

CONTROLLING KUDZU USING LIGHT TO MEDIUM EQUIPMENT

IN PURSUIT OF GREEN

SE-EPPC

MAY 2009

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THE KUDZU COALITION

- Four years old
- No paid employees
- No grants
- Over 140 participating groups
- Mission is more than just “control”

OVER 65 SITES – ALL SUCCESSFUL



ALONG RAILROAD BANKS ...



SAVING NEIGHBORHOOD TREES ...



EARLY FOCUS

- During 2005 & 2006:
 - Tools
 - Methods for **individual** plant kills

VOLUNTEER VICTORIES & TROPHIES



2/24/2005

STUDENTS OUTDOORS



RECENT FOCUS

- Larger and larger sites
- But ... removing the bio-mass is a huge task
 - **30 to 40 %** of volunteer time



CHALLENGE # 1

- **Bio-mass**

- Overwhelming
- Typically waist high or higher
- Prevents access to the ground
- Hides what is under there



POSSIBLE SOLUTION

- “Maybe my skid-steer loader could speed the clearing of the kudzu mass.”

Volunteer Paul Blakeley
August 2006

SOLUTION # 1: SKID-STEER ON A ROLL (Some soil disturbance)



WHOLESALE BIO-MASS REMOVAL

“Weapon of Mass Destruction”



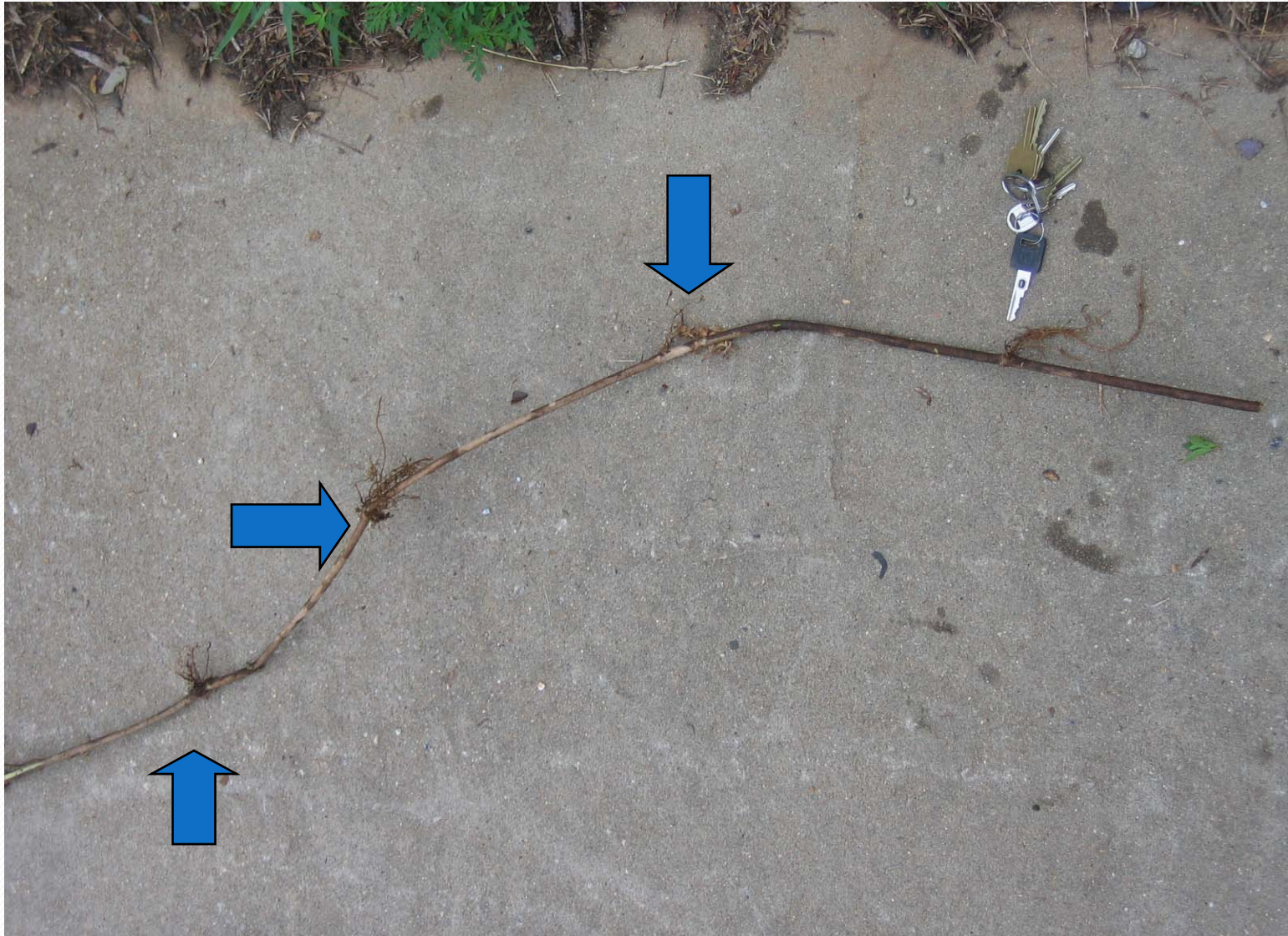
LITERATURE RESEARCH

- 15 university and state websites
- None mention use of skid-steers
- One mentions use of disking prior to herbicides
- One mentions use of brush hog prior to herbicides

CHALLENGE # 2

- **Many, many crowns**
- Huge number in every patch
- Needed a way to measure effectiveness of removal methods

NODES CAN ROOT EVERY FOOT OR SO



CROWN DENSITY: VISUALLY

(Each flag marks a kill)



SOLUTION # 2: DR. MILLER'S IDEA ($\frac{1}{4}$ milli-acre sampling research tool)



FINDINGS

... In mature, open patches:

Typically 150,000 crowns per acre

From: 40,000 crowns per acre

To: 365,000 crowns per acre



CHALLENGE # 3

**Mechanism for wholesale crown and
rooted node removal**

UNEXPECTED BENEFIT: CROWNS IN SKID-STEER PILES!



**LIFTING PULLS UP ABOUT 2/3 OF CROWNS
(Varies with moisture in soil, etc.)**



CHALLENGE # 4

- **Kudzu vines wrapped around the skid-steer's wheels and axles**

STOPPED TO CLEAR VINES



SOLUTION # 4: DOUBLED THE WIDTH

UNEXPECTED BENEFIT: DOUBLED SWATH



CHALLENGE # 5

- **Uneven terrain**
 - **Skid-steer was mostly limited to level ground**

SOLUTION # 5: METAL TRACKS

(Second hand at dealer's cost: \$1,000)



TYPICAL KUDZU SITE - BEFORE

(Daunting task for volunteers)



KUDZU: AS PORTRAYED BY A HIGH SCHOOL VOLUNTEER



AFTER SKID-STEER LOADER TREATMENT (Now workable by volunteers)



CHALLENGE # 6

- **Need expanded reach**
 - across creek
 - up into trees
 - down into creek bed or ravine

HARD TO SHOT PUT 65 POUNDS



SOLUTION # 6: LONG BOOM WITH NOSE FOR INSERTING GRAPPLE HOOK



HIGH ACROSS CREEK



GOTCHA!



INTRODUCING ... “KUDZILLA”



Wildland Weeds

FALL 2008



Printed
U.S. Postage
PAID
Gainesville, FL
Permit No. 726

CHALLENGE # 7

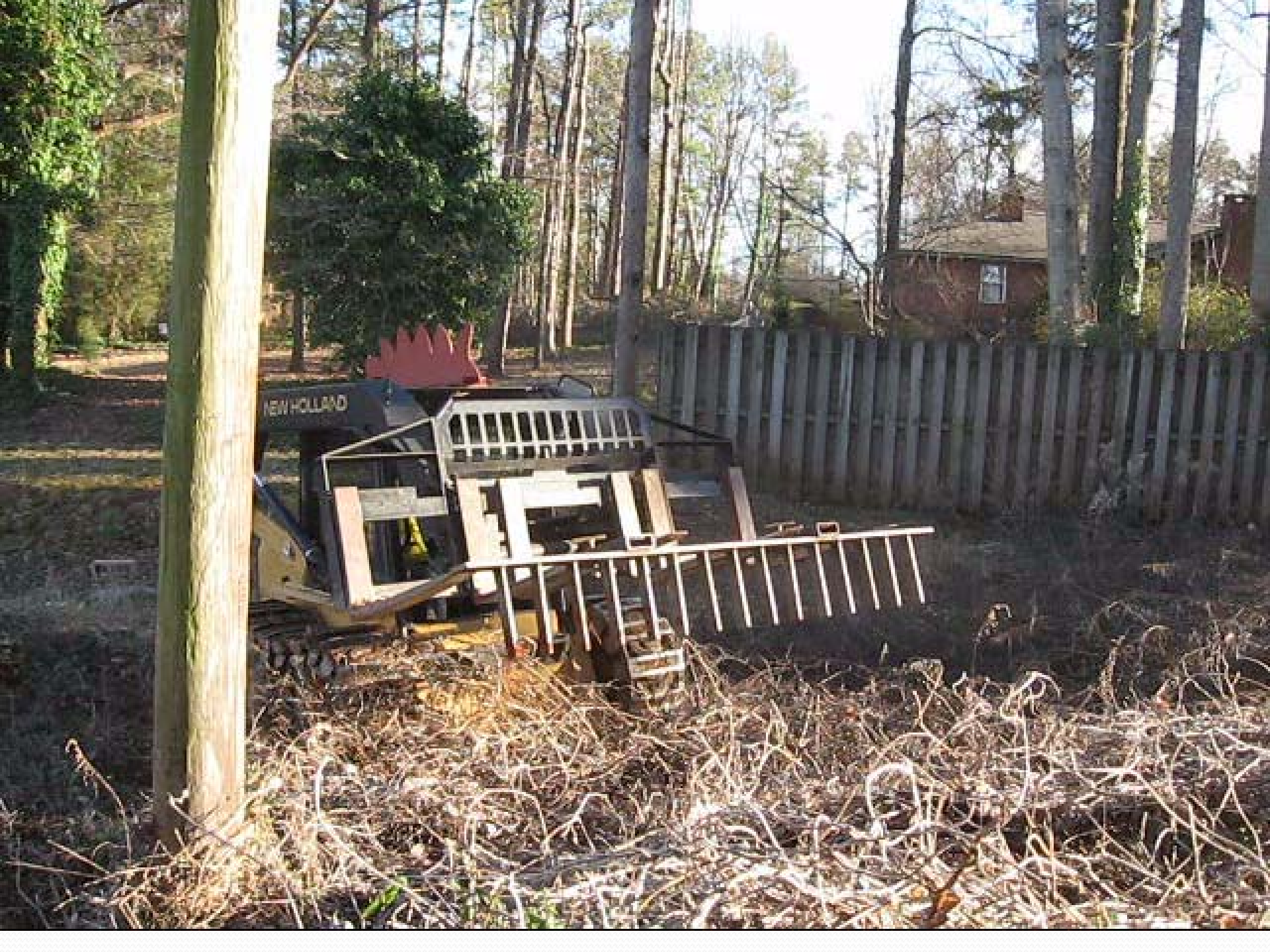
- **Need to “rake” kudzu from flat surfaces:**
 - Uphill banks
 - Creek beds

SOLUTION # 7: THE KUDZILLA “KLaw” (Some ground disturbance)



BOOM & TEETH: CAN BE MOVED LIKE A RAKE





YELLOW FOR BETTER VISIBILITY



CHALLENGE # 8:

FIND EFFECTIVE TRACTOR METHODS



BRUSH HOGS REMOVE BIO-MASS

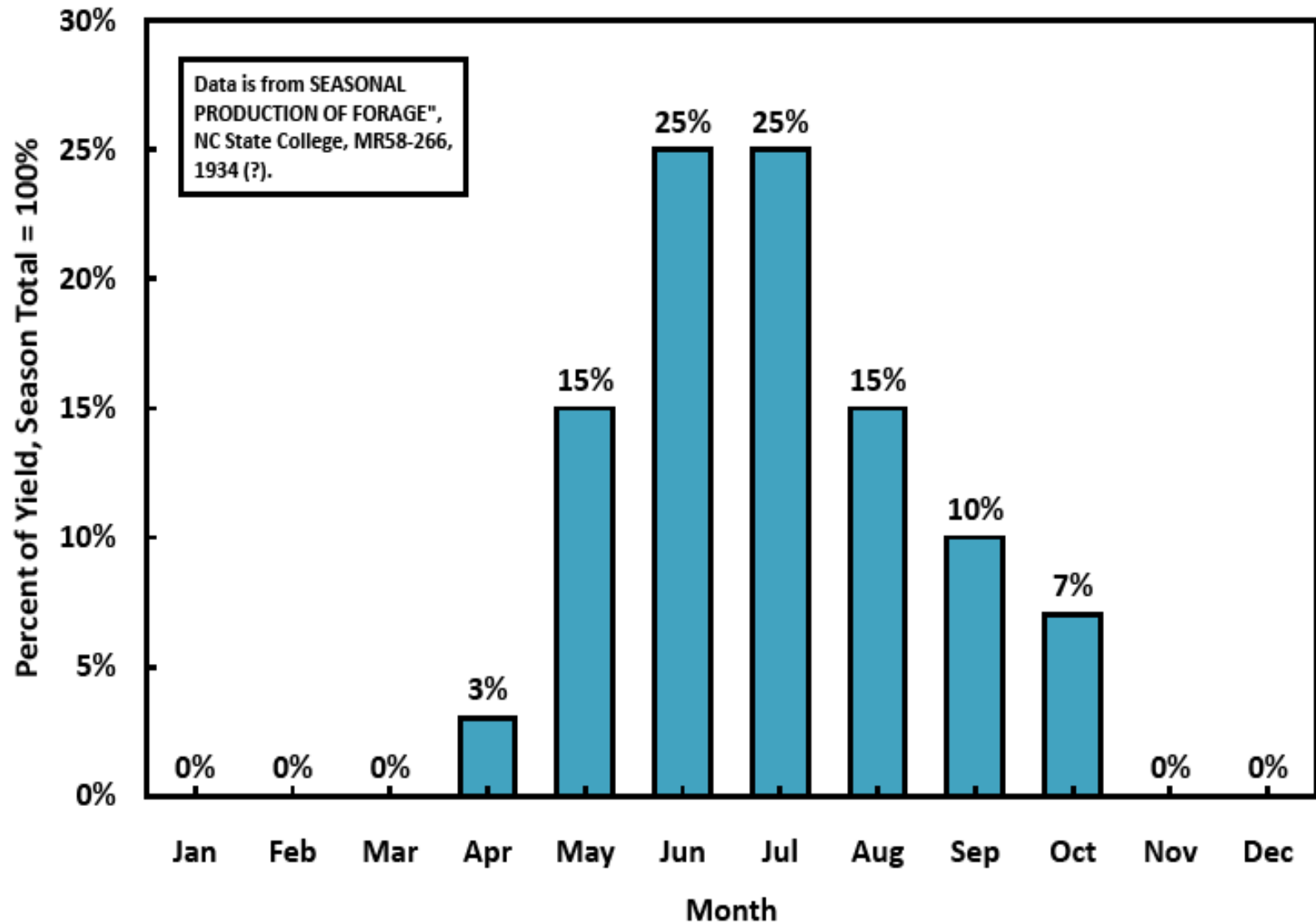


STRING TRIMMER

WEEKLY TREATMENT WORKS



SEASONAL PRODUCTION OF KUDZU FOR LIVESTOCK FORAGE



REPEATED BRUSH HOGGING

- First treatment removes existing bio-mass
- Follow-up:
 - Removes new vines
 - Interrupts first rooting of new growth (**late July**)
- Late season:
 - Removes & disturbs some crowns & hair roots
- Literature & Edwards confirm “Three times hurts”

APRIL RESULTS – EARLY BUT PROMISING



OFFSET FLAIL MOWER (Some soil disturbance)



AFTER OFFSET FLAIL MOWER



MOWING PERSISTENTLY CONTROLS IT



CHALLENGE # 9

(Area of embarrassment)



AFTER SKID-STEER: CULTIVATOR WITH 12" SWEEPS



LIMITED TO LEVEL, OPEN TERRAIN (Significant soil disturbance)



AFTER SWEEPS ... EXPOSED CROWNS & ROOTS



UNEXPECTED BENEFIT FROM MOTHER NATURE

- Dr. Gill Newberry suggested:
 - Winter kill might occur on exposed roots & crowns
- Study by Dr. Sage at University of Toronto :
 - Roots are more susceptible to cold than crowns or vines
 - Killed when tissue reaches **23 F**
- If the cold doesn't kill them, brush hogging again will

ROTO-TILLER ALSO EFFECTIVE (Significant soil disturbance)



SKID-STEER, THEN SWEEPS OR ROTO-TILLER KILLS OVER 90 % OF CROWNS



READY FOR VOLUNTEER MOP-UP

- But this is another story for another time.

FROM KUDZU TO COMMUNITY GARDENS IN NINE MONTHS



INVASIVES JUNGLE: PRIVET, ROSE, IVY, WISTERIA, HONEYSUCKLE, & KUDZU



... TODAY



PRICE OF ATTACHMENTS

● Rebuild forks (widening)	\$ 700
● Booms: Two 4', one 8', and one 16'	2,000
● Nose and drilled holes	250
● Rakes (Klaws) 4' and 8'	550
● Sub-total Machine Shop	\$3,500
● Used forks & carriage	400
● Second hand metal tracks	1,500
● Field cultivator with bolted sweeps	550
Grand total	\$5,950



VALUE OF VOLUNTEERS

PRICELESS

OVERALL COST

- With volunteers: **Not zero**
- Without volunteers:
 - Herbicide methods: **Less**

The difference is narrowing

OPERATIONAL ALTERNATIVES

- **First treatment methods:**
 - Skid-steer loader (Kudzilla)
 - Brush hog
 - Herbicides applied by certified professional
- **Second treatment methods:**
 - Skid-steer with sweeps
 - Tractor with sweeps or roto-tiller
 - Misc: Fence, sheeting, mowing, weed eater, etc.
 - Herbicides
- **Third treatment methods:**
 - Mop up (surgical)
 - Brush hog, mowing, weed eater

OBSERVATIONS

1. Each site is different.
2. No single method is best for all sites.
3. A combination of methods (integration) can be more effective than using a single method multiple times.

**More details on website
www.kokudzu.com**

QUESTIONS?