TSNA Sub-Group Report
October 16, 2013

CORESTA Sub-Group
TSNA in Air-Cured and Fire-Cured Tobacco

Liaison: Davis Martin

Andy Bailey
Univ. of Kentucky / Univ. of Tennessee

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- 6 original objectives
  - Subcommittees assigned to address each objective
- 3 objectives completed or dropped
- 3 objectives near completion

Objectives Completed or Dropped

- Obj. 1: Survey of critical farmer practices – completed and submitted to Scientific Commission
- Obj. 2: Collaborative study to investigate standard deviation of moisture content of marketing packages – dropped
  - Initial moisture content of marketing package not as important as storage environment of marketing packages.
- Obj. 3: Develop standardized nornicotine screening protocol so that baseline levels of nornicotine are comparable in tobacco seed varieties used by investigators - completed
  - Agreed that Univ. of KY screening protocol could be used without adding “LC” to variety name, only include acknowledgement that this protocol was used. If “LC” is added to name, Univ. of KY protocol must be used.

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- Objective 4:

  Develop a collaborative study which uses HOBO data loggers or similar instruments to collect curing conditions and possible impact of TSNA levels for tobaccos of diverse origins and curing environments. Attempt to standardize placement of equipment.

Chair: Vacant

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- Objective 4 status: nearing completion
  - Cooperative study conducted in 2008 and 2009 by Virginia Tech and Univ. of TN:
    - directly compare the influence of growing and curing environments
    - compare environmental data from HOBO meters placed on tier rails between tobacco and within tobacco during air-curing of burley.

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Objective 4 Status

- Results of collaborative experiment:
  - indicated that growing environment also impacts TSNA formation
  - Suggested that at low temperatures, RH has lesser influence on TSNA

- When evaluating TSNA across many environments, too much variability to confirm that higher RH and higher temp always result in higher TSNA.

CORESTA Graduate Student Study Grant Project Relative to Objective 4
(Placement of Meters in Barns)

- M.S. Graduate Student – Mitchell Richmond, Univ. of KY
- Project began Fall 2012, repeated Fall 2013
- Analysis of correlation between curing conditions and corresponding TSNA levels at various locations within curing barns
- 2 barns in KY (Princeton and Lexington) housed with dark air-cured tobacco and 27 data loggers to monitor curing conditions
  - screened and high-converter tobacco of the same variety (TR Madole)
  - Green leaf samples and soil samples collected prior to harvest
  - Nitrite and TSNA in green leaf, nitrate in soil
- Cured leaf samples of screened and high converter tobacco will be collected near each meter at takedown for TSNA analysis.
- Correlation between curing conditions (temp and RH) and corresponding TSNA levels across each barn will be accessed.

CORESTA Graduate Student Study Grant Project Relative to Objective 4

(Placement of Meters in Barns)

- First year of experiment and data collection completed
- Second year of experiment curing now
- Project should be complete by Spring/Summer 2014
- Thanks to CORESTA Scientific Commission for providing study grant to support graduate student project.

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Objective 4 Status

- Draft written on recommendations for placement of data logging instruments in curing structures and given to subgroup members for review.
  - Colin Fisher and Mitchell Richmond (Univ. of KY) will add information on data logger calibration.
  - Dr. Lowell Bush (Univ. of KY) has additional information on meter placement that may also be added.

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- Objective 5:

  Resolve sample handling of post-cure tobacco for TSNA analysis.

Chair: Marlene Adams, R.J. Reynolds Tob. Co.

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- Objective 5 status: reevaluation
  - Protocol developed but under reevaluation
    - Protocol should address methods for sampling plants and for sampling bales.
    - Concerns expressed over maximum temperature given on protocol for air-drying samples (35 C)
    - Group agreed to review sampling protocols from various companies to find consensus in sampling methodology.
    - 2 additional sampling protocols submitted to subgroup from ITB and JT

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- New revised protocol drafted based on review of additional protocols and input from subgroup
  - Addresses plant and bale sampling, will add section on large scale industrial sampling (reference to section 6.2.1 in CORESTA Guide 13)
  - Maximum temperature for air-drying samples reduced to 25 C
  - Will add information on air-drying procedures
- Will update and submit to subgroup for final comments
- Final protocol will be submitted to scientific commission

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- Objective 6:

  Review issues of post-cure tobacco storage and ventilation parameters.

Chair: Lowell Bush, Univ. of KY

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- Objective 6 status: near completion

  Experiments have been conducted and data collected. Report completed. Related manuscript near publication.

  – Proposed that group should evaluate post cure storage conditions in areas of Africa and develop a checklist of critical questions to help facilitate collection of information.

    - Set of questions developed and sent to representatives in Malawi and Zimbabwe for comment.

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- Development of general guidelines/best production practices for reducing TSNA in air-cured tobacco
  - TSNA chapter in KY/TN Tobacco Production Guide can be framework

- TSNA SG website

http://ces.ca.uky.edu/darktobacco/CORESTA TSNA SG