Risk Assessment of Fire Ants on Camp Joseph T. Robinson, Arkansas

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Introduction

- Grew-up on a Nebraska farm
- Bachelors Degree from University of NE

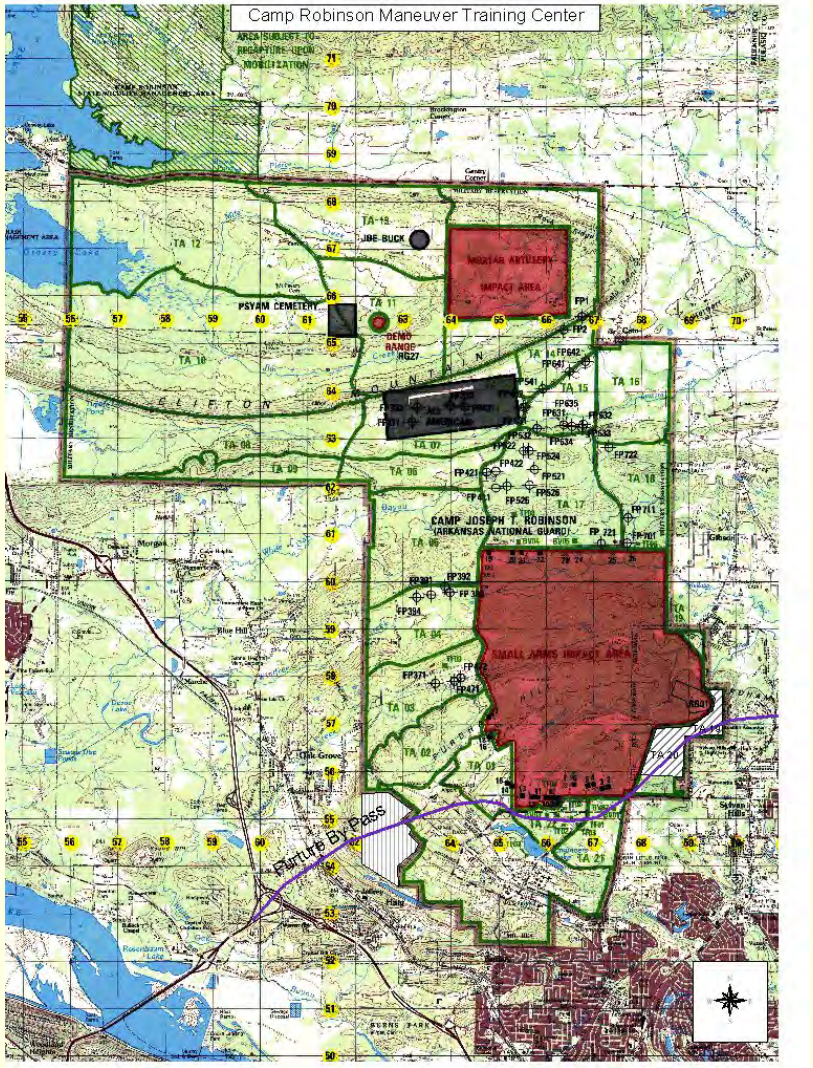
  -graduated from the Natural Resource College with a Wildlife Management Degree
- Currently work for the Military Department of Arkansas at Camp Joseph T. Robinson as a civilian
- Started at the Environmental Office and now work for Range Control

Camp Joseph T. Robinson

- Located in Central AR
- 33,000 acre State Owned Army National Guard Post
- The mission includes providing military training facilities for the Army and Air National Guard, DOD Active and Reserve components, along with other federal and state agencies

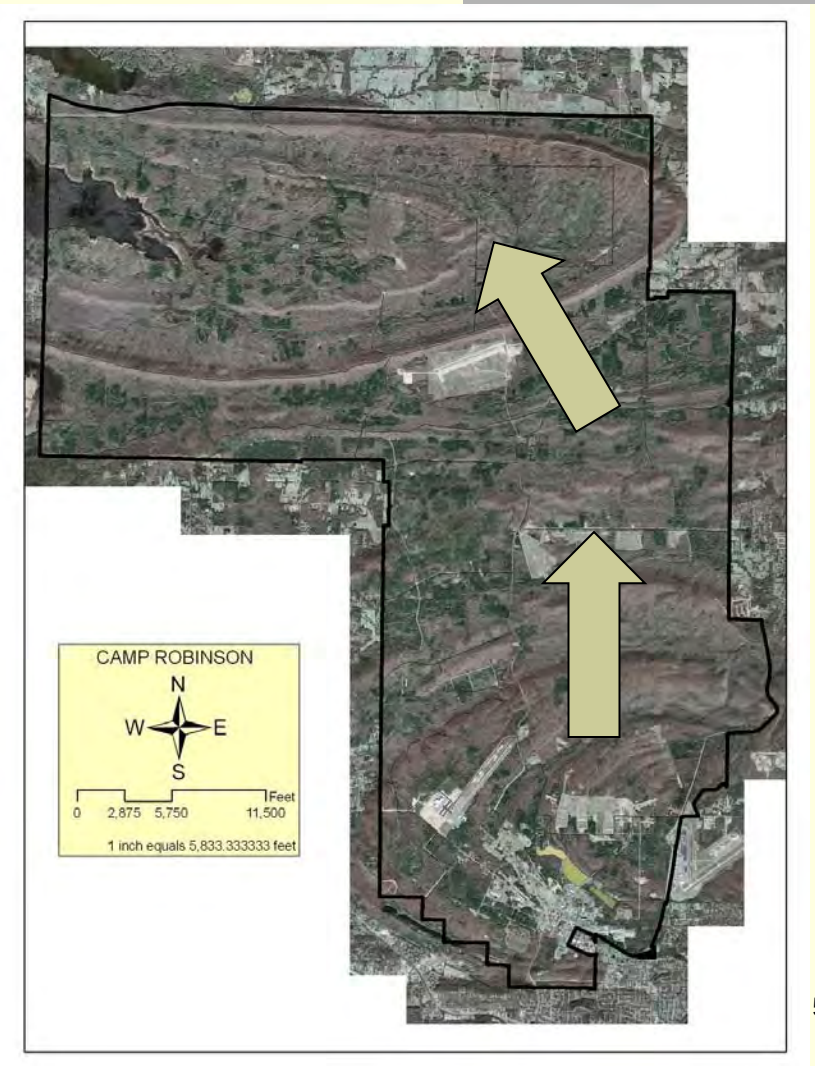
Camp Robinson Continued

- Majority of training occurs in the Impact Areas (6,445 acres)
- 23 Training Areas (22,918 acres)
- Cantonment Area (2,314 acres)

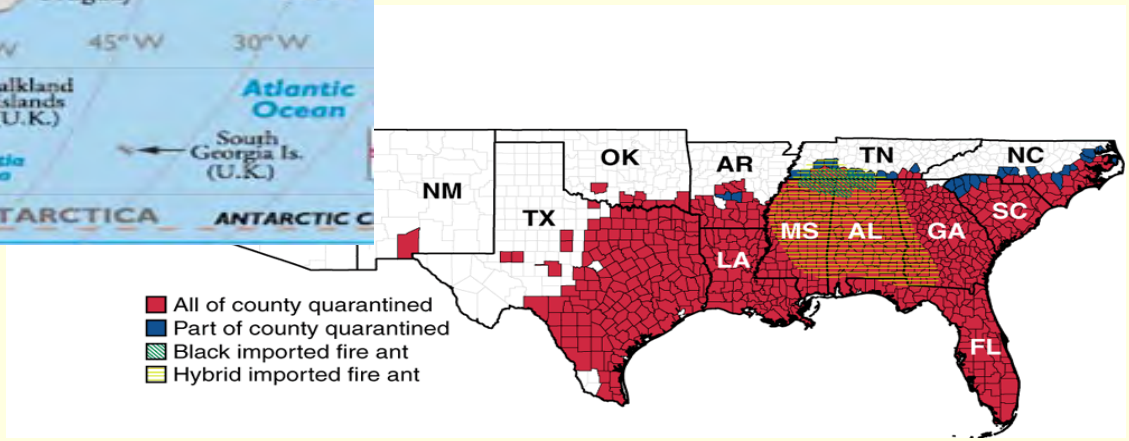


Fire Ants on Camp J.T. Robinson

- First Appeared in the Cantonment Area
- Spread to Small Arms Ranges
- Now found throughout post



History of Fire Ants



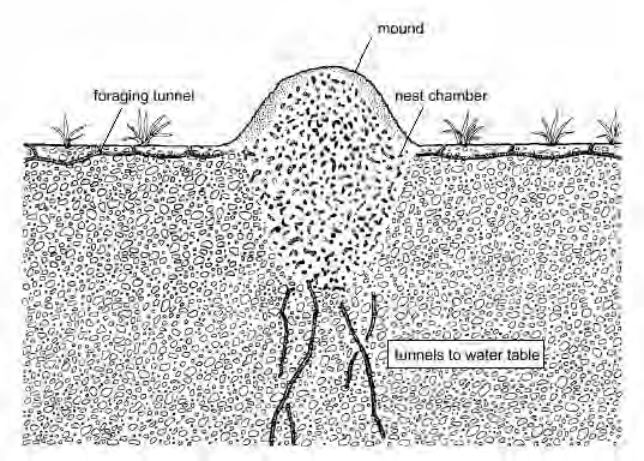
Identification of *Solenopsis invicta*

- Reddish-Brown to Dark Brown in color
- 1/8 to 1/4 inch long
- Mounds made of loose soil
- Disturbance of mound results in rapid defense

Behavior

- Aggressively defend mound running vertical up objects biting and stinging
- Uses mandibles to pinch up skin to insert stinger

Biology



- Subterranean nest with visible mounds
- Underground Galleries are a length of several feet and go to the water table
- Omnivorous and opportunistic feeders

Life Cycle

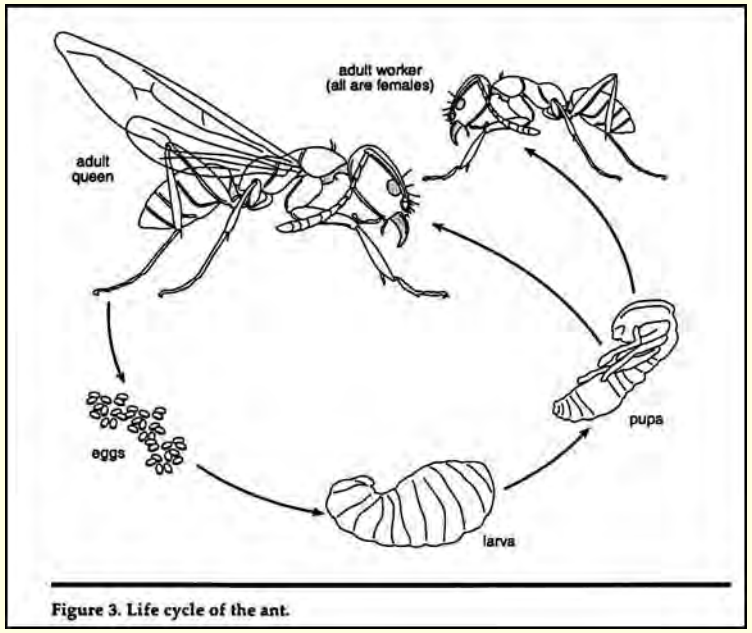


Figure 3. Life cycle of the ant.

- Four life stages:
  - eggs
  - larvae
  - pupae
  - adults

Reproduction

- Weather – cooler with increased moisture conditions
- Nuptial Flight – 500 feet in the air
- Colony type
  - Monogyne - 1 queen
  - Polygyne – many queens

Desired Habitat

- Sunny conditions
- Low or manicured vegetation
- Moist soil

Fire Ant Invasion Effects

- Decreases property value
- Sting humans and animals
- Reduced wildlife diversity

Military Hazard

Risk Assessment Objects

- **Identify fire ant hazards with tolerance levels**
- **Management plan with chemical controls and costs**

Risk Assessment Process

Hazard:

- Fire Ant (Stressor)
- Military Soldiers (Targets)

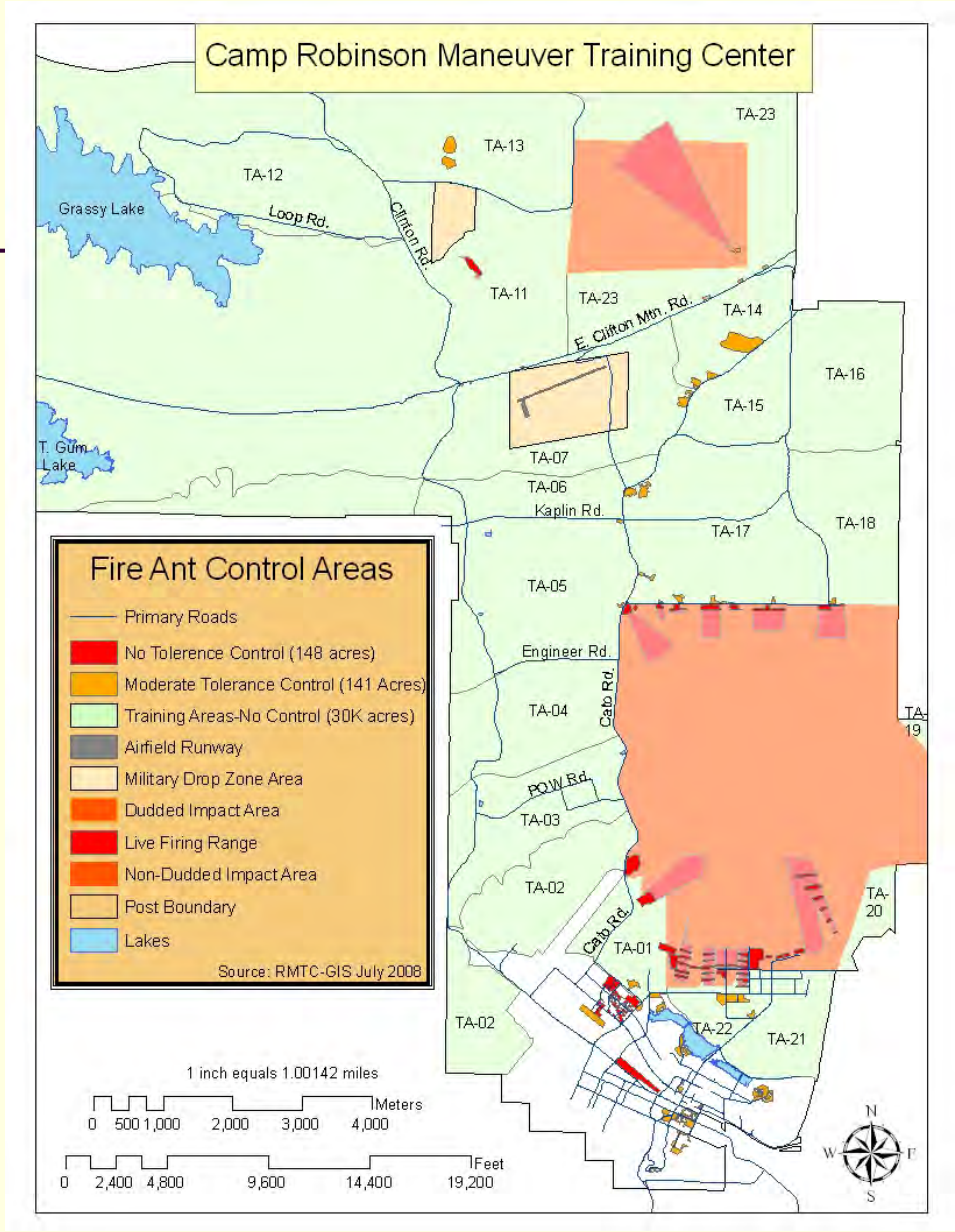
Analysis:

- 1st spatial occurrence vs. tolerance levels
- 2nd quantitative study of chemical control

Analysis Phase

Soldier Exposure Areas

- No Tolerance
- Moderate Tolerance
- Tolerant


Camp Robinson Maneuver Training Center
TA-23
TA-13
TA-12
Grassy Lake
Loop Rd.
Clifton Rd.
TA-11
TA-23
E. Clifton Mtn. Rd.
TA-14
TA-16
TA-15
T. Gum Lake
TA-07
TA-06
Kaplin Rd.
TA-17
TA-18
TA-05
Engineer Rd.
Cato Rd.
TA-04
TA-19
POW Rd.
TA-03
TA-02
TA-20
Cato Rd.
TA-01
TA-02
TA-22
TA-21
Fire Ant Control Areas
Primary Roads
No Tolerence Control (148 acres)
Moderate Tolerance Control (141 Acres)
Training Areas-No Control (30K acres)
Airfield Runway
Military Drop Zone Area
Dudded Impact Area
Live Firing Range
Non-Dudded Impact Area
Post Boundary
Lakes
Source: RMTC-GIS July 2008
1 inch equals 1.00142 miles
Meters
0 500 1,000 2,000 3,000 4,000
Feet
0 2,400 4,800 9,600 14,400 19,200
N
W
E
S

Chemical Control Treatments

- Amdro* Bait

  (A.I. Hydramethylnon 0.73%)

- Zep*Contact insecticide

  (A.I. Deltaethrin 0.05%)

Assessment Plots

- Plot Size:
  - 75 x 75 feet or 1/8 acres
  - Replications: 4
- Treatments:
  - Amdro
  - Zep
  - Combination
  - Control

Test Plots

Treatment	Rate	Application
Amdro	1.5 oz per plot	Broadcast
Zep	1 TBS per plot	Individual mound treatment
Combined Application	same as above	same as above
untreated	N/A	N/A

Pesticide Assessment

- Amdro bait was applied using a seed hand spreader

- Zep contact insecticide was sprinkled on mound and within a 18 diameter around mound

Active Mounds

- **Mound Disturbance**:

If > 20 ants surfacing
= Active

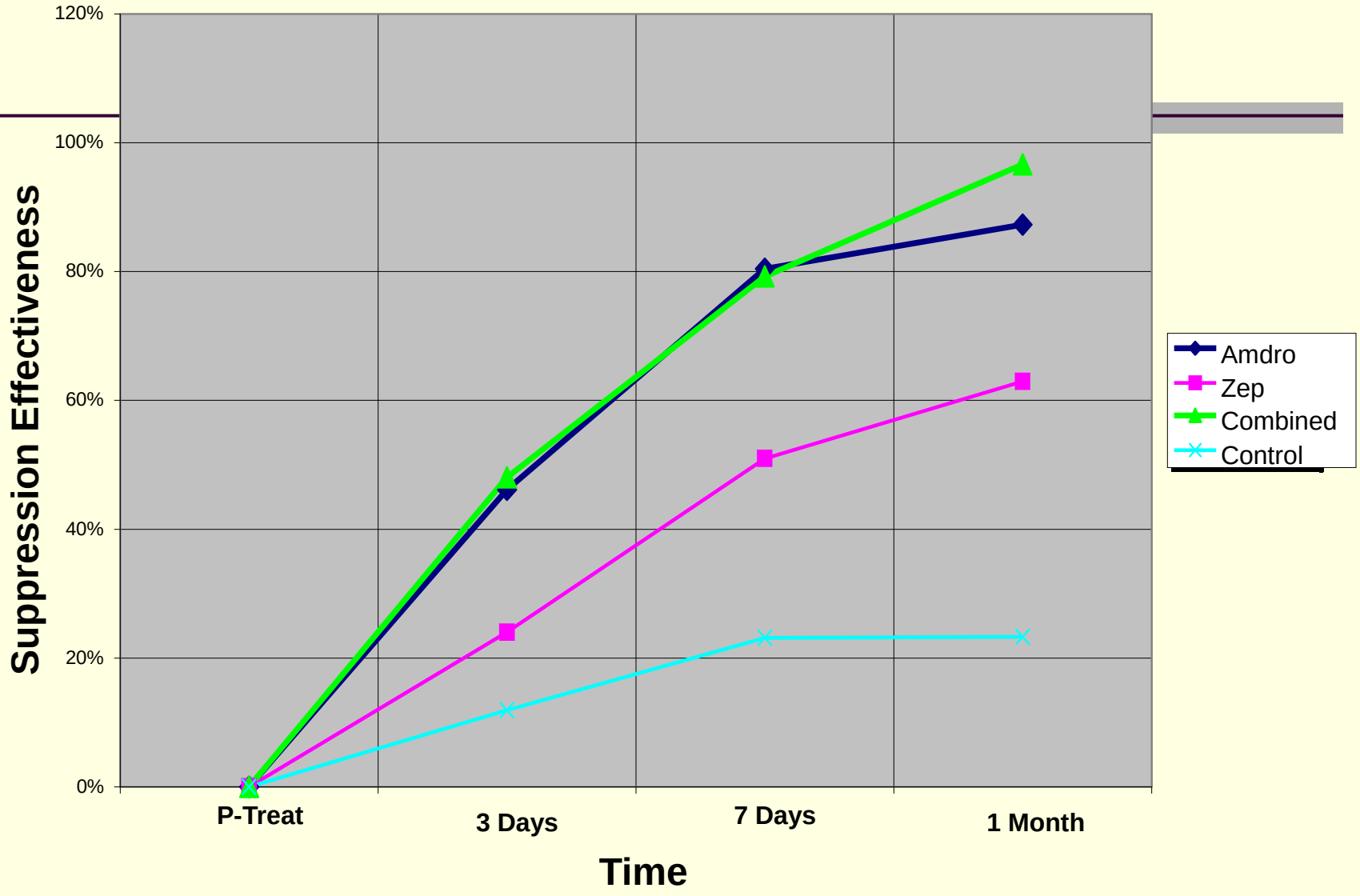
If < 20 ants surfacing
= Non-active

Statistical Analysis

Comparison between interaction of:
time and pesticide type

- Data entered in SPSS 16 for analysis
- LSD = 3.9
- Alpha (Type-I Error) = 0.05

Pesticide Effectiveness



Control Costs

- **No Tolerance Areas** = 148 acres

  Amdro - $1,704.96

  Zep - $497.28 Combined Cost - $2,202.24

- **Moderate Tolerance Areas** = 141 acres

  Amdro - $1,624.32

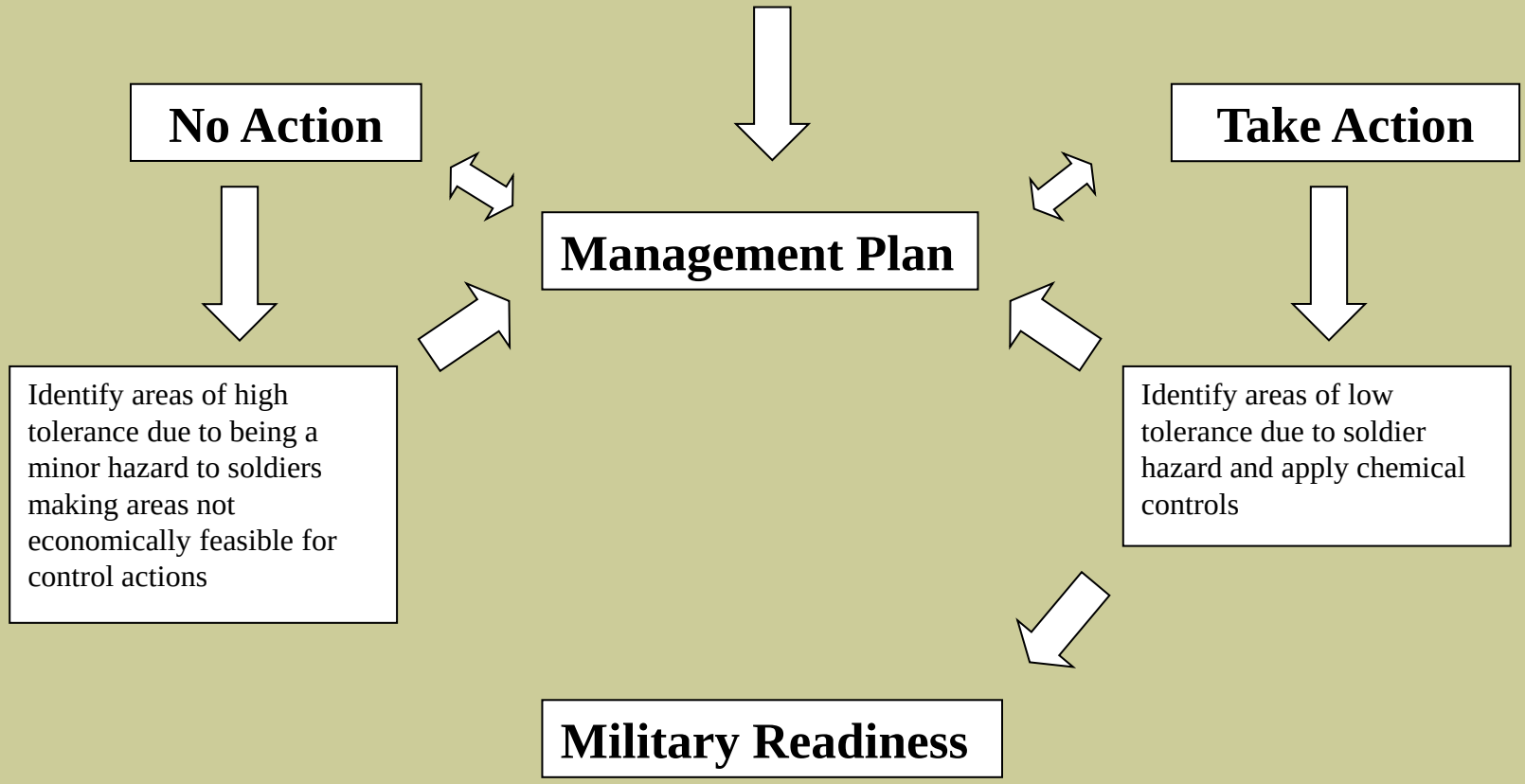
  Zep - $473.76 Combined Cost - $2,098.08

- **Minimal Tolerance Areas** = 30,000 acres

  Amdro $345,600.00

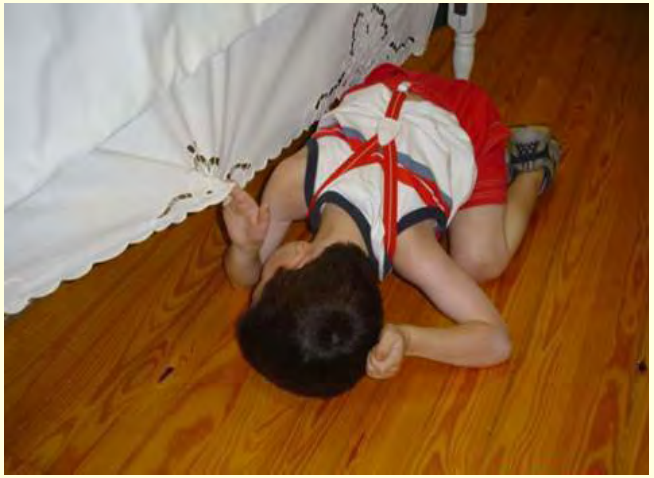
Assuming cost of Amdro at $11.52 per acre and Zep at $3.36 per acre.

Fire Ant Solutions



Integrated Pest Management

4- Steps for IPM



No Tolerance Level
Green
0 Mounds

↓

RED
>1 Mound

Moderate Level
0-<5 Mounds per
50ft. X 50ft. Area

↓

RED
>5 Mounds per
50ft. X 50ft. area

No Treatment or as needed Level

↓

GREEN
Training Areas (TA's)
And Bivouac Sites

Conclusions…fire ants can be managed.

The End

….**Questions**?