Texas AgriLife Research
Texas Water Resources Institute

Environmental Effects of In-House Windrow Composting of Poultry Litter
FY 09 CWA 319(h)
TSSWCB Project No. 09-05

Quarter no. 8 From 07-01-11 through 09-30-11.

I. Abstract
Preparations were made for litter windrow composting, application and sampling. This will take place between July 25 and August 1.

II. Overall Progress and Results by Task

TASK 1: Project Administration
Subtask 1.1: TWRI will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15th of January, April, July and October. QPRs shall be distributed to all project partners.

The following actions have been completed during this reporting period:

a. TWRI submitted Year 2, Quarter 7 progress report on July 15, 2011.

58% Complete

Subtask 1.2: TWRI will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.

The following actions have been completed during this reporting period:

a. As of June 30, 2011, $86,685.00 or 32% of federal project funds had been expended.

32% Complete

Subtask 1.3: TWRI will participate in meetings with TSSWCB and project partners as appropriate in order to efficiently and effectively achieve project goals, coordinate monitoring efforts and summarize activities and achievements made throughout the course of this project.

The following actions have been completed during this reporting period:

a. A project meeting was held July 7. POSC brought up concerns of lack of moisture in the litter preventing a proper composting process. POSC said that litter moisture is typically low, and with the drought and extreme heat, that he was concerned that a proper composting process could not take place. The project team decided to move the windrowing and application to October utilizing the same schedule. (Appendix A)
b. A project meeting was held August 2 to discuss the IWC demonstration field day. It was discussed to hold the field day at the Riesel site to provide a site for all poultry producers. This would provide a site free of concerns about proprietary information, conflict of interest or bio-safety that can be raised by visiting other poultry producer sites. Videos of litter windrow would provide a health concern free environment that will not be restricted by concerns of limited viewing space in a poultry house. It was suggested to spread litter on the field at Riesel to simulate in-house conditions and then windrow on site for demonstration purposes. TSSWCB Poultry Program Specialist Mark Cochran suggested that we do not attempt to do a demonstration on site at a producer’s site. TSSWCB NPS team members Aaron Wendt, Loren Warrick directed POSC to discuss with the Poultry Alliance and see what they suggest.

66% Complete

Subtask 1.4: **TWRI will work with the POSC, USDA-ARS, and SAML to ensure appropriate communication with the poultry industry.**

The following actions have been completed during this reporting period:

a. POSC continues to communicate with Sanderson Farms (who fully supports the project activities).

66% Complete

Subtask 1.5: **TWRI will organize semi-annual TTVN meetings with project participants to discuss project activities, project schedule, lines of responsibility, communication needs, and other requirements.**

The following actions have been completed during this reporting period:

a. Project meetings were held on July 7. See subtask 1.3 for more detail.

66% Complete

**TASK 2: Quality Assurance**

Subtask 2.1: **TWRI will develop a QAPP for activities in Task 3 and 4 consistent with the most recent versions of EPA Requirements for Quality Assurance Project Plans (QA/R-5) and the TSSWCB Environmental Data Quality Management Plan.**

All monitoring procedures and methods prescribed in the QAPP shall be consistent with the guidelines detailed in the TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415) and Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416).

The following actions have been completed during this reporting period:

a. QAPP has been approved.

100% Complete
Subtask 2.2: **TWRI will submit revisions and necessary amendments to the QAPP as needed.**

The following actions have been completed during this reporting period:

a. No activity to report this quarter.

66% Complete

**TASK 3: Demonstration of IWC of Poultry Litter**

Subtask 3.1: **POSC will work with integrators (primarily Sanderson Farms) in Limestone and Falls Counties to identify a cooperator (poultry grower) for conducting the IWC demonstration. The cooperator demonstration site will provide the poultry house where IWC will be performed and the IWC and raw litter for land application.**

The following actions have been completed during this reporting period:

a. USDA ARS is holding a Nutrient Management Field day at Riesel on October 21 and will discuss the project.

25% Complete

Subtask 3.2: **IWC will be conducted by POSC at the cooperator site identified in Subtask 3.1 in years 1 and 2 to demonstrate and evaluate IWC utility prior to litter removal from poultry houses.**

The following actions have been completed during this reporting period:

b. No activity to report this quarter.

10% Complete

Subtask 3.3: **Raw and IWC poultry litter samples will be collected by POSC prior to land application to evaluate the effect of composting on levels of bacteria, nutrients, and volatiles in the litter. Bacteria levels (E. coli) in the litter will be analyzed by SAML. Nutrient levels (N-P-K) in the litter will be analyzed by SWFTL. Volatiles emitted from the litter prior to land application will be analyzed by W-TAMU.**

The following actions have been completed during this reporting period:

a. No activity to report this quarter.

0% Complete

Subtask 3.4: **Raw and IWC poultry litter will be applied by POSC at 3 tons/ac to the USDA-ARS Riesel site. Annual soil tests will be performed by SWFTL and by USDA-ARS.**

The following actions have been completed during this reporting period:

a. No activity to report this quarter.

25% Complete

Subtask 3.5: **POSC will assess the cost of implementing IWC on poultry operations for inclusion with educational materials as compared to conventional methods.**
The following actions have been completed during this reporting period:

a. No activity to report this quarter.

0% Complete

**TASK 4: Analysis of Environmental Effects of IWC**

Subtask 4.1: *Runoff samples will be collected from two pastures at the USDA-ARS Riesel site for about one year prior to litter application and for about two years following litter application to evaluate the impacts of using IWC poultry litter versus raw poultry litter. Runoff samples will be collected from all other field- and watershed-scale sites at Riesel to quantify nutrient and bacteria from background sites and litter application sites. E. coli levels in water samples will be evaluated by SAML. Nutrient analysis (NO$_3$-N, NH$_4$-N, and PO$_4$-P) for water samples will be conducted by the USDA-ARS with funding from another project.*

The following actions have been completed during this reporting period:


50% Complete

Subtask 4.2: *Runoff samples will also be collected from four 0.25 acre field sites at the USDA-ARS Riesel site for about 1 year prior to litter application and for about 2 years following litter application to compare the impacts of using IWC and raw poultry litter on bacteria and nutrient runoff. Two of the field sites will receive raw litter and two will receive IWC litter. Rainfall amounts, runoff, and quantities of E. coli and nutrients will be evaluated. E. coli levels in water samples will be evaluated by SAML. Nutrient analysis (NO$_3$-N, NH$_4$-N, and PO$_4$-P) for water samples will be conducted by the USDA-ARS with funding from another project.*

The following actions have been completed during this reporting period:

a. No activity to report this quarter.

50% Complete

Subtask 4.3: *POSC and W-TAMU will also evaluate other potential environmental benefits of using IWC poultry litter instead of raw litter. Through the use of field assessment of volatile levels at the litter application sites at Riesel by POSC and W-TAMU, the environmental impacts of using IWC poultry litter instead of raw litter will be demonstrated/evaluated.*

The following actions have been completed during this reporting period:

a. No activity to report this quarter.

20% Complete

**TASK 5: Technology Transfer**

Subtask 5.1: *POSC, SAML, and USDA-ARS, with assistance from TWRI and project participants, will develop outreach materials (1 refereed journal article and 1 Extension fact sheet) summarizing the results of the demonstration and the analysis of the environmental impacts of IWC poultry litter. The Extension Fact Sheet will be submitted to the TSSWCB and poultry integrators for review prior to publication.*
The following actions have been completed during this reporting period:

a. No activity to report this quarter

25% Complete

Subtask 5.2: POSC will conduct 6-9 grower meetings throughout the poultry producing areas of the state to present results of the IWC demonstration/evaluation. POSC will work with poultry integrators to deliver 2-3 programs for growers for each integrator (Sanderson Farms, Tyson, Pilgrim’s Pride). At least 1 field day will be held in conjunction with the grower meetings to view the IWC at the cooperator site and Riesel field sites. TWRI will assist POSC by developing press releases, meeting notification materials for distribution prior to the meetings, and post meeting summaries.

The following actions have been completed during this reporting period:

c. USDA ARS is holding a Nutrient Management Field day at Riesel on October 21 and will discuss the project.

5% Complete

Subtask 5.3: TWRI, with assistance from POSC, USDA-ARS, and SAML, will develop (Month 1-6), host and maintain (Months 6-36) a project website for dissemination of project materials.

The following actions have been completed during this reporting period:

a. The Environmental Effects of In-House Windrow Composting of Poultry Litter website went online in February 2010. It can be found at http://windrowlitter.tamu.edu/. Since the website went online, it has been viewed by a grand total of 251 unique visitors.

b. This quarter, the website was viewed by:
   • 21 unique visitors in July 2011
   • 13 unique visitors in August 2011
   • 16 unique visitors in September 2011

66% Complete

Subtask 5.4: POSC, with assistance from TSSWCB, TWRI and USDA-ARS, will work with USDA-NRCS to make necessary revisions to various practice standards (i.e., 629 Waste Treatment, 633 Waste Utilization, 317 Composting Facility) to include IWC.

The following actions have been completed during this reporting period:

b. No activity to report this quarter

100% Complete

Subtask 5.5: POSC will work with SAML, USDA-ARS, and TWRI to develop a final report summarizing the results of the project.

The following actions have been completed during this reporting period:

a. No activity to report this quarter

0% Complete
III. Related Issues/Current Problems and Favorable or Unusual Developments
  • Actual IWC and litter application delayed until the beginning of October, to wait for more ideal conditions.
  • Discussion has begun on the possibility for the need of a no cost extension. We are waiting to see how the project progresses.

Projected Work for Next Quarter
  • Apply litter at Riesel
  • Analyze volatile samples
  • Analyze soil samples
  • Analyze panelist data
## IWC Schedule 10/3 - 10/10/2011

<table>
<thead>
<tr>
<th>SUNDAY</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
<th>SATURDAY</th>
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<tbody>
<tr>
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<td>3</td>
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<td>8</td>
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<tr>
<td>Litter delivery to Riesel.</td>
<td>Apply Litter in morning</td>
<td>Panelists sample odor 09-1200</td>
<td>Craig- litter acquisition &amp; delivery to Riesel, bottled water, ice chest, 3 nasal rangers, chambers</td>
<td>Eddie- 3 nasal rangers, tubes</td>
<td>Panelists sample odor 09-1200</td>
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<tr>
<td>Soil and litter samples taken (TBD depending on litter delivery time)</td>
<td>09-11ish- collect demographic information, train panelists (16 adults)</td>
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<tr>
<td>Afternoon- Scout sites for panel placement when Eddie arrives</td>
<td>Afternoon- volatile sampling w/ chambers and tubes, take soil</td>
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<tr>
<td>Panelists sample odor 09-1200</td>
<td>Craig- litter acquisition &amp; delivery to Riesel, bottled water, ice chest, 3 nasal rangers, chambers</td>
<td>Eddie- 3 nasal rangers, tubes</td>
<td>If 8/2-3 soil samples reveal greater than background numbers, more samples will be taken</td>
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<tr>
<td>Daren- litter spreading, ice</td>
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