them from the landfill. They would also accept plastic regionally. They received 5 proposals to their RFP for plastics-to-fuel processing.

### **Ontario County**

The Ontario County Planning Department included agricultural plastics recycling in their updated Solid Waste Management Plan. The county has placed a priority on diverting potentially recyclable materials from their regional landfill. Cornell Cooperative Extension staff have taken the lead in interacting with the agricultural community as well as facilitating discussions between the County and Casella Waste Systems, which manages the landfill and the recycling center, regarding the agricultural plastics.

At a meeting on January 7, 2015, Ontario County Planning requested CCE Ontario County to survey farms in Ontario County to better estimate the types and amounts of plastic used. RAPP partnered with CCE in doing this and funded CCE to hire a summer college intern to manage the survey. The survey went out in April and was summarized in June. Three hundred-seventeen in-depth surveys were



mailed to area farms and 131 were returned, showing very high interest. Farmers expressed willingness to recycle about 60 tons (annually) of used plastics. Given that Casella collects regionally and 60% of the farms in Ontario County did not report, real potential is considerably higher. Casella is exploring the logistics of collection. There was a farm tour including RAPP, Casella, CCE and County Planning in July of 2015 where three farms, representing different types of plastic, were visited. This allowed Casella and County Planning (representing county transfer stations) staff to better understand where the plastic is and how it can be collected.

November 12, Casella hosted a meeting with Ultra-Poly, the recycler from PA, County Planning, CCE and RAPP. We visited Casella's Zero-Sort facility as well as a farm and a marina. Ultra-Poly expressed strong interest in recycling greenhouse film and possibly boat wrap. As a result, Casella is planning on doing test baling with boat wrap and greenhouse film. Ultra-Poly continues to look at the livestock films.

### **Otsego County**

- Participants: Otsego County Conservation Association (OCCA) and Otsego County SWCD recruited 3 new farms in the recent time period. This brings participant numbers over 45 through OCCA and SWCD although the majority of the plastic is collected from about 15 farms. Most of the participants are dairy farmers in Otsego County, but there are three farms in Herkimer County that have been recruited by these 2 entities.
- Outreach and Educational Events: OCCA personnel did 9 farm visits in which they discussed BMPs with participants over the recent time period. Recruiting is now done more by advertising and phone calls. Promoted RAPP on WSRK and WDOS radio stations. In 2015, a display was set up with RAPP information at several festivals and the County fair (Otsego Lakes Festival twice, the Goodyear Lake Festival and the County Fair twice). Over 2000 people in the general public had some exposure to the topic of agricultural plastic recycling and several new farms were recruited. OCCA and SWCD also reported three times about RAPP activities to the Otsego County Solid Waste and Environmental Concerns Committee.
- Plastic Activities: Otsego County SWCD has a BigFoot 300 baler and coordinates baling. Most baling to date has been on-farm. The local RAPP team expanded to include Casella Resource Solutions and County Planning. This has resulted in two spring collections (March and April, 2015) at the Southern Transfer Station in Oneonta and two fall collections (November 2015), one at Oneonta and one at Cooperstown. Over 15,000 lbs. of plastic were brought in by area farmers. Wood pellet bags were added to these collections, popular with homeowners using wood pellets. Additional collections are scheduled for the spring of 2016.
- Over the most recent reporting period over 70,000 lbs. of plastic was baled. In most cases, the plastic collected was good quality. Several farms struggle to save it as clean as the market wants, but it was all marketable.
- 65,685 pounds of plastic were shipped to the plant in Brooklyn in January and February 2016. Approximately 50,000 lbs. is baled and ready to ship to market.

### **St. Lawrence County**

St Lawrence County is no longer participating with RAPP but farm interest remains high. Both DANC and St Lawrence County Solid Waste are interested in developing a plan that may involve collecting agricultural plastics periodically at several transfer stations.

### **Tompkins County**

SWCD had held the cooperator agreement for the baler but did not renew it in 2015. At the end of August 2015, a SWCD staff member left which resulted in a reassessment of staff and program priorities. At the September (2015) Board meeting, SWCD voted to not continue the cooperator agreement. Cayuga, Cortland and Tioga SWCD managers have expressed interest in continuing the program but have limited ability with current staffing and questionable funding. RAPP had been using the baler contracted to Tompkins County in the central NY region for on-farm baling and demonstrations. Not having a local cooperator, RAPP has had to limit its baling activities in CNY.

The arrangement with Tompkins County SWCD allowed RAPP to collect and recycle 27,000 lbs. of ag plastics regionally in the fall of 2015, all material going to NBF Plastics in Auburn.

### **Washington County**

SWCD has opted out of the program in 2014. The largest factor was the county privatizing their solid waste management, making the transfer stations unavailable for farms to bring their baled plastic in for consolidation and shipment to market. The Washington County baler moved to Chautauqua County in 2015. Washington County's final shipment to market consisted of 55 bales, of which only about 1/3 were reasonably marketable. Some of the load was material that isn't actively collected and marketed by RAPP and another 1/3 was so dirty it was unmarketable. This emphasizes the need for strong outreach and education so farms know what RAPP wants and needs. In Washington County farmers did their own baling. When the program does not supply a trained operator the risk of unacceptable materials being baled greatly increases.

### **Wyoming County**

- **Participants:** Wyoming County CCE has the baler cooperator agreement and does the recruiting. They are active in Genesee, Livingston and Wyoming counties, with their total participation being over 60 farms with ongoing participation is closer to 40.
- **Outreach and Educational Events:** Since September of 2015, CCE has minimized its recruiting efforts as they can't handle more baling. CCE has displayed RAPP material at several events. At Agri-Palooza 2014 and 2015, a fun-filled day on the farm designed for the general public to experience and enjoy learning about modern day farming, attendees got to watch a baling demonstration and take home printed material about agricultural plastics recycling. The 2015 event was held at Broughton Farm, a RAPP participant. A display table with information was set up at Artisan Villa in September, the Harvest Fest in the Warsaw Village Park in October 2014. In November 2014, Wyoming County CCE personnel manned the RAPP booth at the NYSAR<sup>3</sup> conference and trade show in Cooperstown and RAPP was represented at the Wyoming County winter Maple School 2014 and 2015.
- **Plastic Activities:** In October of 2015, ~42,776 lbs. of ag plastics shipped from the Wyoming County program for recycling. Approximately 40,000 lbs. of plastic was baled. This leaves 90,000 lbs. of material from approximately 30 farms and two dry bean businesses ready for market. Logistics of moving bales from farms to a central location remains challenging. Most of the bales are silage cover, but there is also bale wrap and bulk bags.

### **Baling and Activities in other portions of NYS**

- **Chemung SWCD:** SWCD owns their own baler and has 8 very active farms recycling plastic however the majority of plastic comes from one farm. Since their last shipment in July 2015, these farms of collected and baled ~35,000 lbs. of plastic and are approaching being ready to ship another load to market. Chemung is a fairly small agricultural county however it is clear that there is plenty of plastic being used.
- **Clinton County SWCD:** SWCD owns and supplies two mobile balers to farms primarily in Clinton and Essex Counties. Until recently large numbers of bales of plastic have been generated and not marketed due to the lack of logistics to move them to a central shipping point. TAP Industries in Malone is in the process of commercializing a plastics recycling facility. TAP Industries has been taking in baled agricultural plastics. Approximately 80 bales were moved from Clinton County to TAP Industries in 2015. Approximately 80,000 pounds of additional material have been baled in Clinton (~45,000 lbs.) and Essex (~35,000 lbs.) Counties and await shipment to market.
- **Suffolk County SWCD** has a BigFoot 400 baler that mechanically pulls plastic off of greenhouses and bales it. Due to staff changes SWCD suspended their ag plastics program in 2015/16 and stored the baler at North Fork Nursery. Efforts largely through the USDA Berry Tunnel project resulted in Ultra-Poly, a Pennsylvania recycler, wanting to recycle greenhouse film in large volumes. North Fork Nursery was able to collect ~50,000 lbs. of used film from 300 greenhouses. It had not shipped to market as of March 31. A price of 9 cents per pound picked up at the farm was quoted.

### **BigFoot 300 Mobile Balers**

Managing existing baling equipment: The BigFoot 300 balers remain a maintenance challenge as they age. They are an excellent prototype but many, mostly minor, design flaws contribute to the high maintenance along with wear from use over time. The production rights for these balers were turned over to Kennco Manufacturing. As mentioned previously, RAPP has shared extensive notes and recommendations about these balers.

The BigFoot balers remain a valuable tool for recycling agricultural plastics, particularly with larger users of plastic. If a number of modest design changes are implemented by the manufacturer they would be highly recommended. Whenever possible the primary mode of ag plastics collection and baling should be through established Solid Waste Management infrastructure, not on-farm baling.

During this time period, RAPP has explored other mobile baling equipment, not for our use but for the benefit of other programs, businesses or farms expressing interest in mobile balers. Several balers have been identified in the UK and Ireland. One of these companies has US operations and inventory. As a general conclusion, other mobile balers have limitations regarding the range of materials we are collecting for recycling in NY. Traditional stationary balers are generally more versatile and robust in handling a large range of materials.

### **Status of OFAB Balers**

Cornell Legal Counsel reached agreement with OFAB Inc. regarding the fate of the two balers that failed to perform. Fifty percent of their cost was reimbursed (\$39,440.50 +/-) to RAPP. One baler was returned to OFAB at their cost and one baler has been scrapped by Cornell. The funding reimbursed to Cornell was used for RAPP activities as was directed by NYS DEC.