

Aitkin County Board of Commissioners
Request for County Board Action/Agenda Item Cover Sheet



To: Chairperson, Aitkin County Board of Commissioners Date: 4-2-13
Via: Patrick Wussow, County Administrator
From: Patrick Wussow, County Administrator

Title of Item:
Request for Central Planes Aviation to Spray for Army Worms

Requested Meeting Date: 4-9-13 Estimated Presentation Time: _____

Presenter: Patrick Wussow, County Administrator

Type of Action Requested (check all that apply)

- For info only, no action requested
- For discussion with possible action
- Let/Award Bid or Quote (attach copy of basic bid/quote specs or summary of complex specs, each bid/quote received & bid/quote comparison)
- Approve/adopt proposal by motion
- Authorize filling vacant staff position
- Request to schedule public hearing or sale
- Request by member of the public to be heard
- Item should be addressed in closed session under MN Statute _____
- Approve under Consent Agenda
- Adopt Ordinance Revision
- Approve/adopt proposal by resolution (attach draft resolution)
- Other (please list) _____

Fiscal Impact (check all that apply)

Is this item in the current approved budget? Yes _____ No _____ (attach explanation)
What type of expenditure is this? Operating Capital Other (attach explanation)
Revenue line account # that funds this item is: _____
Expenditure line account # for this item is: _____

Staffing Impact (Any yes answer requires a review by Human Resources Manager before going to the board)

Duties of a department employee(s) may be materially affected. Yes No
Applicable job description(s) may require revision. Yes No
Item may impact a bargaining unit agreement or county work policy. Yes No
Item may change the department's authorized staffing level. Yes No



Supporting Attachment(s)

- Memorandum Summary of Item
- Copy of applicable county policy and/or ordinance (excerpts acceptable)
- Copy of applicable state/federal statute/regulation (excerpts acceptable)
- Copy of applicable contract and/or agreement
- Original bid spec or quote request (excluding complex construction projects)
- Bids/quotes received (excluding complex construction projects, provide comparison worksheet)
- Bid/quote comparison worksheet
- Draft County Board resolution
- Plat approval check-list and supporting documents
- Copy of previous minutes related to this issue
- Other supporting document(s) (please list) _____

Provide (1) copy of supporting documentation NO LATER THAN Wednesday at Noon to make the Board's agenda for the following Tuesday. (If your packet contains colored copies, please provide (4) paper copies of supporting documentation as we do not have a color printer or copier.) Items WILL NOT be placed on the Board agenda unless complete documentation is provided for the Board packets.

AITKIN COUNTY ADMINISTRATION

Aitkin County Courthouse
217 Second Street N.W. Room 130
Aitkin, MN 56431
218-927-7276
Fax: 218-927-7374

TO: Aitkin County Board of Commissioners

FROM: Patrick Wussow, Aitkin County Administrator

RE: Resident Request to Authorize County Board Chairman to Sign Authorization Letter For FFA Congested Area Agricultural Dispensing.

DATE: April 2, 2013

The County is in receipt of a request from Richard Rees to allow Central Planes Aviation to spray, by means of aerial application, to control army tent caterpillars. The County Board is being asked to authorize the County Board Chairman to sign a letter authorizing the operation under a congested area permit for the FAA and Department of Agriculture.

In addition to the written request from Mr. Rees, staff was approached by property owners on Lake Mille Lacs about obtaining approval to allow the aerial spraying. This would lead staff to believe that other property owners throughout Aitkin County will utilize this service.

Staff is aware that this could potentially be a controversial topic so we have taken the extra steps to confirm that the applicant is a property owner in Aitkin County, and that Central Planes Aviation has in the past and currently is authorized to operate/spray in Stearns and Morrison Counties. Additionally, the State does require them to post prior to spraying.

Information from the DNR states that they are willing to provide information to property owners. I spoke with Mr. Rees and he indicated that they have talked with representatives from the DNR.

Included for your review is a copy of the request from a property owner, the business owner of Central Planes Aviation Inc., a copy of the FAA and Department of Agriculture Congested Area Operations Plan guidelines, a Department of Natural Resources online guide on forest tent caterpillars, and a draft letter of approval for review.

Action necessary, is to authorize the Chairman of the County Board to sign the attached letter.

Please contact me with questions.

MAR 25 2013

Richard Rees
3549 Humboldt Av. So.
Mpls. MN. 55408
612 822-3765
reesminneapolis@aol.com

Patrick Wussow
217 2nd St. N.W.
Aitkin MN. 56431

Dear Sir:

As per our phone conversation on March 22nd, I am submitting a written request to perform an aerial spraying of Farm Island at Farm Island Lake for the purpose of controlling army tent caterpillars. We experienced a large enough outbreak last year to suggest that 2013 may be much worse. The worms usually appear around Memorial Day, and if we determine that spraying is necessary, we have been in contact with John Rikard at Central Plains Aviation. He appears to have the necessary equipment, knowledge, and materials to do the job successfully.

I have been serving as president of our Island club for a number of years and represent a group of 19 island residents, all of whom are in favor of controlling this infestation. You had mentioned that this matter would be considered at the April 9th meeting. Please let me know if my presence might be helpful or required.

Thank you for your consideration;



Hazelton

11-1-123300

Central Planes Aviation Inc
39115 Co Road 186
Sauk Centre, Mn. 56378
320-352-3013

Aitkin County Commissioners,

My name is John Ricard. I am the owner of Central Planes Aviation Inc. based at the Sauk Centre Airport. In the last few years the area around some of the lakes in central Minnesota have been overrun by army worms that are quiet destructive to land owners trees. Some of the lake associations have contacted us to do some spraying for these insects. We did some areas in Stearns, Todd, and Morrison Co., last few years and would like to include Aitkin County for the year 2013.

The Chemical that we use is a BT product called Dipel ES. The DNR is using this chemical for the Gypsy moth program in northern Minnesota. This chemical is only affective on worms that eat leaves and will not harm wildlife or fish. It is also cleared on organic crops.

To do this type of control we have to operate under a congested area permit approved by the FAA and the Department of Agriculture.

We need a written approval from the governing body of each Co. that we can include in our application and send to Dave Egesdal in the Minneapolis Flight Standards District Office (612) 253-4507, for approval.

We ask that the Board review our request at your next meeting. I've included a simple letter that would need to be signed by one of the board members that I would include with my permit application.

Also Included is the FAA format that we are following for the permit. I've highlighted the area that involves the Co approval.

Central Planes Aviation Inc. has been doing aerial application in Central Mn. since 2003, and is fully insured and licensed. Aitkin Co. will not be held liable for any actions of my company. Any questions please feel free to call (320) 352-3013.

Sincerely: John Ricard 
CEO - Central Planes Aviation Inc.

1/15/09

8900.1 CHG 46

VOLUME 3 GENERAL TECHNICAL ADMINISTRATION**CHAPTER 52 PART 137 AGRICULTURAL AIRCRAFT OPERATIONS****Section 2 Evaluate a Part 137 Congested Area Operations Plan****3-4256 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODE. 1332**

3-4257 OBJECTIVE. The objective of this task is to determine that a public aircraft or Title 14 of the Code of Federal Regulations (14 CFR) part 137 operator can conduct agricultural dispensing operations safely over a congested area, according to an approved plan. Successful completion of this task results in either approval or disapproval of an operator's proposed plan.

3-4258 GENERAL. Agricultural aircraft may operate over congested areas when:

- The local Flight Standards District Office (FSDO) has approved the congested area plan, and
- The appropriate official or governing body of the political subdivision over which the aircraft is to be operated has approved the operation in writing.

A. Appropriate Officials. An appropriate elected public official or governing body can include any of the following:

- 1) Mayor,
- 2) City Manager,
- 3) City Council,
- 4) County Board of Supervisors,
- 5) County Commissioner, or
- 6) Any other similar elected public official.

B. Public Notice. If time allows, the public notice required by part 137, § 137.51(b)(2) should be given at least 48 hours before dispensing operations begin. The form that the public notice takes is up to the operator. Newspaper ads, radio announcements, television announcements, or door-to-door handbills are all acceptable methods.

C. Contents of Congested Area Plan. Consider the following when reviewing the plan of operation required by § 137.51(b)(3) and submitted by the operator.

1) The congested area plan must include an aerial photograph, large scale map, or computer generated map or diagram of the area to be worked. Whichever depiction is used, it should be appropriately marked to show all obstructions which could be expected to present a hazard during the operation and the areas which could be used for an emergency landing and dumping of agricultural materials.

2) The photograph, map, or diagram must be current, preferably within the preceding 24 months, to be considered representative of the area. If current photographs or diagrams are not available,

realtor's maps may be used to supplement. The important aspect is not to accept maps that are not drawn to scale.

D. Assisting Operators. Occasionally agricultural aircraft operators may request Federal Aviation Administration (FAA) assistance in determining whether an area is congested or not. Before the FAA can determine this, the site will have to be checked. The FAA cannot, of course, check every area an operator wants to service, but in some cases an operator needs legitimate assistance. The inspector must use judgment in determining the status of an area as congested or not. If the inspector has any doubt, he or she should consult with other inspectors or regional counsel for any precedent.

3-4259 SINGLE-ENGINE AIRCRAFT. When congested area operations are conducted using single-engine aircraft, the inspector shall require the operator to arrange with appropriate officials of the area concerned to take such measures as are necessary to conduct the operation safely. These may include blocking off streets and other areas which could be used as an emergency landing or similar precautionary measures required in the interest of public safety. Before approving any operator's plan of operation, the inspector shall determine that the plan complies with the emergency landing requirements contained in § 137.51(b)(4)(iii).

3-4260 MULTI-ENGINE AIRCRAFT.

A. Takeoff Performance. If the operator intends to takeoff over a congested area, they must show in the congested area plan that the airplane can meet the accelerate-stop requirements of § 137.51(b)(5)(i). If the aircraft cannot meet these requirements, the operator must state in the written plan of operation that no takeoff will be made over a congested area during dispensing operations.

B. Critical Engine Inoperative. The operator must show in the congested area plan that the airplane can meet the climb requirements specified in § 137.51(b)(5)(ii).

3-4261 RESTRICTED CATEGORY AIRCRAFT. Title 14 CFR part 21, or the operating limitations established for the airplane, may not require a flight manual for restricted category aircraft. Therefore, performance information may be found in the applicable military technical order, operating limitations, placards, flight test performance data established by the aircraft manufacturer, or any combination thereof. In addition, performance information provided by a Designated Engineering Representative is satisfactory. If such performance information has not previously been established for the airplane to be used or, if any doubt exists concerning the authenticity of the information presented by the operator, a Manufacturing Inspection District Office (MIDO) should be contacted to arrange for an engineering flight test in order to obtain the required performance data.

A. Load Jettisoning. Aircraft, other than a helicopter, must be equipped with a device capable of jettisoning at least one-half of the aircraft's maximum authorized load of agricultural material within 45 seconds (part 137, § 137.53(c)(2)).

B. Data Not Determined. If such data have not been determined for the aircraft or, if any doubt exists concerning meeting this requirement, the inspector should have the operator conduct an in-flight load jettisoning demonstration.

C. Test Conditions. The aircraft must be loaded with any suitable material (lime, sand, water, etc.) and the demonstration shall be observed by the inspector from the ground. The discharge of material from the aircraft should be timed to determine compliance with the 45-second jettisoning requirement.

D. Preventing Inadvertent Jettisoning. Part 137, § 137.53(c)(2) requires that aircraft

conducting agricultural operations over congested areas must have a means of preventing inadvertent jettisoning of the tank or hopper. This can be accomplished with a device such as:

- 1) Spring-loaded cover over a pull lever,
- 2) "T" handle or pull ring in a spring loaded shield,
- 3) A push-pull device fastened with fine safety wire, or
- 4) Other equivalent devices.

3-4262 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. This task requires knowledge of the regulatory requirements of part 137 and FAA policies and qualification as an aviation safety inspector (ASI).

B. Coordination. This task may require coordination with the airworthiness unit, the regional counsel, state, county, or local authorities.

3-4263 REFERENCES, FORMS, AND JOB AIDS.

A. References:

- 14 CFR parts 1, 61, 91, and 137, and
- Advisory Circular (AC) 137-1, Agricultural Aircraft Operations.

B. Forms:

- FAA Form 1360-33, Record of Conference, Visit, or Telephone Call, and
- FAA Form 8000-36, Program Tracking and Reporting Subsystem Data Sheet.

C. Job Aids. None.

3-4264 PROCEDURES. After a part 137 operator requests district office approval for a congested area operation, determine the need for congested area plan based on location, type of operation, etc. (§ 137.51 (b)).

A. Plan Not Required. If a plan is not required, record discussion on FAA Form 1360-33 and place it in the operator's district office file. Do not open a PTRS file.

B. Plan Required. If a plan is required, requirements of §§ 137.51 and 137.53 are as follows:

- 1) Instruct the operator to present the plan to the district office for review.
- 2) Remind the applicant of the requirement to coordinate with the appropriate state, local, or municipal authorities (§ 137.51(b)(1)).
- 3) Discuss with the applicant various methods of public notification, such as newspapers, radio, and handbills (§ 137.51(b)(2)).

C. PTRS. Open PTRS file.

D. Plan Requirements. Upon receipt of the operator's plan, ensure that the operator has

included the following information:

- 1) A current aerial photograph, current map, or a recently drawn diagram of the area to be worked;
 - Any representation must show all obstructions which may present hazards during operation.
 - Potential areas for emergency landing or dumping of agricultural materials must also be indicated.
- 2) Altitudes to be maintained, approaches, departures, and turnaround considerations during operation.
- 3) Name and type of material to be dispensed;
- 4) Type of pest or work to be accomplished;
- 5) Dates and hours of dispensing operations;
- 6) Coordination with air traffic control.
- 7) Special operating procedures or limitations to ensure safe operations.
- 8) Method of public notification;
- 9) An indication of coordination with the appropriate state, local, or municipal authorities (Figure 3-144); and
- 10) Methods for complying with §§ 137.51(b)(4) and (5) and 137.53(c)(2).
 - Arrangements for blocking off streets and other areas which may be used for emergency landings.
 - Observe the load jettisoning demonstration from the ground if jettisoning test data is not available or in doubt. For multiengine aircraft, refer to § 137.51(b)(5).
- 11) Means for terminating the operation in the event it appears safety may be compromised or at the inspector's discretion.

E. Pilot Qualifications. The plan must indicate the qualifications (part 61 and § 137.53) of the pilot to be used in the operation.

F. Aircraft Requirements. The plan must include information which indicates that the aircraft meets the requirements of part 91, and part 137, §§ 137.31, 137.33, 137.51, and 137.53.

G. Plan Approved. When the plan meets all 14 CFR requirements, all safety considerations, and appropriate coordination requirements, approve the plan using template A503 in the OPSS. Each page of the plan is stamped "FAA-Approved," dated, and signed by the principal operations inspector (POI).

- 1) Forward a copy of the approved plan to the operator.
- 2) Place a copy of the plan in the district office file on the operator.

H. Plan Not Approved. If the plan cannot be approved, issue a letter disapproving the congested area plan (Figure 3-146).

I. PTRS. Make appropriate PTRS work entry.

3-4265 TASK OUTCOMES. Completion of this task results in either:

- An approved congested area plan, or
- Issuance of a letter disapproving the congested area plan.

3-4266 FUTURE ACTIVITIES.

A. Monitoring.

1) Schedule monitoring of congested area plan if the task is in work program plans.

2) Monitor congested area plan (see Volume 6, Chapter 6, Section 4, Monitor a Part 137 Congested Area Operation).

B. Enforcement. Possible enforcement investigation if the operation is not conducted according to the approved plan or is unsatisfactory in any other manner. Use the approved plan as information for a subsequent enforcement investigation.

C. Review. Review of any subsequent congested area operations.

Figure 3-144, Sample Letters Indicating Coordination With Appropriate Authorities

(To Agricultural Aircraft Operator)

[Operator's name and address]

I, [name], the [title of individual and name of town] grant permission to [name of operator] to fly over the town of [name of town] for the purpose of [state purpose of operation] from an agricultural aircraft on [date of operation].

[official's signature]

(To Federal Aviation Administration)

[Operator's Letterhead]
 [Date]

[Name and address of district office]

Sir/Ma'am:

[Name of operator] will conduct the dispensing operation, described on the attached diagram, per Title 14 of the Code of Federal Regulations § 137.51. The aircraft used will be a [make and model of aircraft and N number].

The dispensing operation will be conducted at no less than [altitude] feet above ground level. The

airspeed will be [speed in knots or mph].

[Chemical name] will be dispensed at the rate of [number of gallons] per acre.

The operation will be conducted from [beginning date] to [ending date].

The public will be notified of the operation [indicate methods of notification] on [date].

Sincerely,

[Operator's signature]

Figure 3-145, Letter Approving Congested Area Plan. Use OPSS template A503.

Figure 3-146, Letter Disapproving Congested Area Plan

[FAA Letterhead]

[Date]

[Operator's name and address]

Dear [operator's name]:

This is to inform you that the congested area plan, which you submitted on [date], for agricultural aircraft operations over [congested area, city, or town] is not approved.

The following items were unsatisfactory:

[List the items and how they must be corrected.]

If you have any questions concerning this matter or intend to take action to correct these items, please contact this office at [telephone number].

Sincerely,

[POI's signature]

RESERVED. Paragraphs 3-4267 through 3-4285.

Patrick Wussow

From: Mark Jacobs <mjacobs@co.aitkin.mn.us>
Sent: Friday, March 29, 2013 9:05 AM
To: 'Waller, Alice (MDA)'
Cc: 'Reed, Rian H (DNR)'; 'Albers, Mike (DNR)'; 'Sargent, Kay (MDA)'; 'Wicks, Christine (MDA)'; 'Patrick Wussow'
Subject: RE: forest tent caterpillars and aerial sparying

Thank you.

Mark Jacobs
Land Commissioner
Aitkin County Land Department
209 2nd St. NW Room #206
Aitkin, MN 56431
P: 218-927-7367
F: 218-927-7249

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From: Waller, Alice (MDA) [<mailto:alice.waller@state.mn.us>]
Sent: Friday, March 29, 2013 9:00 AM
To: mjacobs@co.aitkin.mn.us
Cc: Reed, Rian H (DNR); Albers, Mike (DNR); Sargent, Kay (MDA); Wicks, Christine (MDA)
Subject: forest tent caterpillars and aerial sparying

Dear Mr. Jacobs,

Thank you for contacting the Minnesota Department of Agriculture (MDA) regarding the aerial application to forested areas. Minnesota Statutes, Ch 18B governs the application of pesticide in Minnesota. The law allows for the aerial application of pesticide provided the applicator has a valid license with appropriate category and the pesticide label does not prohibit aerial application.

Section 18B.07 governs the use of pesticide, and includes provisions to aeriially apply pesticide to a forested area please follow the link <https://www.revisor.leg.state.mn.us/statutes/?id=18B.07> . As you will note, there are some limitations to spraying areas where people are present, and there are provisions for notification. Please review 18B.07 Subd. 2 and note that a person may not direct a pesticide onto property beyond the boundary of the target site; a person may not directly apply a pesticide on a human by overspray or target site spray except when the pesticide application is for control of gypsy moth, forest tent caterpillar or other pesticide species, and the pesticide use is a biological agent.

Ch 18 B.07 further limits the application of a biological agent to control forest tent caterpillar by requiring no practicable and effective alternative method of control exists, that the pesticide is among the least toxic available for control of the

target pest and that notification of residents in the area to be treated is provided by direct notification and through publication in a newspaper of general circulation within the affected area. The section also defines direct notification.

Please review MDA's pesticide applicator license page at <http://www.mda.state.mn.us/licensing/licensetypes/pesticideapplicator.aspx> for additional information on records and license requirements.

MDA has a process for citizens to complain about a pesticide application. MDA investigates complaints of misuse, so any person that believes they have damage, or believe a misapplication has occurred has the opportunity to request an inspection. Our complaint form is available on line at <http://www.mda.state.mn.us/chemicals/pesticides/complaints/pestfertmisuse.aspx>.

If you need additional information, please contact my office.

Sincerely,

Alice Waller
Licensing & Certification Unit
Pesticide & Fertilizer Management Division
Minnesota Department of Agriculture
625 Robert Street N
Saint Paul MN 55155-2538

phone: 651/201-6284
fax: 651/201-6105
alice.waller@state.mn.us

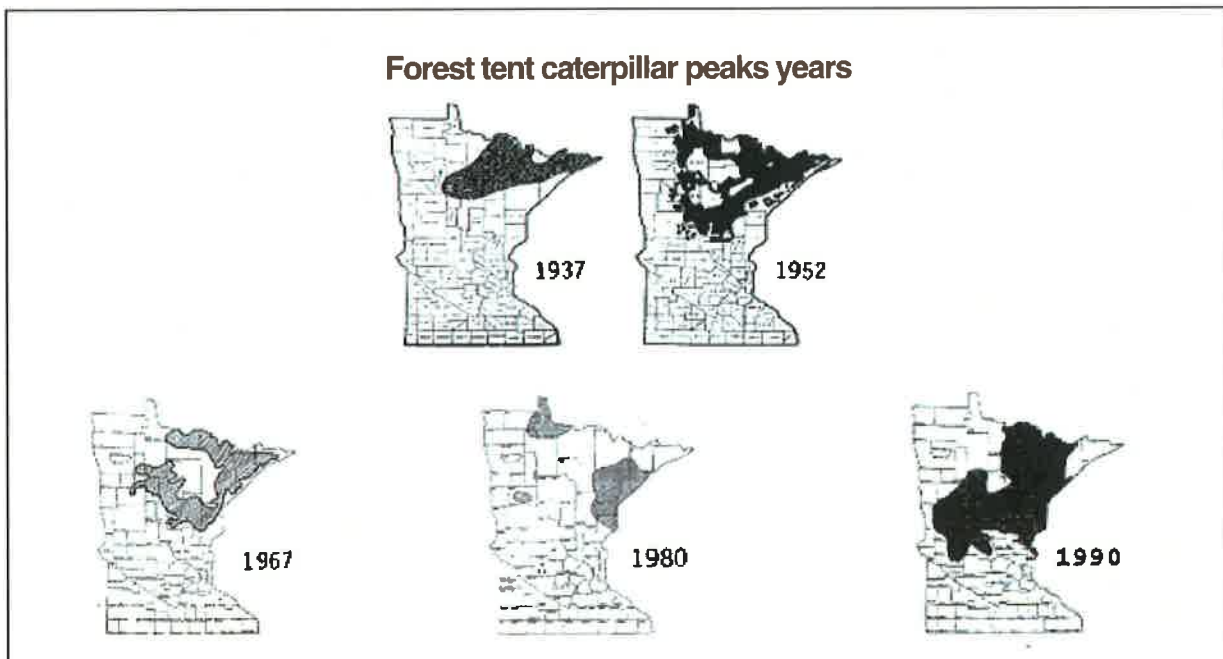
Forest tent caterpillars

The forest tent caterpillar (FTC), *Malacosoma disstria*, is a native defoliator of a wide variety of hardwood trees and shrubs. It is often mistakenly called the armyworm. Its range in North America extends from coast to coast and from the tree line in Canada to the southern states. These caterpillars feed primarily on **aspen** and **birch** trees in northern Minnesota and on **basswood** and oaks in central and southern Minnesota. The only hardwood **not** regularly fed on is **red maple**. When populations are high, FTC will even eat **tamarack** foliage during outbreaks.



Forest tent caterpillars

North-wide outbreaks of FTC occur at intervals of five to ten years and are five to eight years in duration. In the last 120 years, outbreaks peaked in 1891, 1898, 1912, 1922, 1937, 1952, 1967, 1978, 1990 and 2001. See maps of peak years defoliation below. In any given location, defoliation is usually noticed for two to four consecutive years.



Outbreaks can begin suddenly or develop slowly over a period of years. Outbreaks normally collapse quickly due to natural causes with defoliation reduced by as much as 80 percent in a single year. Defoliation starts in late May in central Minnesota and early June in northern areas. Defoliation will normally be obvious by mid-June and finished by late June.

In west-central counties, FTC populations may synchronize with northern outbreaks or they may have small, localized outbreaks that pop up and collapse quickly. These outbreaks occur in oaks, basswoods and aspens on lakeshores and cover a relatively low number of acres.



2001 northern outbreak map

FTC Nuisance

During outbreaks, forest tent caterpillars can number from one to four million caterpillars per acre. They create an extreme nuisance to people living or vacationing in forested areas. Young caterpillars spin threads and fall from the trees onto picnic tables, patios, and people, causing serious annoyance. Large, mature caterpillars wander widely in search of food and often appear to migrate across roads and open areas. Resting caterpillars commonly form large clusters of thousands of caterpillars on buildings, tree stems, cars, campers, and other stationary objects. Caterpillars often emit a greenish-black fluid when disturbed that stains paint and cloth. During the height of defoliation, insect frass (excrement) becomes a serious nuisance as it rains down from insects feeding in the tree crown.

Mass flights of FTC moths are common during outbreaks. These flights can move millions of moths hundreds of miles creating a nuisance where the flight ends. Mass flights can trigger new outbreaks suddenly where the insect had not been a problem before. These flights are often associated with the passage of a cold front.



Forest tent caterpillars resting in large groups on an aspen.

Damage

In the forest, defoliation from FTC usually causes little damage to aspen tree health. Most trees develop a second set of leaves after attack, but these leaves are noticeably smaller and tend to cluster near the branch tips. The second year after the collapse of an outbreak, 80 percent of the trees have normal leaves. FTC defoliation reduces tree strength, but vitality recovers within a few years of the population collapse.

FTC defoliation reduces aspen stem growth. As defoliation intensity and duration increase, stem growth decreases. For example, a single light defoliation does not reduce growth. However, one heavy defoliation may reduce stem growth by 50 to 60 percent. Two years of heavy defoliation reduces growth 90 percent. Growth rate recovers quickly, returning to 80 percent of normal during the first year after the end of the outbreak.



Forest tent caterpillars feeding on aspen leaves.

Aspen trees usually do not die from FTC defoliation alone. A Minnesota study of the 1948 to 1956 outbreak documented the death of 396 aspen trees out of 4877 aspens. Identifiable problems other than FTC accounted for the death of all but four trees. So, in this instance, about one percent of the aspens died due to FTC defoliation alone.

FTC defoliation does weaken trees and makes them more susceptible to attack from a variety of other pests. These pests, called secondary pests, do more damage than the FTC and may kill the infested tree. Trees defoliated by FTC and are suffering stress from other factors, such as prolonged drought or defoliation due to late spring frosts, growing on poor sites or old age, are much more vulnerable to attack by secondary pests. Weakened aspen may die from subsequent attack by Poplar borer, Hypoxylon canker, or Armillaria root rot. Similarly, other hardwoods can be weakened by FTC defoliation. Commonly, oaks weakened by FTC defoliation and drought or root system damage suffer branch dieback or death from two-lined chestnut borer attack or Armillaria root disease.

Life Cycle

Forest tent caterpillar overwinters in an egg mass on twigs of host trees. The eggs are extremely hardy and easily survive Minnesota winters. It has been shown that less than 10 percent of the eggs are killed at -40° F and 50 percent survive at -50° F. Eggs hatch in the early spring about the time of bud break. The caterpillars have five growth stages, each stage lasting seven to ten days. During the early stages, caterpillars remain in clusters on the leaves.

Older caterpillars develop a deep blue velvet coloration with a sparse covering of long brown hairs. A line of white to cream colored spots runs down the back. These spots may look like footprints or a series of keyholes. As the caterpillars get larger, they consume increasing amounts of leaves and can wander widely in search of more food. They often drop from the defoliated twigs to the ground. Large caterpillars are solitary feeders, but commonly rest in large clusters. Mature caterpillars spin silk cocoons with white to yellow threads on vegetation, buildings and other stationary objects to begin pupation. This can occur from early to late June. The pupae form inside the cocoons. Adults emerge seven to ten days later. The adult moth is buff colored and has a broad brown band across the front wings. FTC moths are night fliers and are attracted to lights in large numbers. As a result of this, it is common to find high populations of FTC near populated areas and along highways.

After mating, the female moth lays 30 to 50 eggs in $\frac{1}{2}$ -inch long clusters and are wrapped around a twig. Each female lays 150 to 200 eggs. A tough, bronze-colored casing covers the egg mass and protects the eggs from drying out.

Forest tent caterpillars Life Cycle



Forest tent caterpillars egg mass on twig



Forest tent caterpillars

Forest tent caterpillars pupa inside its cocoon



Forest tent caterpillars as a adult moth

Natural Control

FTC is a native insect and has evolved in the forest ecosystem for thousands of years. Natural control mechanisms have also evolved which help to keep outbreaks from seriously damaging forested areas. A natural control mechanism that causes population collapse is starvation induced by the caterpillars' feeding. During the early stages of an outbreak, the trees have enough foliage to support the increasing number of caterpillars. After a year or two of complete defoliation, the large number of caterpillars need more foliage than is available. Starvation typically kills 75-95 percent of the caterpillars.

Late spring frosts that defoliate the trees have much the same effect. However, frosts hard enough to cause complete defoliation to all tree species at the same time are not common. Defoliating frosts force the young caterpillars to wait 7-10 days for refoiliation. Frost is the only factor that can cause a collapse during the first years of an outbreak.

Another significant natural control occurs near the end of the outbreak cycle. A **parasitic fleshly native to Minnesota**, *Sarcophaga aldrichi*, kills many FTC pupae in their cocoons. Although the fly often plays a significant role in the collapse of an outbreak, its population often increases to the point of becoming a nuisance to people.

Predatory beetles, ants, tree bugs, spiders, and small animals and birds feed on caterpillars and pupae, but the extent of their control is not known. Bacteria, fungus, protozoan and virus diseases become important late in the outbreak cycle. This is commonly due to the weakened state of the larvae as low-level starvation begins and is enhanced by the constant contact of the larvae with each other. Cool, wet spring weather also plays a role by slowing down the development rate of the insects while making disease transmission easier. A non-stinging wasp, *Itoplectis conquisitor*, is another important parasitoid of FTC pupae.



Adult friendly flies.



Forest tent caterpillars pupa inside its cocoon parasitized by larvae of the friendly fly.

Management

Since FTC has such a wide host range, silvicultural options are severely limited. Forestry practices such as thinning and pruning are not used in FTC management. Silvicultural actions are limited to planting non-host species such as red maple or conifers. In general, management options are limited to the acceptance of the growth loss and nuisance or to the improvement of tree vigor so that secondary pests do not attack the weakened trees. The use of insecticide treatments is usually limited to shade trees.

Insecticide Treatments

Forest tent caterpillar rarely causes severe damage to trees and, as a result, the forest does not normally need the protection of pesticides. Natural control systems cause the collapse of populations resulting in cyclical outbreaks.

Private landowners may desire or justify spraying in order to protect the trees and preserve their appearance. In making this decision, the landowners should consider their goals, environmental concerns and their ability to pay for the treatment. The DNR provides technical advice to landowners and landowner groups wanting to undertake control programs.

Insecticide treatments can be effective against defoliation by FTC. When applied while the caterpillars are small. It is difficult to achieve satisfactory control with insecticides on areas less than 10 acres or where less than 80 percent of the forested area will be treated. Several insecticides are registered for controlling the forest tent caterpillar including the biological insecticide, *Bacillus thuringiensis* var *kurstaki* (Btk). The DNR strongly recommends the use of Btk because of its environmental safety. Btk is a natural occurring bacteria effective against caterpillars that eat treated leaves. Btk has no effect on birds, people, other animals and most insects.

If you have any questions on or about the management of the forest tent caterpillar, please contact your **local DNR forester**.

References

Influence of the forest tent caterpillar upon the aspen forests of Minnesota by D.P. Duncan, A.C. Hodson, and A.E. Schneider. 1956. Office of Iron Range Resources and Rehabilitation, St. Paul, MN. 45 pages.

Numerical analysis of a forest tent caterpillar outbreak in northern Minnesota by John Witter, W. Mattson and Herb Kulman. 1975. The Canadian Entomologist Vol. 107:837-854.

Mass transport of forest tent caterpillar moths, Malacosoma disstria, by a cold front by Clifford E. Brown. 1965. The Canadian Entomologist Vol. 97:1073-1075

Cold-hardiness of the first instar larvae of the forest tent caterpillar, Malacosoma disstria, Lepidoptera: Lasiocampidae by A.G. Raske. 1975. The Canadian Entomologist Vol. 107: 75-80.

Heat units and outbreaks of the forest tent caterpillar by W.G.H. Ives. 1973. The Canadian Entomologist 105:529-543.



AITKIN COUNTY ADMINISTRATION

Aitkin County Courthouse
217 Second Street N.W. Room 130
Aitkin, MN 56431
218-927-7276
Fax: 218-927-7374

March 26, 2013

Mr. John Ricard
Central Planes Aviation, Inc.
39115 County Road 186
Sauk Centre, MN 56378

Re: Authorization to Operate Agricultural Aircraft over Unincorporated Areas of Aitkin County to Conduct Aerial Spraying of Tent Worm Caterpillars

Central Planes Aviation, Inc. has requested permission to operate agricultural aircraft over unincorporated areas of Aitkin County to spray for tent worm caterpillars using a Bt insecticide called Dipel.

Central Planes Aviation, Inc. is granted permission to operate agricultural aircraft over areas of Aitkin County while spraying for tent worm caterpillars per FAA waivers. Permission is granted with the following conditions:

1. It applies to only the unincorporated areas of Aitkin County;
2. Central Planes Aviation, Inc. must have a valid license to spray for tent worm caterpillars from the Minnesota Department of Agriculture;
3. This permission expires on December 31, 2013.

This authorization by Aitkin County is not an endorsement of this company. Central Planes Aviation, Inc. does not act on behalf or as an agent of Aitkin County.

Date _____

J. Mark Wedel, Chair
Aitkin County Board of Commissioners

Attest:

Patrick Wussow
Aitkin County Administrator
Clerk, Aitkin County Board of Commissioners