I. Occupational Health Profile
Tobacco Workers

Tobacco is the nation’s ninth highest valued crop and is grown in 16 states. Kentucky and North Carolina produce about 2/3 of all domestic tobacco, although tobacco is also grown further North in places like the Connecticut River Valley to make cigar wrappers. Migrant and seasonal workers help grow, harvest, and prepare the tobacco. There are considerable work-related injuries and illnesses involved in working with tobacco.

Injury events, diagnosis, contributing factors...pages 1-2
Tobacco harvesting conditions, varieties......pages 3-4
Irritant injuries.................................pages 5-6
Intoxication Injuries-Green Tobacco Sickness.pages 7-8
Musculoskeletal injuries.........................pages 9-10
Chemical illnesses, pesticides.................pages 11-13

Medical Conditions Commonly Seen in Tobacco Workers

Results from a 3 year NEC surveillance study taking place in ME, MA, CT, NY, NJ, PA and MD at federally-funded Migrant Health Centers. Injury and Illness events were documented in patient medical charts and close to 1700 injuries and illnesses were identified in all commodities.

Tobacco workers work from bottom to top on the tobacco plants, so they have varied postures throughout the season. Maintaining and harvesting the plants requires fast, repetitive motions and often awkward postures. They work in hot and wet environments daily.

Main Injury Events: Tobacco Workers

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Medical Conditions Commonly Seen in Tobacco Workers

Most Common Diagnoses: Tobacco Workers

- Back Injury
- Arthritis
- Other
- Pain (generalized)
- Infection
- Ocular Injury/Inflammation
- Repetitive Strain Injury
- Muscle Spasm
- Trauma
- Dermatitis
- Allergies
- Sprain/Strain

Most Common Contributing Factors: Tobacco Workers

- Crop covered w/natural irritant
- Using tractor/trailer
- Repetitive motion
- Other
- Chemical exposure
- Awkward posture
- Lifting
- Grasp/pick/pull
- Carrying object
- Environmental exposure
- Inadequate protective gear
- Weather Conditions
- Bending/Stooping
II. The Tobacco Workplace

Working conditions throughout the harvesting season

Tobacco maintenance and harvesting conditions:

► First 2 weeks of July: The flower must be cut off from the top of a growing plant, which is called “topping” (right).
  - Repetitive reaching: Topping may cause pain/strain.
  
► Beginning mid-July and ending mid-September: Picking the tobacco leaves from adult plants, or “priming.”
  - Wet conditions: Priming begins early in day to avoid heat, but plants are covered with dew and workers become wet in minutes.
  - Sticky secretions: By late morning, heat makes plants produce sticky secretions, which covers the workers’ clothing and skin.
    ▶ Combination of sweat and raw tobacco juice stings the eyes.
  - Awkward postures: Priming occurs 3-10 times in each field throughout the season, and requires workers to maintain various awkward positions.
    ▶ 1st priming: Must sit or severely bend to reach the leaves.
    ▶ 2nd and 3rd primings: Must kneel for long periods of time.
    ▶ Rest of primings: May stand up straight to reach leaves.
  - Repetitive movements: Leaves are “snapped” in either a quick, upward motion or a traditional quick, downward motion.
    ▶ Leaves are placed underneath the arm (leaves shown above-right). A gummy layer of juice collects here.

► General conditions for any work task in a tobacco field:
  - Unavoidable plant contact: Plants are close together, so they brush workers walking through them.
  - Intense heat and humidity: Either working in direct sunlight or under humid tents.
  - Other plant handling: The tobacco leaves are handled many more times throughout the process of their preparation, such as hanging them in drying barns and sewing tobacco leaves.


II. The Tobacco Workplace

Plant varieties and related working conditions

There are two types of tobacco plants:

Virginia (VT): Used to make cigarettes. Contains 1/4 to 1/3 the amount of nicotine as NVT.
Non-Virginia (NVT): Used for other products.

► Shade tobacco: Grown in the Connecticut River Valley.

Varieties:
1) Connecticut Valley Shade Grown (cigar wrappers)
2) Connecticut Broadleaf/ Connecticut Havana Seed (cigar binders)

● Fields are covered with gauze or nets to shield tobacco plants from direct sunlight.
● Plants grow up to 7 feet tall with leaves up to 2 feet in length.
● Methods used to cultivate and harvest this tobacco differ significantly with methods used to cultivate and harvest cigarette tobacco:
  - Less wet conditions: Shade tobacco leaves cannot be blemished. They blemish easier when the plants are wet, so workers rarely harvest wet tobacco leaves.
  - Less dermal contact: After leaves are picked, they are balanced briefly on the forearm, and then transferred to a conveyor (not held under arm).


► Burley tobacco: Primarily grown in Kentucky and Tennessee.

● Contains 13% more nicotine than flue-cured tobacco.
● Harvested by the stalk - The entire stalk is cut off at the bottom of the plant.
  - Less dermal contact: Stalk is briefly held by hand or on forearm (not held under arm).

► Flue-cured tobacco: Primarily grown in North Carolina, South Carolina, Virginia, and Georgia.

● Harvested by individual leaves - Workers pick leaves in groups of 3 throughout the season, starting from the bottom of the plant.
  - More dermal contact: Leaves stored under arm.

Burley and Flue-cured tobacco account for 94% of all tobacco grown in the US.


Commodities-Tobacco
Irritant Injuries—Diagnoses and contributing factors
Make up 43% of work-related injuries of tobacco workers

Most Common Irritant Diagnoses:

- Dermatitis: 30%
- Allergies: 28%
- Eye: 26%
- Skin - general: 21%
- Trauma: 18%
- Head: 5%
- Throat: 5%
- Hand: 5%
- Chest: 8%
- Back: 5%

Contributing Factors of Irritant Injuries:

- Weather Conditions: 32%
- Inadequate protective gear: 29%
- Environmental exposure: 15%
- Carrying object: 4%
- Grasp/pick/pull: 4%
- Repetitive motion: 4%
- Using tractor/trailer: 4%
- Bending/Stooping: 4%
- Crop covered w/ poison ivy/oak/sumac: 4%

Part of Body with Irritant Diagnoses:

- Eye: 26%
- Skin - general: 21%
- Trauma: 18%
- Head: 5%
- Throat: 5%
- Hand: 5%
- Back: 5%
- Chest: 8%

Unknown: 2%
Infection: 6%
Dehydration: 2%
Sprain/Strain: 2%
Burn: 2%
Infection: 6%
Dermatitis: 30%
Allergies: 28%
Eye: 26%
Skin - general: 21%
Trauma: 18%
Head: 5%
Throat: 5%
Hand: 5%
Back: 5%
Chest: 8%
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Inadequate protective gear: 29%
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Carrying object: 4%
Grasp/pick/pull: 4%
Repetitive motion: 4%
Using tractor/trailer: 4%
Bending/Stooping: 4%
Crop covered w/ poison ivy/oak/sumac: 4%
Weather Conditions: 32%
Irritant Injuries - Dermatitis

30% of diagnoses for irritant injuries

► 90% of most cases of occupational dermatitis are contact dermatitis.
► Contact dermatitis is the most common occupational illness in the US.

Irritant Contact Dermatitis: Most prevalent form of contact dermatitis. Occurs when a compound comes into direct contact with the skin, often more than once.
► Caused by contact with acids, alkaline materials, solvents, or other chemicals.
► Working around moisture, dirt, detergents, and chemicals increases risk.
► With enough exposure to the chemical, anyone can develop a reaction.
► Characterized by erythema and unilocular bullae, resulting from epithelial necrosis.
► Reaction usually resembles a burn.
► May result in irritant conjunctivitis

Allergic Contact Dermatitis: Less prevalent. Requires a sensitized immune system. Most common plant causing this reaction is poison oak/ivy.
► Immune system must be sensitized to a chemical or material prior to reacting (not everyone reacts to certain chemicals).
► Skin reaction usually takes over 24 hours to develop and can last for a few weeks.
► Acute allergic contact dermatitis is characterized by microvesicles.
► Skin inflammation varies from mild irritation and redness to open sores.

Common cause of allergic contact dermatitis: Poison Ivy/Oak/Sumac

- Urushiol is the chemical in the sap of poison ivy and oak plants that causes a rash, blisters, and an itch.
- Growers often spray herbicides beneath plants to keep undergrowth closely cropped. Poison ivy is immune to many of these chemicals, so competition from other plants is eliminated and poison ivy can spread freely.

Treatment:
- Immediately cleanse exposed skin with rubbing alcohol (alcohol removes the skin’s protection along with the urushiol).
- Wash skin with water.
- Take a shower with soap and warm water.
  ► Do not use soap before this point because it will pick up some urushiol from the surface of the skin and spread it around.
- Any tools, clothes, shoes, or other items that came into contact with the urushiol should be wiped off with alcohol and water.

Available online at: http://pediatrics.about.com/cs/conditions/a/poison_ivy.htm

Photographs from http://www.dermnet.com
Intoxication Injuries—*Green Tobacco Sickness (GTS)*

**Characteristics, factors**

► The surface of wet tobacco leaves contain nicotine, and dermal contact causes absorption.
► 24% of tobacco workers have GTS at least once a year.
► Workers experience about 2 days of illness for every 100 days at risk.

**Characteristics of GTS**

► GTS usually occurs in the afternoon or evening (several hours after exposure).
► Dermal absorption of nicotine, an alkaloid, may cause the following:
  ► Either stimulate or desensitize receptors in the autonomic ganglia and peripheral nerve endings, **causing nausea, vomiting, and variable effects on blood pressure and heart rate**.
  ► Increases release of epinephrine by the adrenal gland, **causing increased blood pressure and heart rate**.
  ► Acts directly on brain causing generalized stimulation, tremor, and activation of emetic hemoreceptor trigger zone, **causing vomiting**.

**Generally, GTS is diagnosed if a patient is experiencing nausea or vomiting, AND headache or dizziness, and has worked in tobacco that day or the previous day.**

► Other symptoms may include abdominal cramps, headache, prostration, difficulty breathing, abdominal pain, diarrhea, and fluctuations in blood pressure or heart rate.
► GTS is normally self-limiting, but a case may be severe enough to result in dehydration. Emergency medical care may be needed.

**Factors of GTS**

► **Task:** The graph to the right shows which tasks provide the highest and lowest risk for GTS. Those whose dominant task is priming are most at risk, and may have GTS 4 days per 100.
► **Experience:** Those who have worked in tobacco for over 5 years have GTS an average of .87 days per 100, while those who have worked in tobacco for 2 to 4 years have GTS 2.3 days per 100, on average. Young age has been found to increase the risk of GTS.
► **Season time:** There is a 10.9% chance of a worker having GTS in the late season versus a 3.6% chance in the early season.
► **Clothing protection:** Wearing rubberized nylon rainsuits effectively prevents nicotine absorption in tobacco workers, although they are hot and uncomfortable.
► **Glove protection:** Use of rubber gloves provides protection against nicotine absorption among 93% of tobacco workers, while cotton gloves protect 78.5% of tobacco workers. Rubber gloves are less comfortable but more durable than cotton gloves.
► **Working in wet clothes:** The chance of having GTS for those wearing wet clothes over 25% of the time is twice as high as it is for those wearing wet clothes less than 25% of the time.
► **Smoking:** Nicotine from nonskin sources such as smoking may reduce transdermal nicotine adsorption by regulating vasodilation.


Commodities-Tobacco

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Intoxication Injuries—**Green Tobacco Sickness (GTS)**

► Over half of tobacco workers report taking no precautions to prevent GTS.
► 96.4% of those who reported GTS took one or more actions to treat the symptoms.
► Typical treatments used by farmworkers are shown to the right.
► The most common prevention methods include smoking, wearing protective gloves/clothing, changing out of wet clothing, drinking lemon juice, and various herbal remedies. Although smoking appears to lower the number of GTS cases, it’s inadvisable because of a greater health risk associated with tobacco use.

**GTS protection and treatment methods for tobacco farmworkers:**
► If possible, avoid handling wet tobacco.
► Plastic or rubber protective aprons or rainsuits will reduce dermal nicotine absorption, but watch for signs of heat stress.
► Chemical resistant gloves, such as those recommended for pesticide mixing, will protect workers’ hands from nicotine absorption. See glove pictures below.
► Changing into dry clothes after a worker’s clothing becomes completely wet with moisture from the tobacco plants will help reduce nicotine absorption.
► Over-the-counter medicines may help treat symptoms of GTS, but they should only be taken while not working because their side effects may be dangerous in the workplace.
► Cleansing the skin with cold water (hot water may hasten the absorption of nicotine) to remove tobacco sap may help alleviate symptoms.


![Gloves before and after working with tobacco]

► Generally, medication is prescribed that alleviates nausea and vomiting (antiemetics).
► Prochlorperazine or dimenhydrinate had previously been recommended for fast relief, but it has been more recently inferred that GTS is due to nicotinic stimulation of ganglionic cholinergic receptors. Therefore, the antihistamine dimenhydrinate (producing anticholinergic effects) or oral diphenhydramine have been thought to be effective in alleviating symptoms.


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