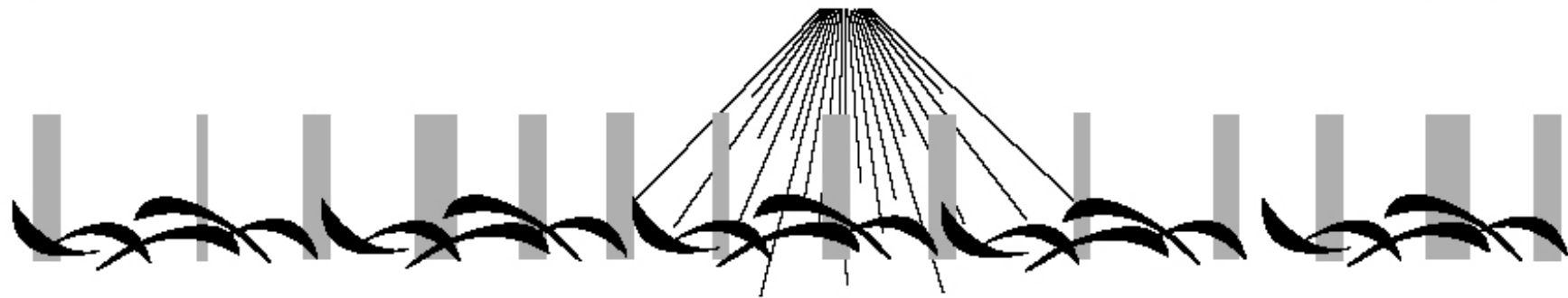


**B R O W N
B R U S H
M I O N I T O R**



Overview of the Brown Brush Monitor

Technical design aspects and
application advantages

Beau Miller - Dow AgroSciences

530-304-6921

The Brown Brush Monitor - Historical Background

- The Brown Brush Monitor design aspects are based upon the concept of **mowing brush and applying herbicide simultaneously.**

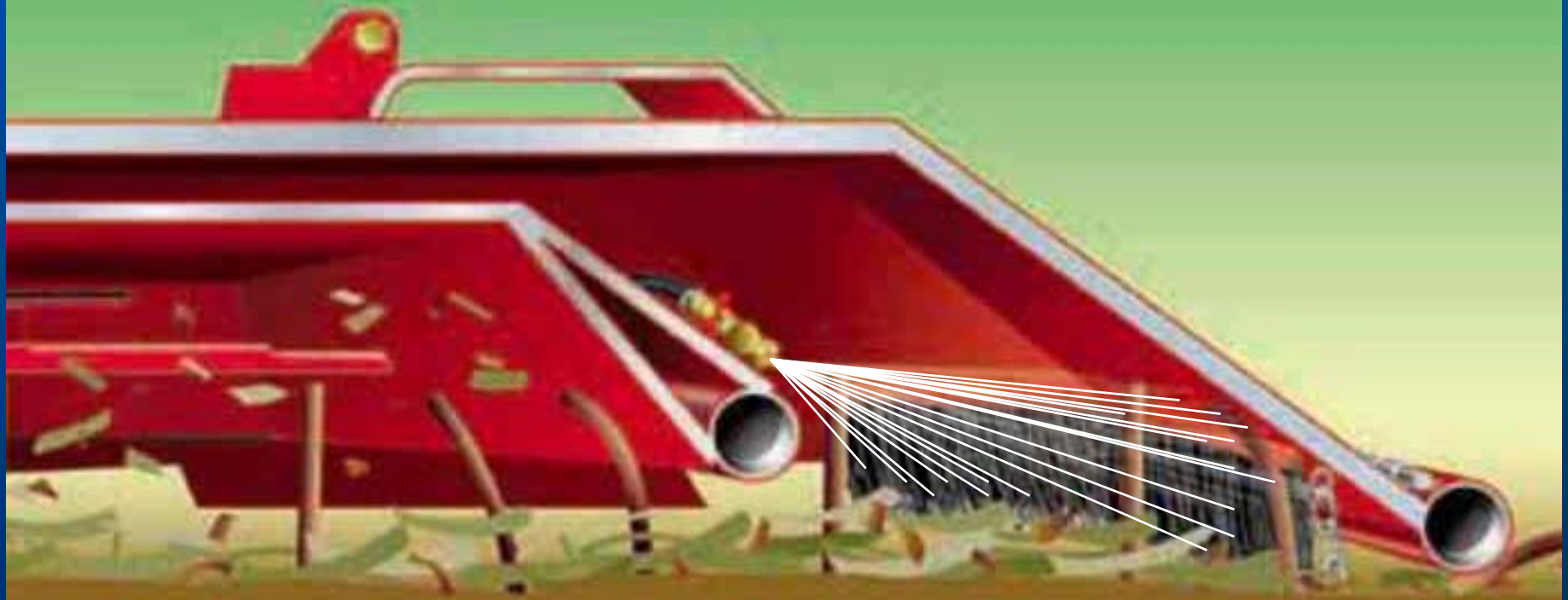
How does the Brown Brush Monitor Work?

- **The task of mowing and applying herbicides is separated into two specialized chambers**
 - In the first chamber (the mower deck), the brush encounters a set of 6-inch blades that are capable of cutting stems two to three inches in diameter. The mowed debris is removed from the mower deck through a side discharge door
 - Behind the mower deck are enclosed herbicide chambers where the cut stubble encounters two treatment phases - a row of nozzles spray herbicides directly onto the stubble; then, the system catches any unabsorbed herbicides in a “reservoir” made up of a series of scrapers, brushes and chains, which wipe product onto the stubble in the second application stage

Current Setup



4 inch mowing height



Caltrans vs. Yellow starthistle with Transline













4/26/2000 9:04am



Orange County Quail Hunting at
Huntington Beach with Garlon 3A





Side biomass discharge area that keeps from wasting herbicide on debris that's already been cut

4/26/2000 8:57am

Thistles choke Inland forest species

ENVIRONMENT: Naturalists are waging a battle to kill the wild plants, which are spreading quickly.

BY SANDY STOKES
THE PRESS-ENTERPRISE

Shears, shovels, machetes, poison and fire don't stop it. The wild artichoke is so tough even go-phers don't slow it down.

Cynara cardunculus, aka artichoke thistle, has invaded the San Mateo Wilderness area of the Cleveland National Forest.

Three or four years ago the thorny weed was spotted on private land in the area but, "we didn't see any on the forest," said Mary Thomas, biologist for the Trabuco district of the Cleveland forest.

Then, "all of a sudden I got a call from people out hiking who passed a bunch of this stuff," she said. Last year there were two to three acres infested. Now the thistles have spread over about five acres, she said.



PAUL ALVAREZ / SPECIAL TO THE PRESS-ENTERPRISE

Ed Pearson of the San Bernardino County Department of Agriculture, Weights and Measures fights to keep artichoke thistle from spreading in the Chino Hills. The thorny weed has encroached into the San Mateo Wilderness area of the Cleveland National Forest.

Thomas is seeking volunteers willing to brave the wicked thorns to help dig up the plants. Meanwhile, she's doing the necessary environmental assessment to allow weed killer to be used on the forest thistle in the future.

"This is one nasty weed," says

Ed Pearson, with the San Bernardino County Department of Agriculture, Weights and Measures. He's been battling artichoke thistle in the Chino Hills for 18 years.

In the old days, "we used to wait 'til the flower heads were up and

cut the flower heads off and then try to dig the plant out," he said. The plant is covered with spines, can grow to six feet tall and has a tap root that extends far into the ground.

In recent years, weed killer applied just before the plants bloom has made his thistle fight easier, he said.

Edible cousin

Not everyone loathes *Cynara cardunculus*. The plant is lovingly called "cardo" by connoisseurs of Mediterranean cuisine. The flower of the plant is smaller than artichokes and considered inedible.

But Italian cooks gather the artichoke thistle's leaf stalks, carefully peel away the spines then slice and boil fleshy stalks. The cooked vegetable, with a flavor reminiscent of artichoke and celery, can be breaded and fried or added to recipes.

Artichoke thistle is closely related to the plant that produces

PLEASE SEE THISTLES, B3

Welcome to the Jungle of Rodeo and Glypro Plus







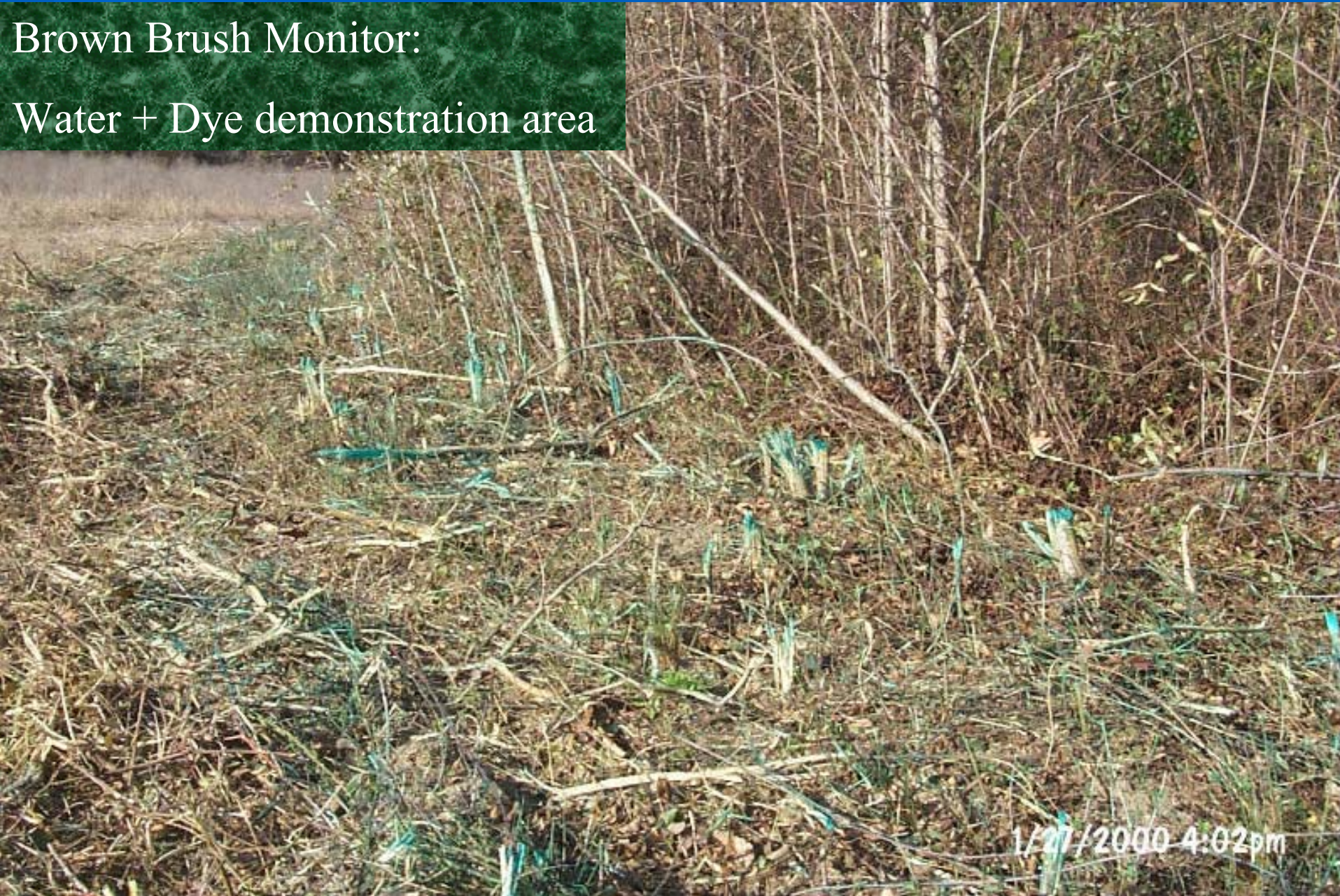






Brown Brush Monitor:

Water + Dye demonstration area



1/27/2000 4:02pm



Transmission line results:
Brown Brush Monitor -
one year after mowing -
Garlon 4 @ 5qts + Arsenal
@ 16 fl ozs

Key advantages of the the Brown Brush Monitor

- **The Brown Brush Monitor is the first practical chemical mowing design to treat the cut stubble ends, rather than just broadcasting the herbicide under the mower deck.**
- **Targeting herbicide application placement raises the percent of product effectively applied to stubble and minimizes the potential for herbicide application to the ground.**
- **The simple system regulates the herbicide application rate by tractor speed, much like tractors in row crop applications.**
- **A relatively simple system – void of complicated wiring, sensors or computer parts makes it easy and relatively inexpensive to maintain.**

Economics

- **Savannah Electric has done an economical evaluation which showed a 19% savings utilizing the Brown Brush Monitor**
 - **All inclusive evaluating mowing cost, follow up treatment with backpacks, complaint handling and then re-treatment if necessary vs. the one time pass with the Brown Brush Monitor**

Conclusions

- **Suburban sprawl is increasing the number of “sensitive” acres each year**
- **A “Low Profile” herbicide application is becoming more attractive for our “Sensitive” acres**
- **Greatly reduces the potential for physical drift**
- **Extremely important for a mow and spray operation to keep the material on the targeted stems to be effective**



Garlon 4 @ 3 quarts/A 1 YAT

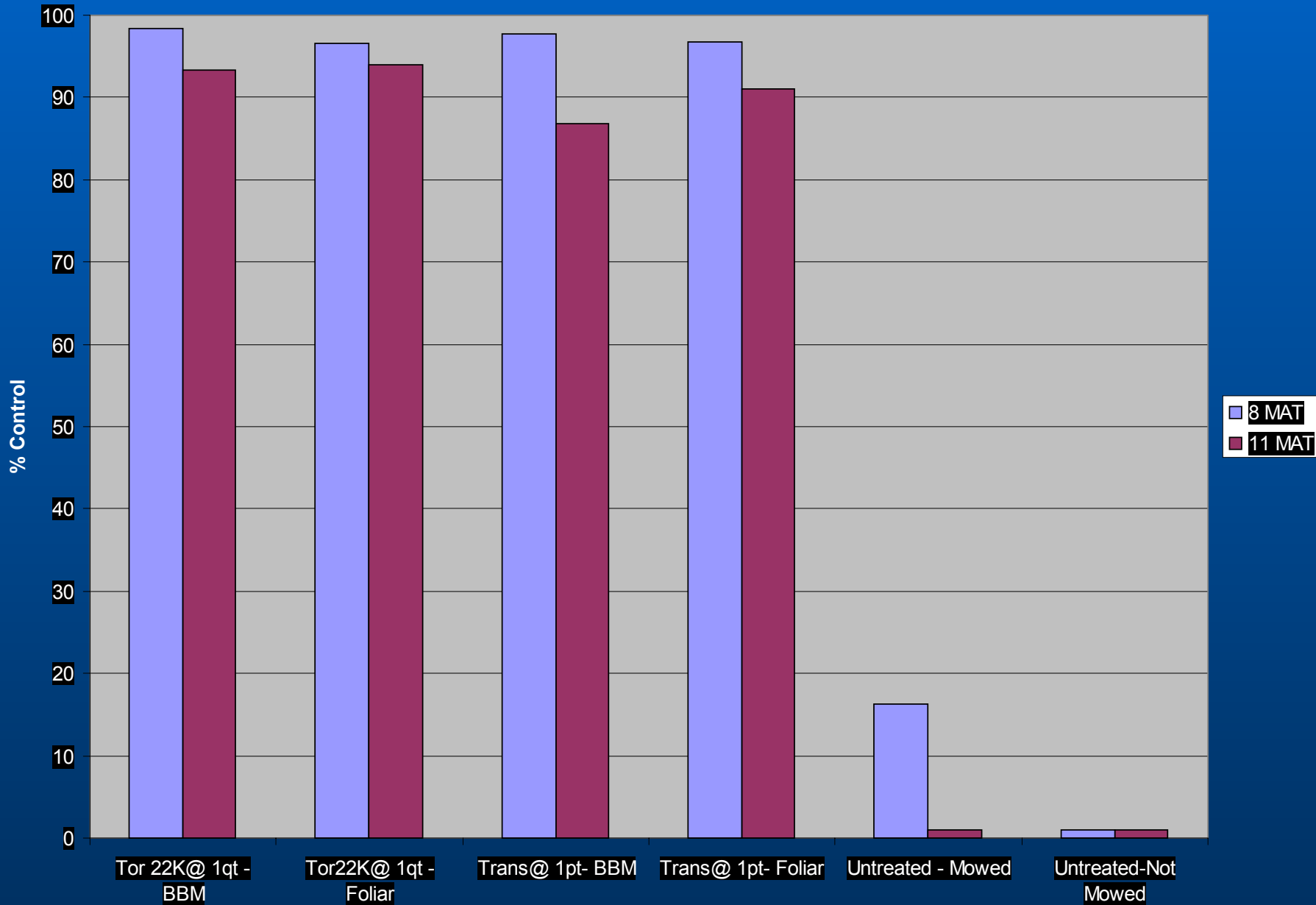


Mowed/untreated area (foreground) Garlon 3A
@ 4.5 quarts/A (background) 1 YAT



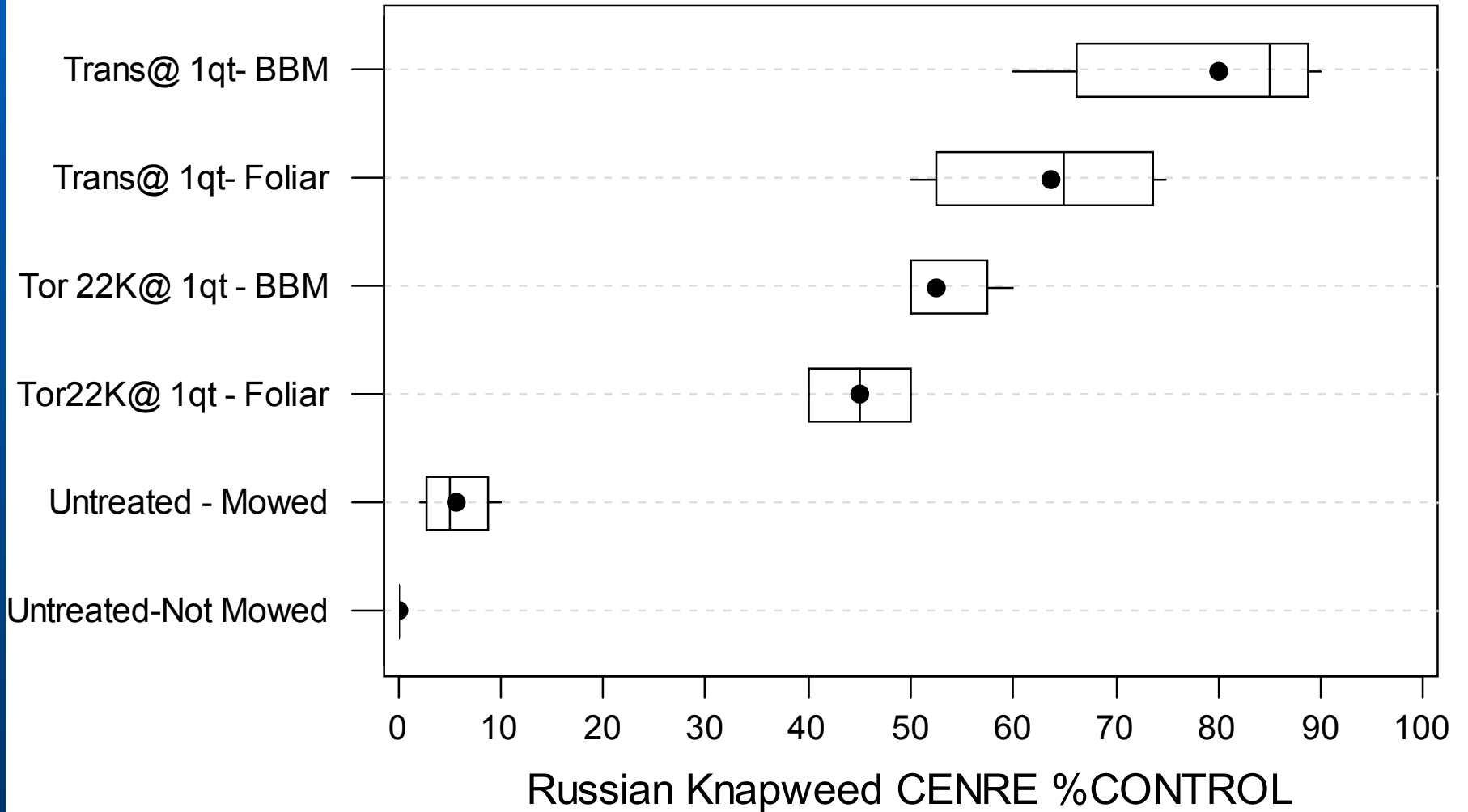
Brown Brush Monitor: VFC - Russian Knapweed - CENRE - Applied Sept 2001

Coop Trial with Oregon State Univ



Brown Brush Monitor

VFC0227 - Russian Knapweed - 1 YAT Results



Black solid dot = Mean value

Untreated Russian knapweed



Russian knapweed

Baker City, Oregon

Fall application of Transline
@ 1 pt/A through the
Brown Brush Monitor

Treated area, Note good grass response

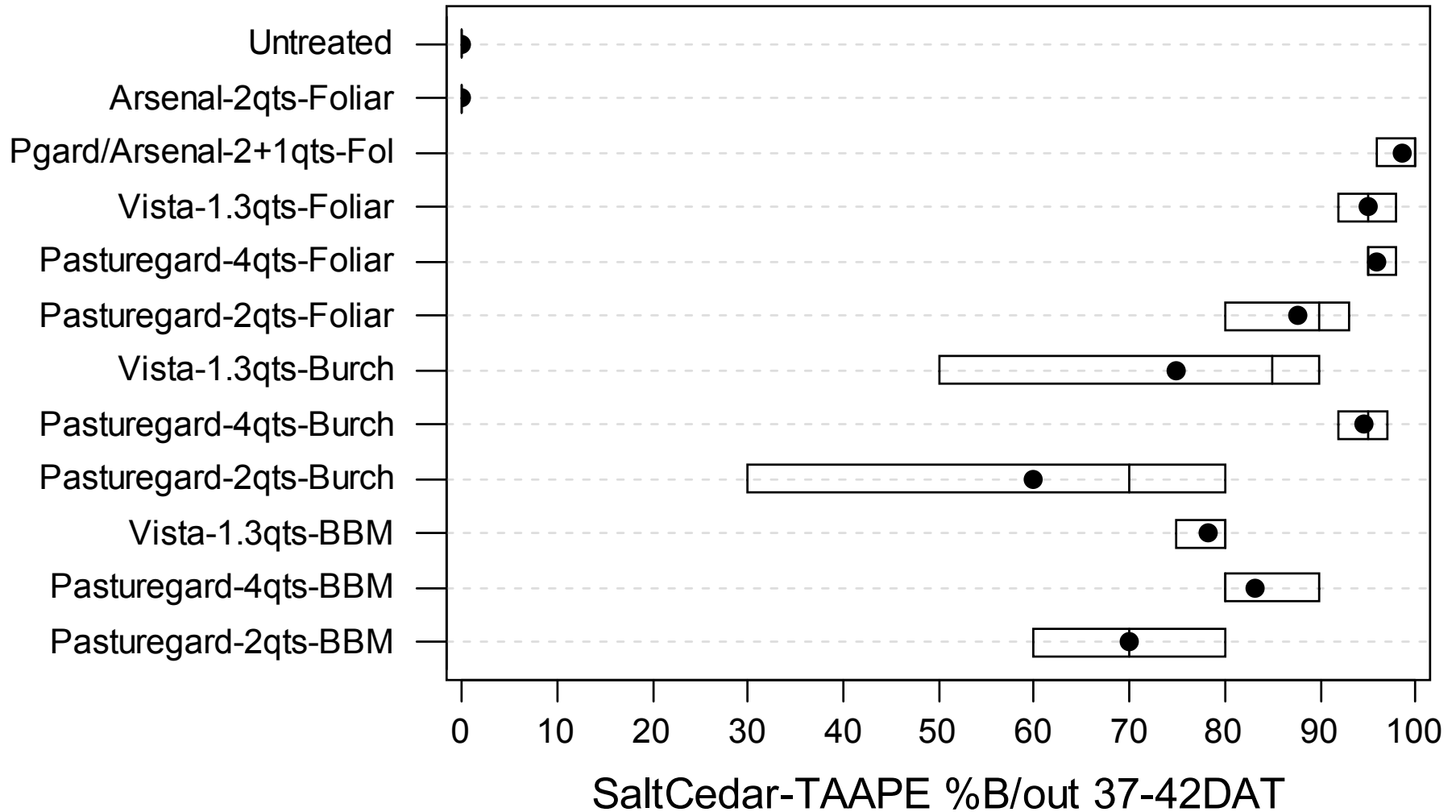


Treated area had heavy seed
populations



Brown Brush Monitor

VFC0222/23 - Salt Cedar - Brownout



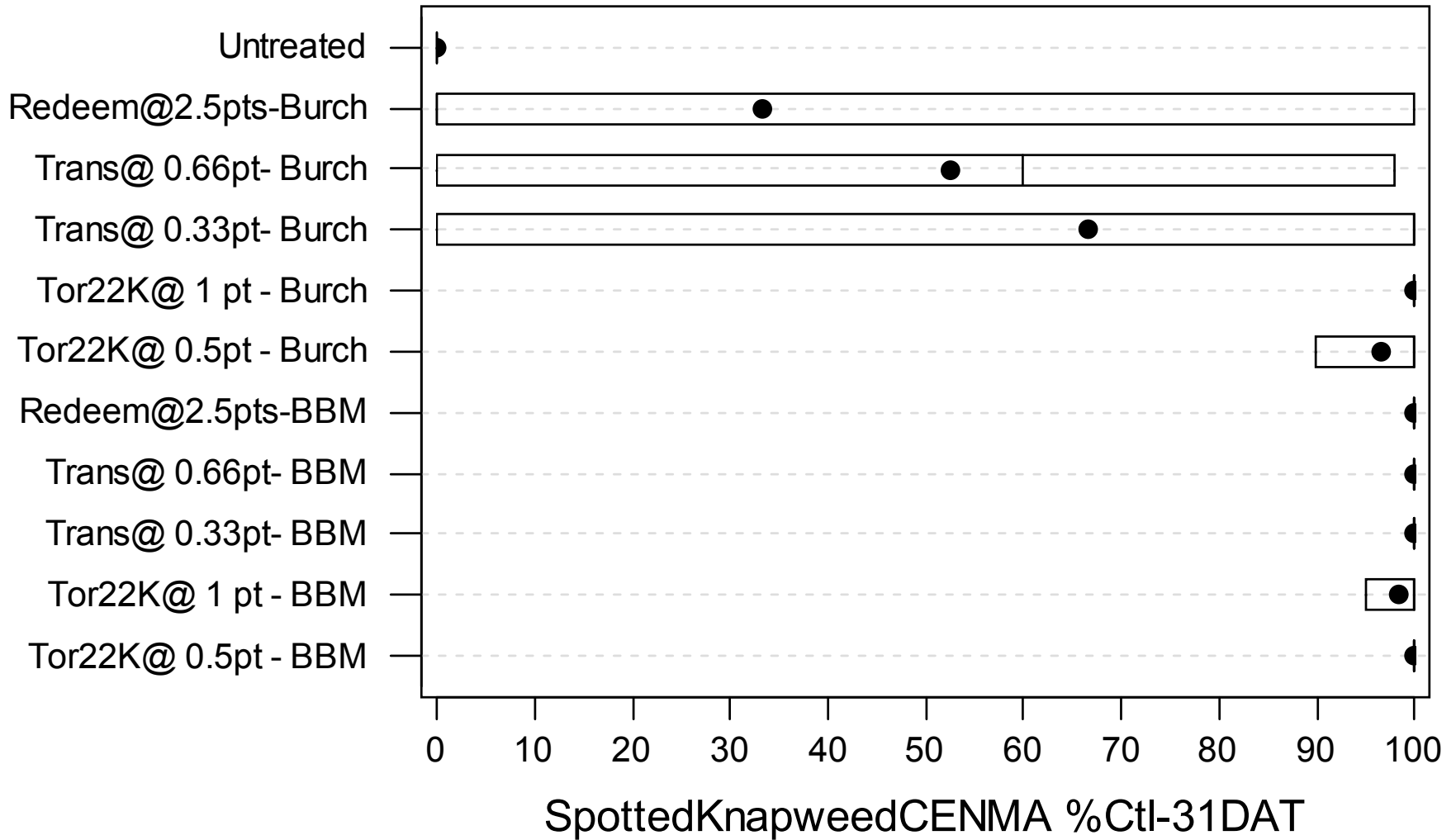
Black solid dot = Mean value

Salt cedar Trial - BBM on rear of tractor Burch Wet Blade on front



Brown Brush Monitor

VFC024 - Spotted Knapweed Control



Black solid dot = Mean value

The Future Looks Bright



- Integrate the returnable refillable container concept with the Brown Brush Monitor.
 - In 2003 mowers will have the containers instead of tanks.
 - They will be able to either fill the tanks on the mower or simply switch them out
 - Tanks will be protected with a steel cover that will open for easy transfer of tanks

Future Setup





Brown Turf Monitor -
Will be designed to handle
grass and small brush.....
But not larger brush suited
for the Brown Brush Monitor

Brown Turf Monitor -
Concept is for Roadside,
Pipeline, Airport, etc -
Rights-of-Way mowing



Roadside applications with the Brown Turf Monitor may be a larger opportunity for DAS than the BBM



Who To Contact

- **Equipment**

- **Brown Manufacturing**

- **Jeff Thagard or Ron Brown**
@ 1-800-633-8909

- **Herbicides**

- **Beau Miller**

- 530-304-6921**