

## **2014 Final Report for: Rutgers NJ Ag Expt. Station – Cooperative Extension**

### **Project Title: Sustaining Urban Fringe Farming on Coastal Plain Soils**

#### **1. Report Summary**

##### **Two factors drive activities:**

- 1.)
  - a. NJ PDP outreaches directly to farmers and agencies with sustainable solutions, rather than by train-the-trainer through extension. NJ agriculture service provider capacity has dramatically declined, particularly extension specialists. Due to Rutgers urban focus, county extension staffing has been redirected to non-farm programs.  
b. Rutgers “Sustainable Farming on the Urban Fringe,” has become our dedicated web platform for reaching the farm community widely, and reaching around ag service providers. It was needed, designed, launched, and maintained with PDP support.  
c. The reporting period ended with an average of 2,060 page views per month, 137,000 during the period. During the three-year period we recruited 427 subscribers. 294 external subscribers: 121 farmers; 31 agribusiness input suppliers; 44 ag agency professionals (NRCS, FSA); 98 ag allied NGO ag community support groups (NJ Farm Bureau, NOFA-NJ, NJ Dept of Ag, media, local and urban ag support personnel). There are 110 subscribers from Rutgers cooperative extension ag program staff who receive their information by this method, plus 23 regional colleagues (e.g., SARE).
  - 2.)
    - a. Coastal plain soil farms require a soil improvement toolbox outside of cover crops, manures, and longer rotations. Municipal collected un-composted leaf applications are part of the solution. Coarse, low organic matter soils comprise 60% of NJ. While they are prized (early warming, easy tillage, field operations soon after rain, shallow irrigation access, long season) diminishing yields have been observed due to endemic soilborne diseases, compaction, and impermanence syndrome among aging farmers. These soils, and the farms on them, form the backbone of NJ’s \$1 billion commercial farming. If they lose productivity, the farmers on them lose viability and sustainability. It is impossible for farmers to maintain soil, let alone improve, using cover crops on coarse soils that oxidize organic matter. High land prices results in cash cropping every acre every year, reducing opportunities for fallow cover crop rotations. NJ has 12% animal agriculture, the lowest percent of any US State, resulting in a deficit of manures and forage crops for soil building rotations.  
b. Three field demonstrations using surface leaf mulching on organic white potato, sweet potato, and lima bean were completed and results outreached at events and blogged. For incorporating leaves, field events and workshop trainings were held. A signature accomplishment was NRCS NJ inclusion of municipal leaves under their Mulching Standard Code 484 for EQIP cost-share eligibility as a result of SARE PDP.  
c. We documented a total of 97 farms cumulatively filed applications to apply leaves (through 2013 when NJDEP stopped collecting data). In three counties where extension agents cooperated with PDP on events and outreach, the numbers of farmers were 17, 9,

and 22. This compares with all other counties with 1-10 farms (see Table 7). Sustained outreach efforts led to greater use of using a free community waste stream product to amend deficient soils.

#### **Optional Outcomes:**

Our Sustainable Farming on the Urban Fringe web is a durable platform (beyond the end of the PDP grant) dedicated to sustaining urban fringe farming. It has led many new farming extension clients for Rutgers—from NJ and beyond. “Farm Calls” enables us to answer a sustainable farming question in depth one time online. “Evidenced-based Agriculture” posts give us a platform to educate from literature review, rather than peer-to-peer on topics like the best time of day to flame weeds (8 hours or more after sunrise).

These are available and replicated without other local ag service providers wasting time fielding and investigating the same requests via phone or on-farm consults. They are effort multipliers.

## **2. Performance Target(s)**

**Ag Service Providers:** 5 ag professionals will become more competent and confident to recommend, teach, and advise on alternative cover crops and leaf application. We met this with three extension agents from Rutgers, and at least two members of NRCS. See the list in Table 7 below.

Farmers: Overcome barriers and grower resistance to see a 50% increase in the utilization of municipal collected waste leaves in NJ.

Though have not been able to quantify yards or tons utilized (NJDEP stopped collecting data in 2013), there has been a gain of more than 20 farmers sourcing and applying free municipal leaves to cropland. And existing farms have increasing their utilization rates on more acres. I feel our goal is satisfied. See Table 7 below.

## **3. Report on 2013-2014 Milestone Accomplishments**

**Revised milestone:** Evidence-based farming practices web outreach. Prepare summaries from NJ SARE related activities. Produce and disseminate one to two summaries per month to at least 50 ag service providers. Increase the readership to over 100 by end of September 2014. Conduct assessment fall 2014.

**Activites:** 16 articles were produced during the 2013-2014 period. 4 were multiple page guidance documents of results from NJ SARE field demonstrations, but not publicly available. 8 were “Farm Calls,” reaching wide audiences of ag professionals and farmers with answers to questions from one-on-one consults.

[Farm Calls: A Winter’s Tale of Two Fields](#)

[Farm Calls: Tillage Tools for “Breaking Ground”](#)

[Farm Calls: Biocontrol of Mexican Bean Beetle](#)

[Ask the Expert: Mel Henninger on Organic Potatoes](#)

[Farm Calls: Sweet Corn Varieties & Postharvest Capability](#)

[Farm Calls: Beginning Farmer Questions on Farm Leasing](#)

[Farm Calls: Exploring Exotic Mushroom Cultivation](#)

[Farm Calls: Vegetable "Seed Saving" for Small Farms](#) promote SARE published book

[Growing Better Organic Potatoes in NJ](#) with Leaf Mulch

[Roller Crimper Tips for NJ Growers](#)

[Selecting Summer Cover Crops](#)

[Seven Years of Cover Crops in Rotations](#) Chronicle NJ SARE demonstration soil OM changes

[Sex and the Single Asparagus](#)

[Understanding On-Farm Utility Costs and Billing](#)

[Lowering On-Farm Utility Costs with Electricity Monitors](#)

[Assessing Farm Equipment Efficiency](#)

[Effective Political Communications](#)

[Motivating Farmers to Attend Worthwhile Extension Programs](#)

## **3-Year Summary of Activities, Participants, Learning Outcomes and Products**

**Table 1 –Activities.**

| Type of Educational Activity Conducted by Project    | Number of Each Activity Conducted |
|--|-----------------------------------|
| Workshop/Field Day                                   | <b>9</b>                          |
| On-farm Demonstration                                | <b>8</b>                          |
| Tour   |                                   |
| Webinar/Talk/Presentation                            | <b>13</b>                         |
| Other on-line training                               |                                   |
| Individual Consultations (an estimate is acceptable) | <b>58</b>                         |
| Other (specify)                                      |                                   |

**Table 2 – Participants.**

| Type of Agricultural Service Provider   | Number Who Participated |
|---|-------------------------|
| Extension (RVV, MM, BS, WK, AW, DLL, PN, SK, JH, SM)                                | 10                      |
| NRCS and FSA (CH, FK, JM, EM, MS, RS, EM, CS, GB, CC, NC, FG, DK, DM, MP, MP2, MP3) | 17                      |
| Other Federal/State Agency NJDEP-RH   | 1                       |

|   |    |
|---|----|
| Other (specify) NOFA-JC, EM                         | 2  |
| Total Number of Agricultural Service Providers*     | 30 |
| Farmers RMJr, KF, W&MM, BM, TJSpring, BGBlue, MB, K | 8  |

**Table 3 - Learning Outcomes.**

|  | Total Number of Agricultural Service Providers | Total Number of Farmers | Total number of acres or animals the farmers manage, if known |
|--|--|-------------------------|---|
| Verified an increase in knowledge, skills, confidence  | 25   | 74                      | 30,000  |
| Verified intention to use knowledge and/or skills learned  | 28   | 10                      | 4,000   |
| *Bulleted list of only the key knowledge and skill areas for which you verified an increase in knowledge and skills.   |  |                         |   |
| <ul style="list-style-type: none"> <li>• Likely to recommend un-composted municipal leaves as soil amendment</li> <li>• Likely to consider using un-composted municipal leaves as soil amendment</li> <li>• Believe improving soil OM reduces incidences of soilborne diseases and fungicide expenses</li> <li>• Specific cover crops can impact specific soilborne pest problems</li> </ul> |  |                         |   |

**Table 4 – Products.**

| Type of Information Product Produced      | Number of Each Type Produced  |
|---|-------------------------------|
| Fact sheet/Guidance document              | <i>Captured as page views</i> |
| Shredded Leaf Mulch Organic Potato (6p)   | <b>1</b>                      |
| Roller Crimper No-Till Process Tomato 8p) | <b>1 + ~35 hand out</b>       |
| Roller Crimper Troubleshoot Guide (5p)    | <b>1 + ~35 hand out</b>       |
| Summer CC selection Coastal Soils (5p)    | <b>1 + ~60 hand out</b>       |
| Decision tool                             |                               |
| Website/web content                       | <b>Page Views</b>             |
| Sustaining Urban Fringe Ag                | <b>131,445</b>                |
| Aerated Static Pile Composting            | <b>6,026</b>                  |
| Article (newsletter, press)               | <i>Captured as page views</i> |

|   |  |
|---|--|
| Sustain Ag Urban Fringe 'Briefing'<br>'Farm Calls'  | <b>11 + ~240 handed out of each brief</b><br><b>19</b> |
| Curricula   |  |
| Video<br>'Breaking Ground' Tiller<br>Backpack Sprayer + Trainer Guide                                 | <b>Views</b><br><b>2 493</b><br><b>6 &gt;6,000</b>     |
| Other (specify) NJ SARE program summary publication for ag leaders, "Getting it Right for NJ Ag" 16p) | <b>325</b>   |

#### 4. Performance Target Outcomes and Additional, Unanticipated Outcomes

##### a. Summarized Outcome Data

**Table 5 – Numbers of agricultural service providers taking action**

|   |             |
|---|-------------|
| The total number of agricultural service providers who incorporated information and/or used skills learned through the state program training activities in their educational activities, services and/or information products for farmers. | <b>~ 9</b>  |
| The total number of farmers these agricultural service providers reached through their efforts.   | <b>~ 40</b> |

**Table 6 – Actions taken by the agricultural service providers**

| Place an X next to all that apply | Types of Educational Activities Ag Service Providers incorporated information they learned into | Number of Each Activity Type, if known |
|-----------------------------------|---|--|
| X                                 | Workshop/Field Day  | <b>3</b>                               |
| X                                 | On-farm Demonstration   | <b>3</b>                               |
| X                                 | Webinar/Talk/Presentation   | <b>5</b>                               |
|                                   | Other on-line training  |  |
| X                                 | Individual Consultation (an estimate is acceptable)   | <b>~ 70</b>                            |
| X                                 | Fact sheet/Guidance document  | <b>1</b>                               |
| X                                 | Article (newsletter, press)   | <b>~ 7</b>                             |
| X                                 | Web content   | <b>14</b>                              |

|  |                 |  |
|--|-----------------|--|
|  | Other (specify) |  |
|--|-----------------|--|

**Table 7 – Actions taken by farmers**

|   |   |
|---|---|
| The <b>number of farmers</b> who made a management change as a result of learning from the project activities and/or the trained agricultural service providers?  | 18, likely >  |
| Bulleted list of the changes made by farmers  |   |
| <ul style="list-style-type: none"> <li>Farmers applying municipal-collected un-composted leaves to soil. From 2011 to 2012 there was a gain of 4 farms. From 2012 to 2013 another gain of 4 farms. NJDEP discontinued collecting farmer data in 2013. While I cannot claim sole credit to PDP, in the table below we found much greater numbers of farmers in three counties where extension agents invited multiple PDP learning events on soil improvement and leaves, and who worked with PDP on farm consults and program promotion.</li> </ul> |   |
| <u>NJ County</u>  | <u>No. Farms filing leaf applications as of 2013</u>              |
| Atlantic  | 5   |
| Burlington  | 4   |
| Camden  | 7   |
| Cape May  | 1   |
| Cumberland  | 2   |
| Gloucester  | 17 (Agent Michelle Infante-Casella, invited programming with PDP) |
| Hunterdon   | 1   |
| Mercer  | 9 (Agent Meredith Melendez invited multiple programming with PDP) |
| Middlesex   | 3   |
| Monmouth  | 22 (Agent Bill Sciarappa invited multiple programming with PDP)   |
| Morris  | 1   |
| Ocean   | 2   |
| Passaic   | 1   |
| Salem   | 7   |
| Somerset  | 5   |
| Warren  | 10 (Active NRCS District Conservationist program)                 |
| <b>Total Farm Applications 97</b>   |   |
| List of farmer municipal leaf applicants recorded by NJDEP, Solid Waste Management Program, Bureau of Recycling & Planning. NJDEP discontinued keeping these records at the end of 2013. Non-farmers were removed from counting (municipalities, commercial contractors and commercial composters).   |   |
| <ul style="list-style-type: none"> <li>Farmers utilizing roller crimper for no-till pumpkin, winter squash, or sweet corn production increased from 4 to at least 15.</li> <li>About 6 equine operators in 3 states have constructed aerated static pile composting facilities after finding our SARE materials.</li> </ul>   |   |

|  |      |
|--|------|
| Number of acres, animals, or other appropriate production units that were affected by these changes.<br><i>(please enter your best estimate; you may leave this blank if you have no idea)</i> | 600+ |
|--|------|

**Table 8 – Additional outcomes as a result of the project**

| Type of Outcomes Achieved      | Number of Each Outcome |
|--------------------------------|------------------------|
| New working collaboration      | 3                      |
| Grants applied for             | 2                      |
| Grants or other funds received | 2                      |
| Other (describe)               |                        |

#### **b. Outcome Narrative**

An outcome of online sustainable urban fringe content posted after a field demonstration was the Urban Market-Garden Rapid Soil Assessment for Trace Metal Contaminants brief in 2011: <http://njaes.rutgers.edu/pubs/urbanfringe/pdfs/urbanfringe-v06n05.pdf>. Experiences were written and web posted after an NRCS – Extension NJ demonstration using a handheld x-ray fluoroscope (XRF) to perform rapid site assessment of lead and arsenic levels in soils at far lower cost compared to soil test labs. Since 2011, some 50 potential NJ urban ag sites and a few larger farms have been sampled for safe soils. In 2014, our extension urban ag trainer in Newark received a \$30,000 grant to purchase a XRF for dedicated for use in his urban ag programming.

Another example is roller crimper adoption. There were two underutilized roller crimpers acquired by NRCS NJ for demonstration loan. NJ PDP 1<sup>st</sup> incorporated them into our coastal plain soil quality work in 2009. It took until the current project cycle in growing season 2012 to master the learning curve pitfalls and weaknesses (many) of crimpers. A successful roller crimper process tomato mechanical harvest demonstration with a SARE grower grant was conducted in 2012, and results added to our [SARE web site](#) in 2013.

As a result, in February 2013, we were invited by publically traded B&G Foods to share project results with a group of 16 contract process tomato growers and 6 professionals (plant manager, tomato breeder, IPM consultant, field men, extension specialists: <http://sustainable-farming.rutgers.edu/wp-content/uploads/2014/02/Roller-Crimper-Processing-Tomato-Production-and-Grower-Discussion-Rabin-2013.pdf>). The 16 growers represented 1,265 acres of production, harvesting 32,000 tons per year, producing 900,000 cases of packed tomato products. None of the growers previously heard of a roller crimper. The farm size of the growers varied from 120 acres to 4,200 acres. Today, there five I&J crimpers in NJ, mostly on no-till pumpkin production.

## **Performance Target Outcomes**

We now have up to 97 farms who may accept and spread municipal collected leaves for cropland soil application vs. about 75 when we began in 2011. Even existing farmers are now better informed on incorporating leaves to improve soils while avoiding microbial inhibition of soil N.

Most farmers are unwilling to adopt the long non-cash crop fallow periods practiced at Bob Muth Family Farm where demonstrations and training were conducted. Two farmers who learned about the prospect of improving their coastal plain soils with municipal leaves have worked with PDP, uses lower rates of 6-8 tons/a instead of 20 tons/a, and cash crop the same season. Using the lower rates and advised by PDP, Rich Marolda, Jr. at Marolda Farms has converted at least 35 acres to organic on a 375 mixed conventional/organic vegetable operation. Kevin Flaim of Flaim Farms, an approximately 200 acre operation spreads lower rates of aged leaves stockpiled by the local municipality for a year, so they begin to mineralize nutrients and do not require fallowing. See photos of Flaim Farm leaf application at:

[http://aesop.rutgers.edu/~rabin/Ag\\_Research\\_Extension/Sustainable\\_Ag/Leaf-Mulch-Flaim/index.html](http://aesop.rutgers.edu/~rabin/Ag_Research_Extension/Sustainable_Ag/Leaf-Mulch-Flaim/index.html)

## **Other Results, Unanticipated Outcomes and Interesting Finding**

1. Ag Deans, State Depts. of Ag and NGOs better recognize and support visible programs connected to farmers that also have a quality web presence. For example, as a result of PDP outreach, in 2014 Duke Farms (2,700-acre farm supported by the Doris Duke Foundation) invited PDP to advise them on their cover crops initiative and participate on their NRCS CIG. They are supporting a \$7,000 a year ag student stipend for three years to manage the cover crops relationship between Rutgers and the farm.
2. Addressing coastal plain soil improvement through SARE PDP coincided with the USDA NRCS national focus on soil health and cover crops. This helped renew programming relationships between the sister agencies of Cooperative Extension and NRCS that had declined over many years. As a result of the PDP, extension is integrated on the state NRCS soil health team, and NRCS members have became the best PDP training collaborators. Ag service provider relationships were rebuilt that will last well beyond the end of the project, probably career long trust has been established.

## **5. 2013-2014 SARE Outreach Activities**

| Event/Activity | Number of Contacts ( <i>please enter your best estimate</i> ) |                   |
|----------------|---|-------------------|
|                | Farmers   | Ag. Professionals |
|                |   |                   |

|   |    |   |
|---|----|---|
| Leaf application training at Muth Farm with NOFA-NJ | 9  | 4 |
| Leaf Application site visits with NRCS (2x)         | 3  | 7 |
| Roller crimper demonstration at Menegus Farm        | 2  | 2 |
| Improving soils with amendments and crimpers        | 62 | 6 |
|   |    |   |

## 6. Assessment of Project Approach /Lessons Learned/Future Recommendations

**Actions take longer to bear fruit.** A common learning observation has been that activities do need lead to adoption immediately. Some activities from a field demonstration take a 2-3 years or more before they diffuse into the farm community.

**Support long distance tours.** In over 20 years working with SARE at Rutgers, the single program that ag service providers recall as offering the most lasting impact on their programming was in year (2001). NE SARE provided extra funds for each state to propose a service provider farm tour for extra funding. A NJ group arranged a guided trip to sustainable ag projects in California. This included visiting the 100-year long-term rotations soil demonstration initiated at UC Davis (LTRAS), large farm compost operations for the horticulture industry, a visit to CCOF, California's organic certifying agency, and a wide variety of other 'out of the box' venues not available in our region. There has been no NESARE supported learning experience since that compares or remains in participants memories when I speak to them.

**Bottom line PDP Role:** There is no effective train the trainer paradigm that works in extension at Rutgers in NJ. Bringing SARE solutions, products, and outreach to NJ farmers will always fall directly on efforts of the PDP coordinator, not a multiplier train the trainer impact.

Ag service providers, private and public, are overwhelmed in their duties. Additionally, at Rutgers there is no formal (or even informal) in-service ag training and development. There is no attendance mandate for compelling new program or skills building. There are no statewide ag programs for service providers to adopt, conduct, or report against.

Any proposed PDP activity that do not fit into already existing program priority of an ag service provider's agenda is likely ignored, even if greeted with enthusiasm Providers are pleased to offer SARE PDP programs to farmers, as long as it is ALWAYS the PDP coordinator conducting the programming.

**Farmers say three things typically engage them:**

- Testimonial experiences from other successful local farmers

- A profitable return on investment within three years for any proposed sustainable practice change
- Kick the dirt demonstrations at farms local to them

In general, NJ farmers and ag service providers, are an experienced, knowledgeable, and jaded group. We operate under the influence of the NY metropolitan non-farm culture of competitive cynicism and complaint that affects farming culture. There is a wide perception that generalist public sector ag service providers have little that is compelling to offer well-established medium size and larger full-time farms (a medium farm being about \$250,000 to \$2 million in sales). The challenge for service providers is that farming has become strongly bifurcated. There are large numbers of smaller, part-time, supplemental income or lifestyle farms. Even though they do not produce much economic impact, they are clientele and voters whose aspirations deserve respect. When extension addresses the numerous small farms, they are seen as useless to larger farmers producing most agricultural output and demanding sophisticated technological advising. Extension is caught. If they do not serve smaller farms, they are seen as ignoring farm families and people and focusing on attention on elite large growers.