



# Avenger® Weed Killer

*Just The Facts*

March 22, 2016



RECEIVED AT IEM MEETING ON 3/22/16  
Stephanie Neimiller

# Avenger Weed Killer Overview

Avenger Weed Killer is a non-selective, post-emergence (after growth) herbicide that quickly and effectively kills weeds, grasses and broadleaves without causing harm to the environment.



The active ingredient, d-Limonene (citrus oil), naturally strips away the waxy plant cuticle, causing the plant to dehydrate and die.

University and independent testing results prove that Avenger Weed Killer is as effective, but faster acting when compared against leading synthetic herbicides such as those containing glyphosate. Avenger also works quickly to dissipate and is highly biodegradable as to not effect soil and ground water.

When tested against non-organic “natural” herbicides containing vinegar (acetic acid), citric acid, clove oil or fatty acids (soap), Avenger Weed Killer is more effective with quicker results.

Avenger Weed Killer is a patented product which has been approved for use in organic gardening by the USDA’s National Organic Program (NOP) Rule. Avenger Weed Killer has also been listed by the Organic Materials Review Institute (OMRI) for organic use.

## What is d-Limonene, the Active Ingredient in Avenger?

The active ingredient in Avenger Weed Killer is an emulsified d-Limonene (citrus oil), which acts as a natural degreaser. d-Limonene is a thin clear liquid with a beautiful dry citrus scent.

d-Limonene is found in more than 300 fruits, vegetables, herbs and spices, and is the major component of the oil extracted from citrus rinds as well.



When citrus is squeezed for juice, a layer of oil remains on top of the juice, this oil is d-Limonene (citrus oil). After the juicing process is completed, the citrus peels are conveyed to a steam extractor which extracts more of the oil from peel. When the steam is condensed, a layer of oil floats on the surface of the condensed water, creating technical grade d-Limonene.

Today, D-limonene is widely used in commercial and industrial cleaners because of its effectiveness. Furthermore, it is much safer and friendly to the environment. D-limonene is also commonly used at full strength as a biodegradable and natural solvent. d-Limonene is an excellent degreasing agent and is commonly used in soaps, food, lotions, mouthwash and perfumes. It is also used in natural soaps for pets for flea and tick control.

The use of d-limonene in its natural state has contributed to making Avenger a safe, highly biodegradable, non-selective, post-emergent herbicide with no negative side effects to the earth's soil, water supply, animals or people.

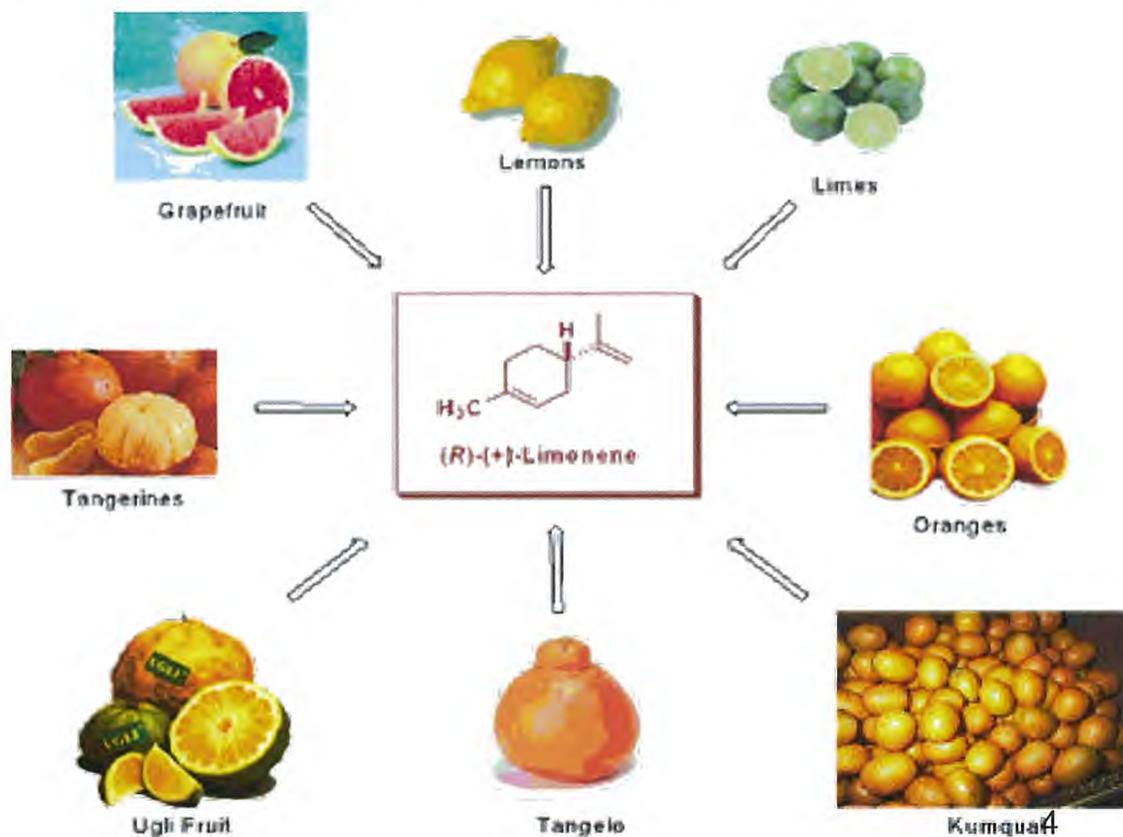
## What is d-Limonene, the Active Ingredient in Avenger? (cont'd)

Previous research found that due to its volatility, d-limonene was a relatively weak herbicide. Cutting Edge Formulations spent considerable efforts in developing enhanced proprietary emulsions to substantially reduce the volatility of d-Limonene. These improved emulsions ensure Avenger remains on the plant leaf surface longer, making it more effective.

Avenger's patented Ready to Use (RTU) formula is made up of water and 17.5% d-Limonene. The remaining ingredients are proprietary non-toxic and safe surfactants to help dissolve the d-Limonene (Citrus Oil) in water.

Avenger's concentrate formula contains 70% d-Limonene, but then is diluted with water at 1 part

Avenger Weed Killer to 6 parts water.  
Harder to control weeds are diluted at 1 part Avenger Weed Killer to 3 parts water.



## Is d-Limonene Safe?

Growing concern for our environment is what prompted Cutting Edge Formulations to research and formulate an herbicide which is non-toxic and safe to use around people, pets, wildlife and the environment. The active ingredient, d-limonene is a naturally occurring oil which has excellent degreasing properties, which have proven to work effectively on eliminating weeds and undesirable vegetation.

The U.S. Food and Drug Administration (FDA) classifies d-Limonene as ***Generally Recognized as Safe*** (GRAS) - **essentially no measurable toxicity** for certain uses.

The Environmental Protection Agency (EPA) states, ***“d-Limonene is practically non-toxic to birds, fish and mammals and is highly biodegradable”***.

Avenger Weed Killer has also passed strict scrutiny by the Organic Materials Review Institute (OMRI) and has achieved OMRI Listed status. OMRI provides organic certifiers, growers, manufacturers and suppliers a strict independent review of products intended for use in certified organic production, handling and processing.

Avenger Weed Killer passed EPA approval under the label language indicating that ALL ingredients (active and inert) in a pesticide product and all uses, meet the criteria by the U.S. Department of Agriculture (USDA) National Organic Program (NOP) Rule.

## Is d-Limonene Safe? *(cont'd)*

Avenger Weed Killer is Approved for Use in Organic Gardening by the NOP. “FOR ORGANIC GARDENING” is intended to be used where the product is typically for residential use and does not require worker protection language.

Avenger Weed Killer only carries a CAUTION warning, which is the lowest verbiage allowed on pesticide labeling. d-Limonene can cause slight eye irritation similar to if you were squeezing a lemon and some of the juice squirted in your eye.

There also may be slight skin irritation for those sensitive to citrus oils or juices. It may be irritating when inhaled due to sensitivities or allergies.

We’ve had the question asked, “ If Avenger Weed Killer is an organic product, why does the label say ‘Harmful if absorbed through skin’ and ‘Flush skin for 15 to 20 minutes’, is it safe to use?”

d-Limonene is a effective degreasing agent. While it is organic and safe for the environment, it is also powerful and care should be taken when handling any strong substance.

One of the nicest features of using d-Limonene in Avenger Weed Killer is the pleasant citrus aroma that is left behind when sprayed.

**But don't just take our word, here's what the EPA says...**

## **Exposure and Risk Assessment on Lower Risk Pesticide Chemicals**

### **D-Limonene**

Prepared by

Special Review and Reregistration Division Office of Pesticide Programs  
U.S. Environmental Protection Agency 1801 South Bell Street Arlington, VA 22202

### ***Risk Characterization***

d-Limonene is expected to rapidly volatilize from dry soil, wet soil and water, therefore exposure through the drinking water routes is considered very unlikely. Exposure through the dietary route as a result of application of a pesticide product is considered to be also unlikely due to the volatile nature of d-limonene.

### ***VIII. Drinking Water Considerations***

d-Limonene is only somewhat soluble in water (13.8 mg/L) and has an estimated octanol/water partition coefficient of 4.2. d-Limonene is expected to rapidly volatilize from water to the atmosphere, with an estimated half-life for volatilization from a model river of 3.4 hr, although adsorption to sediment and suspended organic matter may attenuate the rate of this process. Based on these data, it is unlikely that d-limonene will occur in drinking water sources resulting from any of the registered and proposed uses as an active ingredient or when used as an inert ingredient as discussed above.

**But don't just take our word, here's what the EPA says...** *(cont'd)*

## ***XI. Environmental Fate/Ecotoxicity***

d-Limonene is only somewhat soluble in water (13.8 mg/L), and it is somewhat resistant to aerobic and anaerobic biodegradation in water and soil. Based on its water solubility and estimated octanol/water partition coefficient (4.2), its predicted soil adsorption coefficient indicates that it will display low mobility in soil. However, it is expected to rapidly volatilize from both dry and moist soil to the atmosphere, although adsorption to soil may attenuate the rate of this process.

Once in the atmosphere, d-limonene is expected to rapidly undergo gas-phase oxidation reactions with photochemically produced hydroxyl radicals, ozone, and at night with nitrate radicals, with calculated half-lives for these processes on the order of a two hours or less.

Toxicity studies have been performed with both the technical form of d-limonene and its formulated products, as well as products which contain d-limonene as an inert ingredient. Based on the data from these studies, d-limonene has been shown to be practically nontoxic to birds and slightly toxic to freshwater species, both fish and invertebrates. Studies on rats have also shown d-limonene to be practically non-toxic to mammals (EPA, 1994).

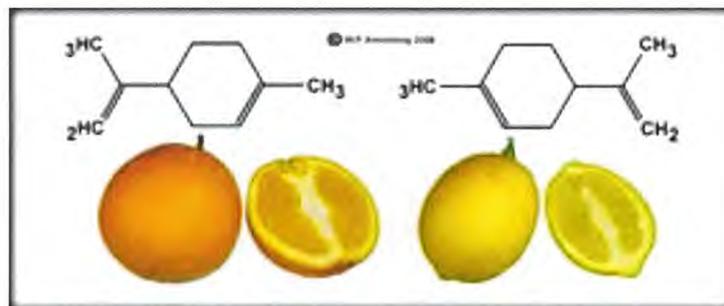
# What Other Ingredients are in Avenger Weed Killer?

Avenger's patented Ready to Use (RTU) formula is made up of water and d-Limonene. The remaining ingredients are proprietary non-toxic and safe surfactants to help dissolve the d-Limonene (Citrus Oil) in water.

Avenger **DOES NOT** contain the following ingredients:

- Glyphosate
- Corn gluten
- Acetic Acid/Clove Oil Combination
- "Food Grade" 200 Grain Vinegar or 20% Acetic Acid
- Fatty Acid
- Salt
- Any synthetic chemicals

Also, no Avenger products contain genetically modified (GMO) ingredients. In fact, to be considered for National Organic Program approval (EPA+USDA) and as a Organic Materials Review Institute (OMRI) listed product, products CAN NOT contain any (GMO) ingredients.



## How Does Avenger Work?

Avenger Weed Killer works by stripping away the waxy plant cuticle of the weed, grass or broadleaf, thus causing it to dehydrate and die.



Avenger works in conditions down to 40° F and in overcast conditions. This gives users the opportunity to get an earlier start on weed control, as weeds are generally smaller, more susceptible and less likely to recover. However, faster results are often achieved in sunny, hot and humid weather conditions. Also, for non-agricultural situations (homeowner, landscapers, municipalities, etc.) there is no re-entry time. Although it is recommended to allow for complete dry time as to keep from unintentionally spreading to plants and grasses which you don't want harmed.

Another bonus with Avenger is that sprayed areas can be planted within 2-3 hours after application or after it dries. Through a half-life process, Avenger Weed Killer dissipates and turns into CO<sub>2</sub> after it has dried. This also prevents for seepage into the ground.

Avenger controls most weeds, grasses and broadleaves including: Spurge, Sowthistle, Redroot Pigweed, Tumbling Pigweed, Annual Bluegrass, Shepherd's Purse, Common Purselane, Common Chickweed, Clover, Hairy Fleabane, Crabgrass, Smooth Crabgrass, Dandelion, Whitestem Filaree, Bermuda Grass, Bindweed, Shepherds Purse, Prickly Lettuce, Lambsquarters and Little Mallow.

# The Economics of Avenger Weed Killer

Formulated entirely from natural ingredients, Avenger Weed Killer, like other natural and organic products on the market, costs a bit more to produce. However, with our extensive research, we have developed a formula which is highly effective even when highly diluted. In essence, with Avenger Weed Killer, customers get more for their money.

Other natural weed killers on the market dilute their concentrates down 3:1.

Compared to these other alternatives, Avenger concentrate dilutes down 7:1.

On a usage basis, this makes Avenger more economical than other weed killers.



## Why Offer Avenger Organics Products?

More and more people, cities, states and businesses are recognizing the dangers in using synthetic chemical products in and around homes, schools, businesses, roads, parks, yards and gardens.

Parents want assurance that when their children are at school or on the playing field, they are safe. Not only in a security minded way, but also with what chemicals they may come in contact.

Avenger Weed Killer provides peace of mind to parents concerned about harmful herbicides.

Avenger's organic formulation allows it to dissipate quickly into the atmosphere, so parents can rest easy when children are playing and rolling on the ground. No residue will be carried home on the bottom of shoes or on clothes.

Pets benefit as well from natural products. No chance of cancer causing agents being ingested or absorbed through their feet or noses.

# Why Offer Avenger Organics Products?

## LAWN CHEMICALS INCREASE CANCER RISK IN DOGS

Exposure to herbicide-treated lawns and gardens increases the risk of bladder cancer by four to seven times in Scottish Terriers, according to a study by Purdue University veterinary researchers published in the April 15, 2004 issue of the *Journal of the American Veterinary Medicine Association* (J Am Vet Med Assoc 2004; 24:1290-1297). The study adds to earlier research conducted by the National Institutes of Health that found elevated rates of canine lymphoma in dogs exposed to lawn pesticides (1991). [See *Beyond Pesticides factsheet*] Meanwhile the American Veterinary Medical Association issued a release, "Herbicide Exposure May Increase Cancer Risk in Dogs," with the study authors' recommendations that owners of Scottish Terriers "should decrease their dogs' exposure to lawns or gardens treated with common herbicides, particularly phenoxy herbicides and possibly nonphenoxy herbicides" and "veterinarians should perform routine (every six months) cytologic urine exams in Scottish Terriers and other 'genetically high risk' breeds over six years old."

As these warnings about lawn pesticides are hitting the news wires, EPA and the chemical industry, hoping for support from the environmental community, are planning to issue guidelines and/or tips that urge people to "use pesticides safely" or "read the pesticide label." The group putting the documents together has refused to (i) disclose the Purdue study and other studies alerting the public to the link between lawn pesticides and adverse health and environmental effects, and (ii) support the public's right-to-know when pesticides are going to be used through neighborhood notification, so that people can take precautionary action by vacating the area and staying off treated lawns and landscapes. Local environmental and public health advocates have been successful in recent years in moving schools, parks, and town and city governments to adopt alternative practices that do not use toxic lawn pesticides. (See *Daily News*, February 19, 2004) [Join the Pesticide-Free Zone Campaign and national network]

The screenshot shows a WebMD article titled "Common Weed Killers Affect Developing Fetus" under the "health & pregnancy" section. The article discusses the risks of herbicide exposure during pregnancy. Key points include:
 

- Herbicide manufacturers are required to conduct health studies of the effects of these herbicides on reproduction. The safest exposures and safety hazards are provided on product labels. However, this very early time period in fetal development has not been investigated, she tells WebMD.
- Studies have detected these pesticides in human breast milk, fluid from women, human embryos, fluid, and even in fluid that surrounds the human newborn, she notes.
- In a previous two-year study, Greenlee investigated effects of pesticides and fungicides in women who mix and apply these chemicals. She found that women doing this kind of work were 27 times more likely to have fertility problems compared with pregnant women who didn't work with these chemicals.

 The article also includes a "Share This" section with options for Facebook, Twitter, and Email. A sidebar on the left lists various pregnancy-related topics like "Pregnancy Signs," "Pregnancy Nutrition," and "Pregnancy Exercises."

Home / Blogs / Science & the Public / [Blog entry](#)

## Pancreatic cancer linked to herbicides

Some weed killers may need to be treated with more respect.

By [Janet Raloff](#)

Web edition : Thursday, May 28th, 2009

[A+ A\\* Text Size](#)

A new study links two weed killers with [pancreatic cancer](#) in pesticide applicators and their spouses. The authors, most of whom work for the [National Cancer Institute](#), note that they are the first to link this particular malignancy with the farm chemicals — [pendimethalin](#) and [EPTC](#) — and really don't know how either would trigger cancer (although they do have a theory). But for now they are recommending that "these findings should be considered hypothesis generating and in need of confirmation."

## Herbicides and Pets

By [S.S. Lanning, DVM, MS, DACVIM](#)

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Your pet can be in danger of poisoning through herbicides.

You take care of your pets by making sure your dog or cat doesn't get into dangerous poisons or chew on electrical cords. But a serious danger might be under your pet's feet. Herbicides can be highly toxic to pets, and exposing your dog and cat may cause them to get very sick or even die.

### Significance

In 2006 the ASPCA's Poison Control Hot Line handled 2,329 calls pertaining to fertilizer exposure and 2,175 cases pertaining to chemical exposure.

### Function

Herbicides are intended to kill weeds. While herbicides are not dangerous to pets after they've dried, others are very poisonous.

### Identification

One deadly herbicide is paraquat. According to *Veterinary Medicine*, in 2003 more than seven dogs died in Portland, Oregon, due to exposure to paraquat.

### Prevention/Solution

Don't use herbicides on your lawn, or if you must, use those labeled as safe for pets.

### Warning

Some herbicides are so toxic that they've actually been linked to cancer. According to the *New York Times*, dogs whose owners used 2,4-D herbicides had increased occurrences of lymphatic cancer.

**Avenger Weed Killer  
MSDS Comparisons  
And  
Product Comparisons**

# Product MSDS Comparisons

	Paraquat <sup>1</sup>	Glyphosate <sup>2</sup>	Burnout II Herbicide <sup>3</sup>	Nature's Avenger Organic Herbicide
<b>Synthesis:</b>	Synthetic	Synthetic	Synthetic (concentrated acetic acid)	Natural & Organic
<b>Product Efficacy:</b>	Excellent	Excellent	Fair to Good	Excellent
<b>EPA registration:</b>	Yes -- signal word: DANGER-POISON	Yes -- signal word: CAUTION	No -- signal word: DANGER	Yes -- signal word: CAUTION
<b>Toxicity parameters:</b>				
• Oral toxicity	Oral LD50: ranges from 20 to 70 mg/kg	Oral LD: > 5000 mg/kg	N/A: "Can cause burns and destroy tissue in the mouth, throat, and digestive tract."	Oral LD: > 5000 mg/kg
• Skin irritation potential	"may cause skin burns, dermatitis, and damage to fingernails"	Not irritating	"Will cause severe skin irritation and/or chemical burns."	Low to moderate potential for skin irritation
• Eye irritation	"can irritate, burn, and cause corneal damage and scarring of the eyes"	Limited irritation	"Contact will result in severe eye irritation and possible permanent damage."	Limited irritation
• Long-term Health and Chronic Effects	No evidence of carcinogenicity, teratogenicity, or reproductive effects. Lung problems in humans and dogs.	Recent research is showing links to cancer and other health issues	Data not available	No evidence of carcinogenicity, teratogenicity, or reproductive effects.
<b>Environmental Fate:</b>				
• Soil half-life (aerobic)	Persistent t <sub>1/2</sub> ~ 16 months	Moderately persistent t <sub>1/2</sub> ~ 47 days	Data not available	Rapid volatilization from dry and moist soils. Atmospheric t <sub>1/2</sub> ~ 2 hrs.

<sup>1</sup> Extension Toxicology Network: Pesticide Information Profile <http://pmep.cce.cornell.edu/profiles/extoxnet/>

<sup>2</sup> Extension Toxicology Network: Pesticide Information Profile <http://pmep.cce.cornell.edu/profiles/extoxnet/>

<sup>3</sup> St. Gabriel. Labs (manufacturer) Material Safety Data Sheet <http://www.biconet.com/lawn/burnout.html>

# Product General Comparisons

	<b>NATURE'S AVENGER ORGANIC WEED KILLER</b>	Other "Natural" Herbicides (Vinegars, acetic acids, etc.)	"Food Grade" Vinegar Herbicides	Synthetic/Chemical Herbicides (glyphosates)
<b>EPA Registered</b>	<b>YES</b> EPA reg. number on our label. NAO is regulated by the EPA on our label, our claims and our website. We can make no claims without proper documentation supporting our claim.	NO Known as a 25b product. Not regulated by EPA and can make any claim they want. Ingredients must come from the 25b list but can be synthetically altered	NO Known as a 25b product. Not regulated by EPA and can make any claim they want. Ingredients must come from the 25b list but can be synthetically altered	YES
<b>OMRI Listed</b>	<b>YES</b>	NO	NO	NO
<b>USDA NOP Approved for Use in Organic Production and Organic Gardening</b>	<b>YES</b>	NO	NO	NO
<b>Award winner</b>	<b>YES</b> MGA 2008 Green Thumb Award	NO	NO	NO
<b>Fast Acting</b>	<b>YES</b> Visible results seen in 2 hrs or under	NO 4-24 hours	NO 4-24 hours	NO 7-10 days
<b>Effective: Proven and Tested</b>	<b>YES</b> numerous university and professional trials both in US and internationally	Varies	Varies	YES
<b>Non-Toxic: Safe to use around people, pets, wildlife, environment, ground water supplies</b>	<b>YES</b> mild irritant, dissipates quickly, no harm people, animals or the environment	NO Highly corrosive, dangerous for eyes, nose and throat - see MSD sheet	NO EXTREMELY corrosive, dangerous for eyes, nose and throat (can cause blindness)- see MSD sheet	NO stay off lawn time, skull and cross bones posting required
<b>Pleasant Scent</b>	<b>YES</b> <b>Natural Fresh Citrus Aroma</b>	NO chemical and clove smells	NO chemical and clove smells	NO chemical smell

# **Avenger Weed Killer**

**The proof is in the testing results...**

# Michigan State University

## Dr. Donald Penner

***“Avenger RTU Herbicide is the best organic herbicide I’ve ever tested.”***

Dr. Donald Penner, Professor of Crop & Soil Sciences,  
Michigan State University

# Degreasing Properties:

Scanning Electron Micrograph (MSU)  
8-wk old Velvetleaf Plant Leaf Surface



**10% Limonene**



**Distilled Water**

# Avenger Weed Killer Field Research Results

## Florida Field Trials

### RTU vs. Roundup

Dr. Robert Johnson, Ag consulting, Inc.

Locations: Lake Jem and Zellwood, FL

*“Avenger RTU was fast acting and effective  
in controlling the weeds.”*

*“It was faster acting than Roundup...”*

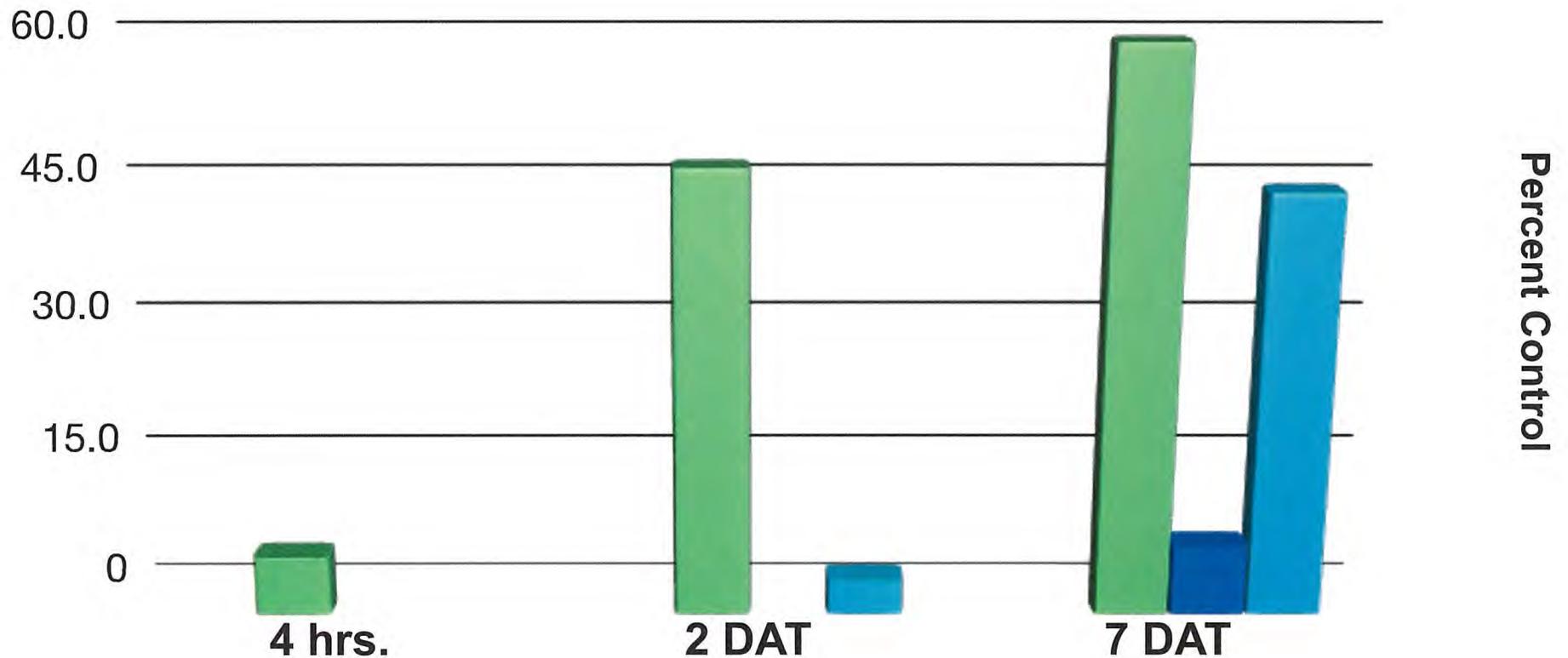
*“And more effective than Roundup at 1.5 pts per acre and [equal to]  
or more effective than Roundup at 0.75 ounces per gallon*

# Trial Protocol

- 4 reps per treatment. Each plot is 8 ft. X 20 ft.
- Equivalent of 150 gallons/acre applied (most companies assume homeowners spray 200 GPA)
- 2 rates of Roundup were used:
  1. 1.5 pts/A (agricultural rate)
  2. 0.88 gal/A (homeowner rate)
- CO<sub>2</sub> back pack sprayer with single wand to mimic homeowner and professional/landscaper spray
- Statistical analyses are available

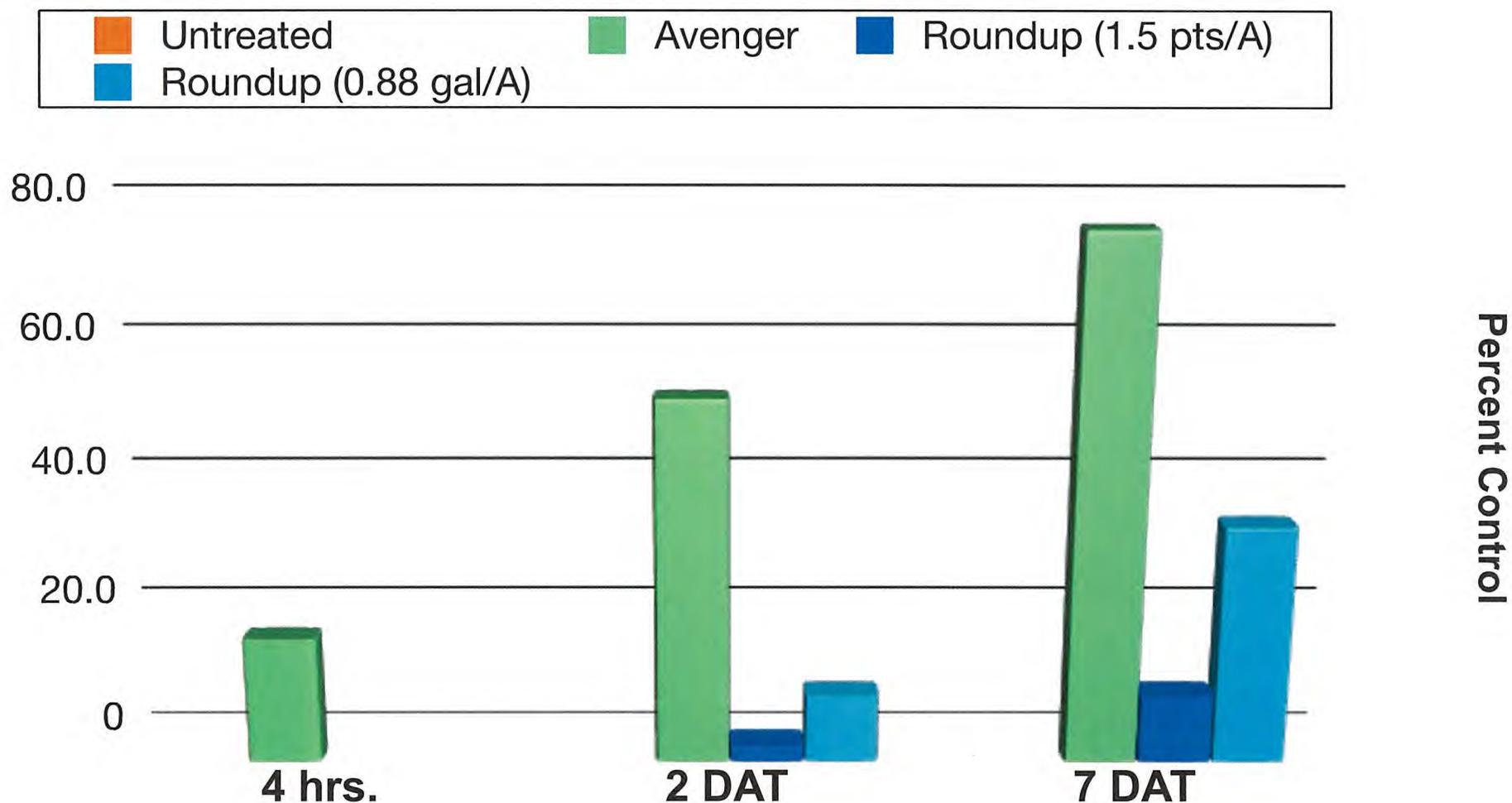
*Note: DAT = Days After Treatment*

## Yellow Nutsedge Control (*Cyperus esculentus*)



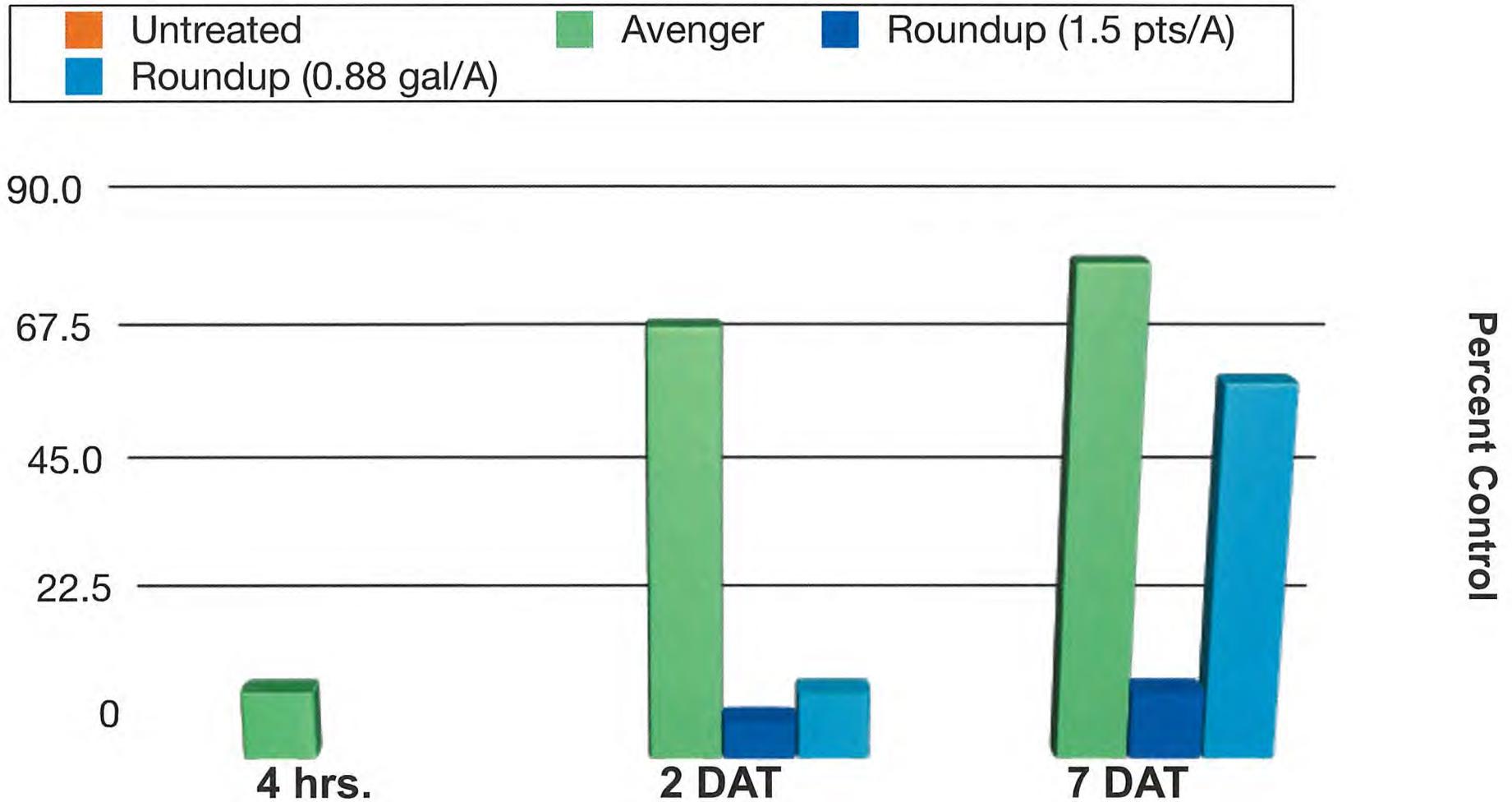
Equivalent of 150 gallons/acre sprayed for all 3 products.  
Dr. R. Johnson, Ag Consulting, Lake Jem, FL  
August, 2005

## Hemp Sesbania Control (*Sesbania exaltata*)



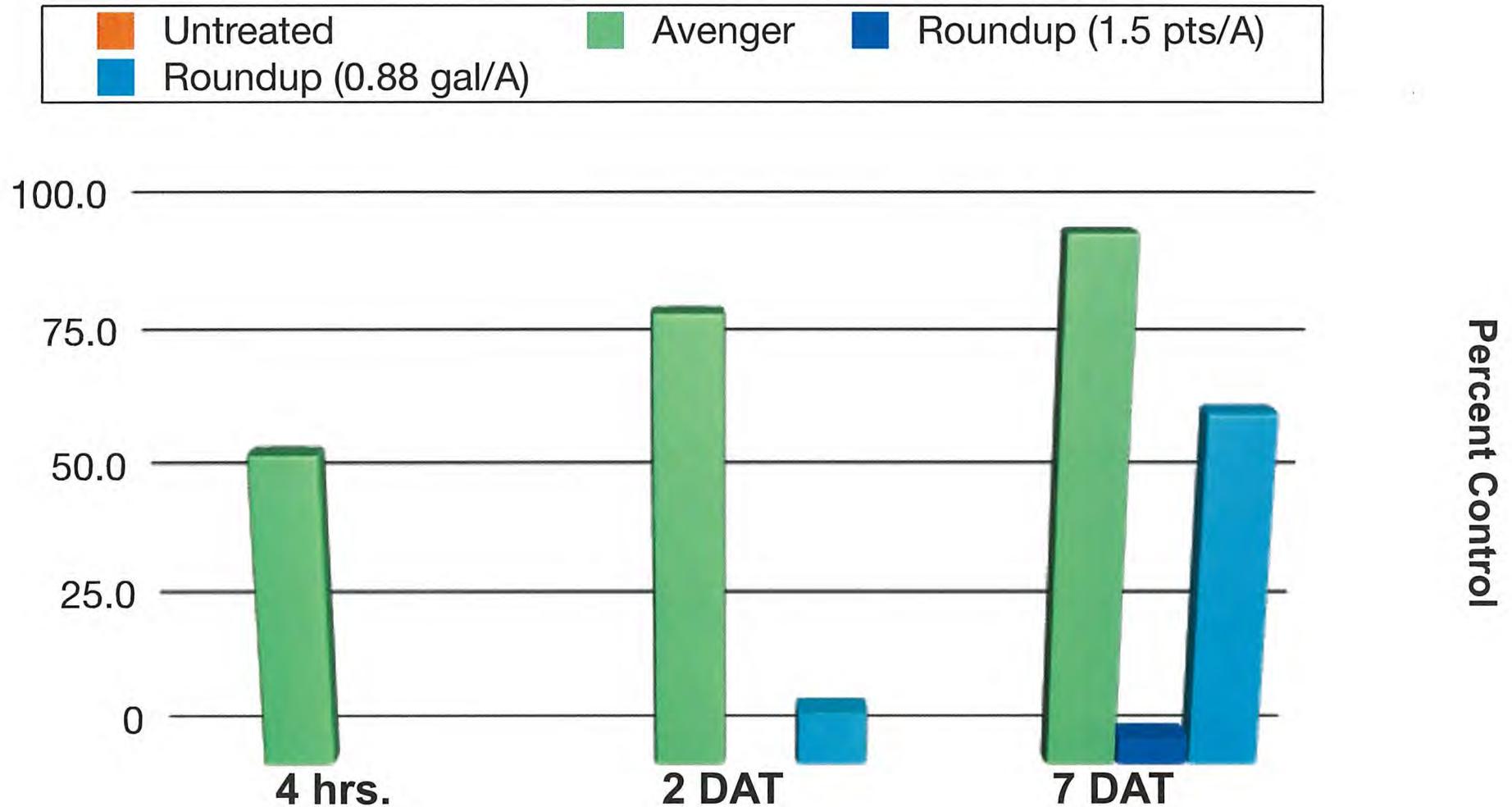
Equivalent of 150 gallons/acre sprayed for all 3 products.  
Dr. R. Johnson, Ag Consulting, Lake Jem, FL  
August, 2005

## Goosegrass Control (*Eleusine indica*)



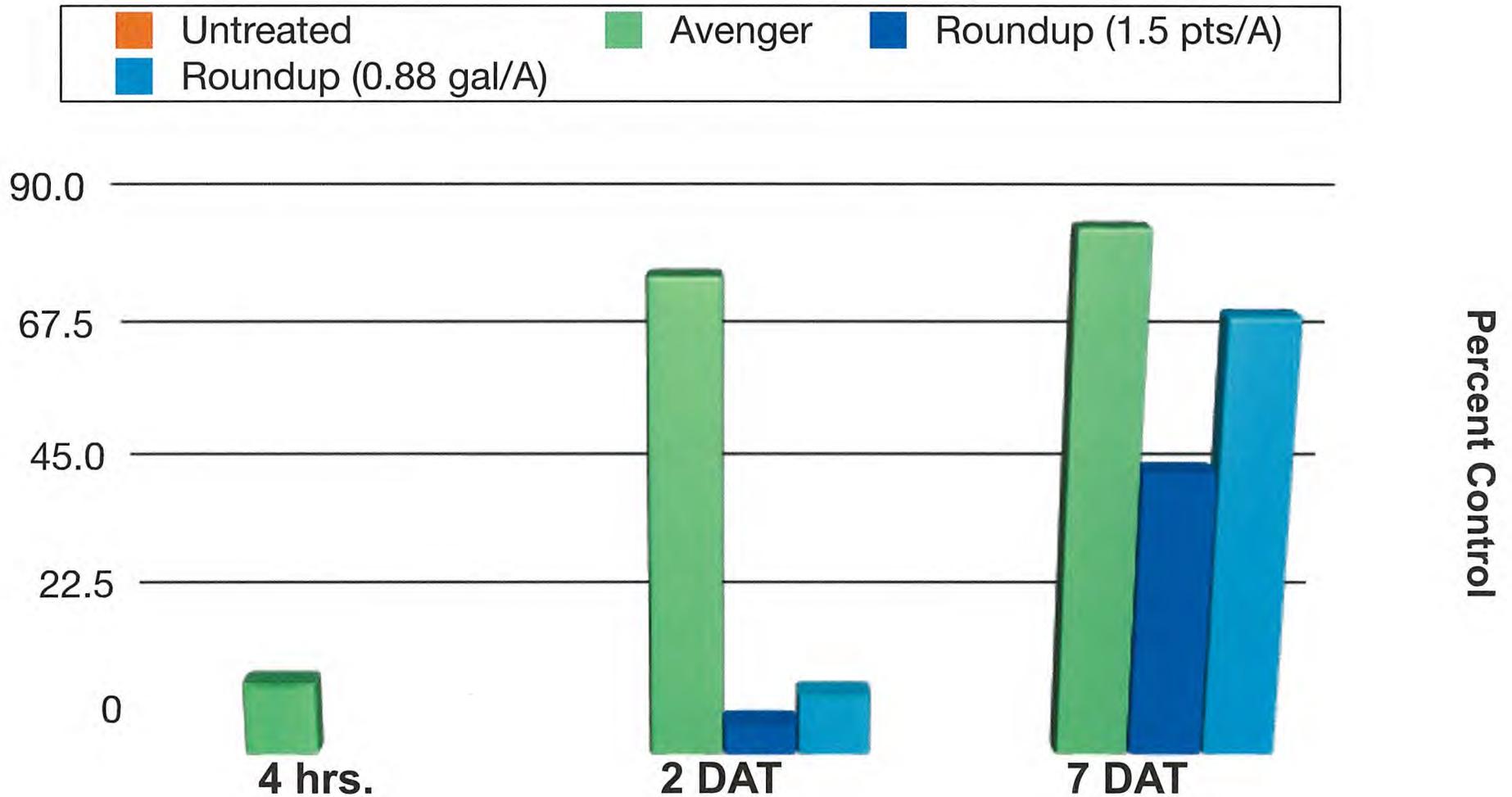
Equivalent of 150 gallons/acre sprayed for all 3 products.  
Dr. R. Johnson, Ag Consulting, Lake Jem, FL  
August, 2005

## Purslane speedwell Control (*Veronica peregrina*)



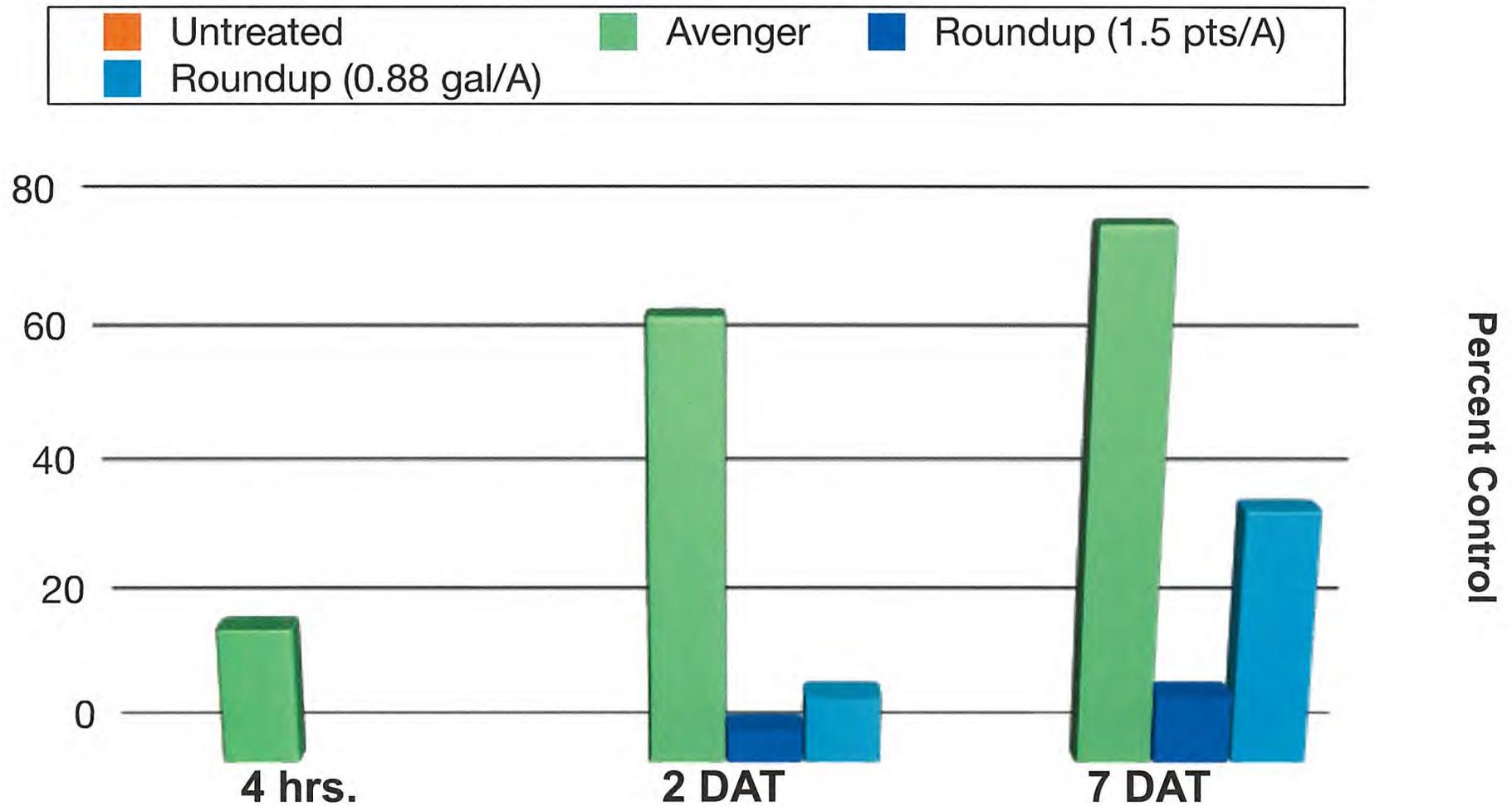
Equivalent of 150 gallons/acre sprayed for all 3 products.  
Dr. R. Johnson, Ag Consulting, Lake Jem, FL  
August, 2005

## Crabgrass Control (*Digitaria spp.*)



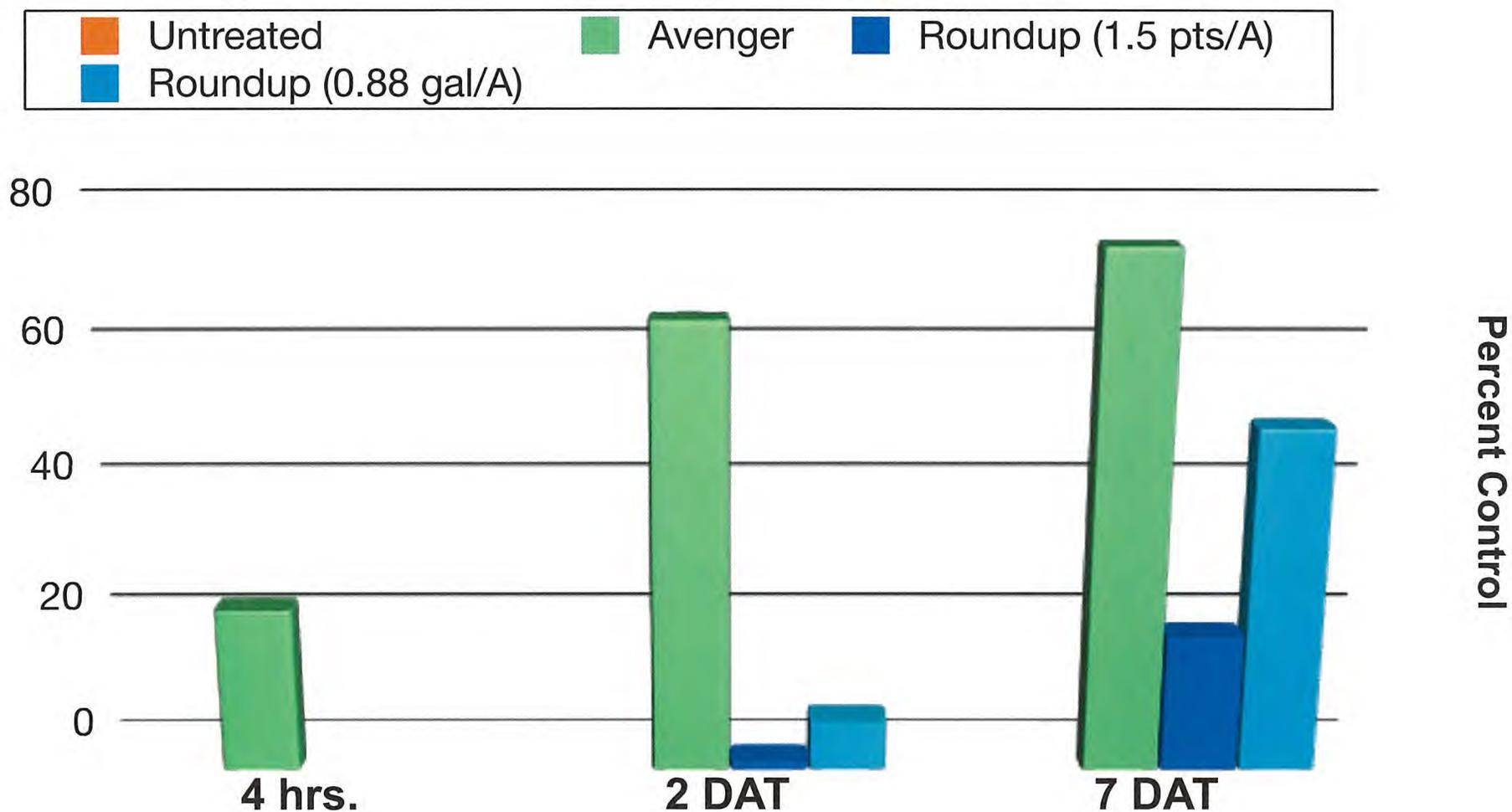
Equivalent of 150 gallons/acre sprayed for all 3 products.  
Dr. R. Johnson, Ag Consulting, Lake Jem, FL  
August, 2005

## Smartweed Control (*Polygonum spp.*)



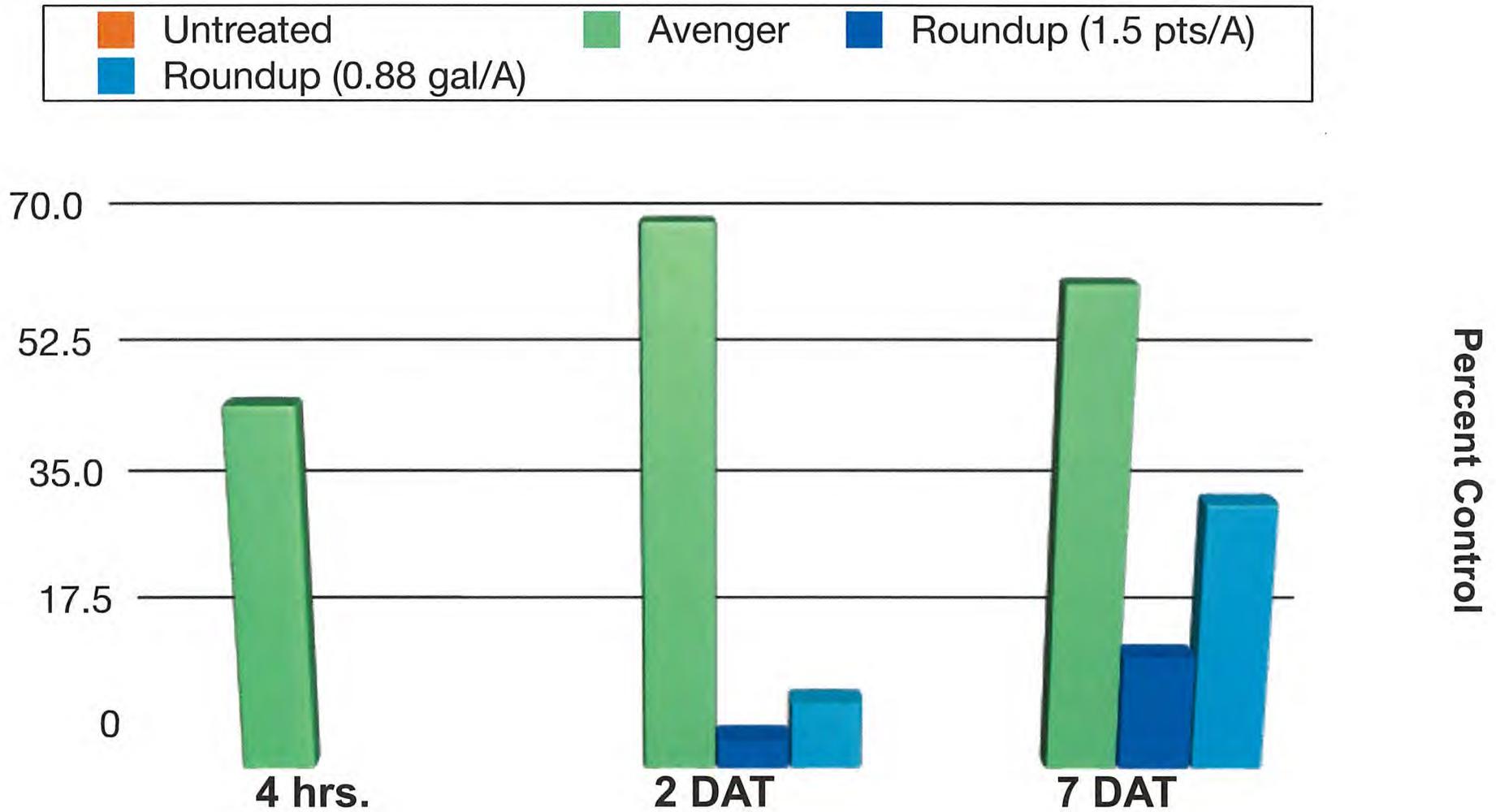
Equivalent of 150 gallons/acre sprayed for all 3 products  
Dr. R. Johnson, Ag Consulting, Lake Jem, FL  
August, 2005

## Knotweed Control (*Mullugo spp.*)



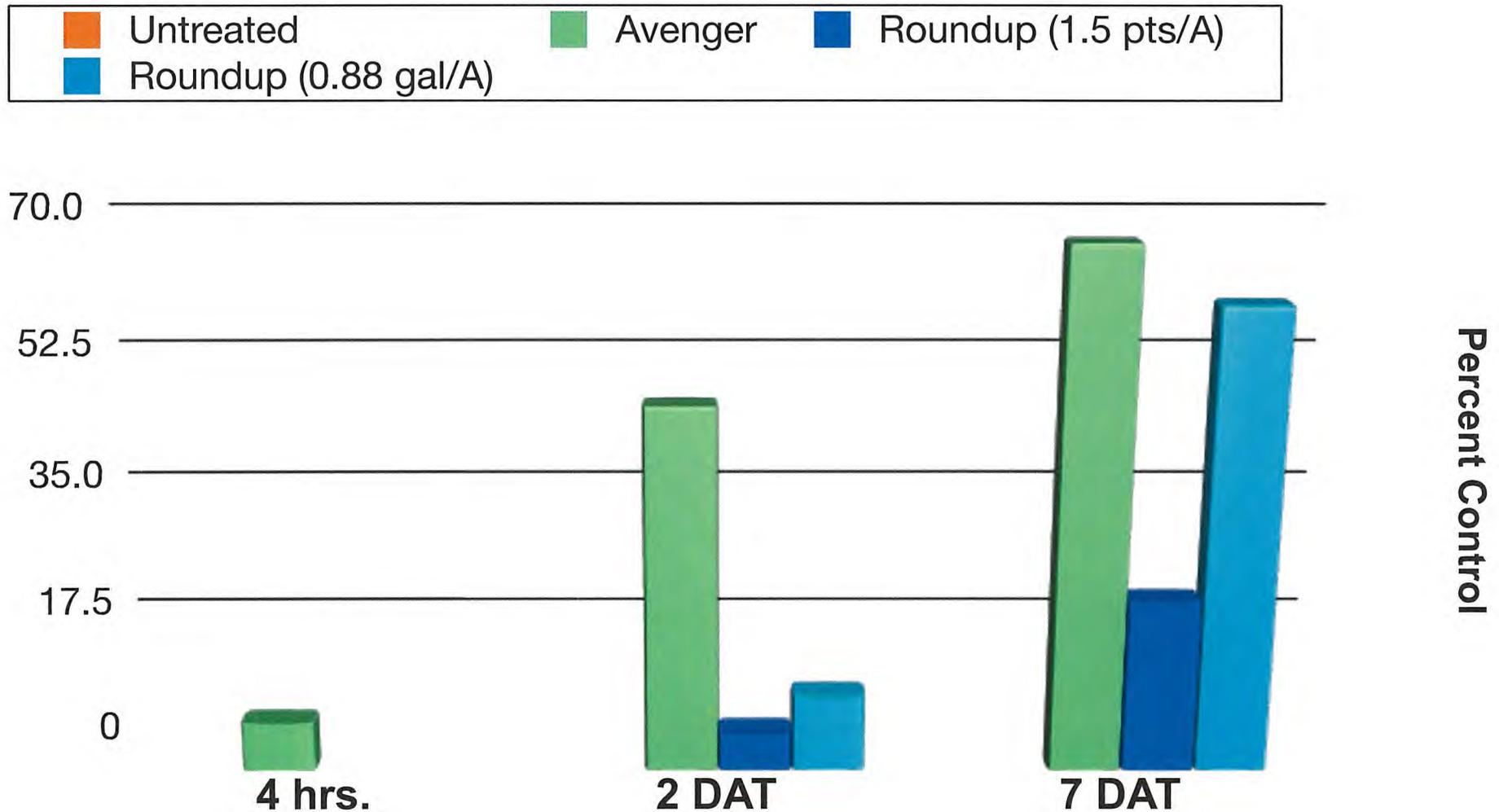
Equivalent of 150 gallons/acre sprayed for all 3 products  
Dr. R. Johnson, Ag Consulting, Lake Jem, FL  
August, 2005

## Morning glory Control (*Ipomoea spp.*)



Equivalent of 150 gallons/acre sprayed for all 3 products.  
Dr. R. Johnson, Ag Consulting, Zellwood, FL  
August, 2005

## Florida pusley Control (*Ricardia scabra*)



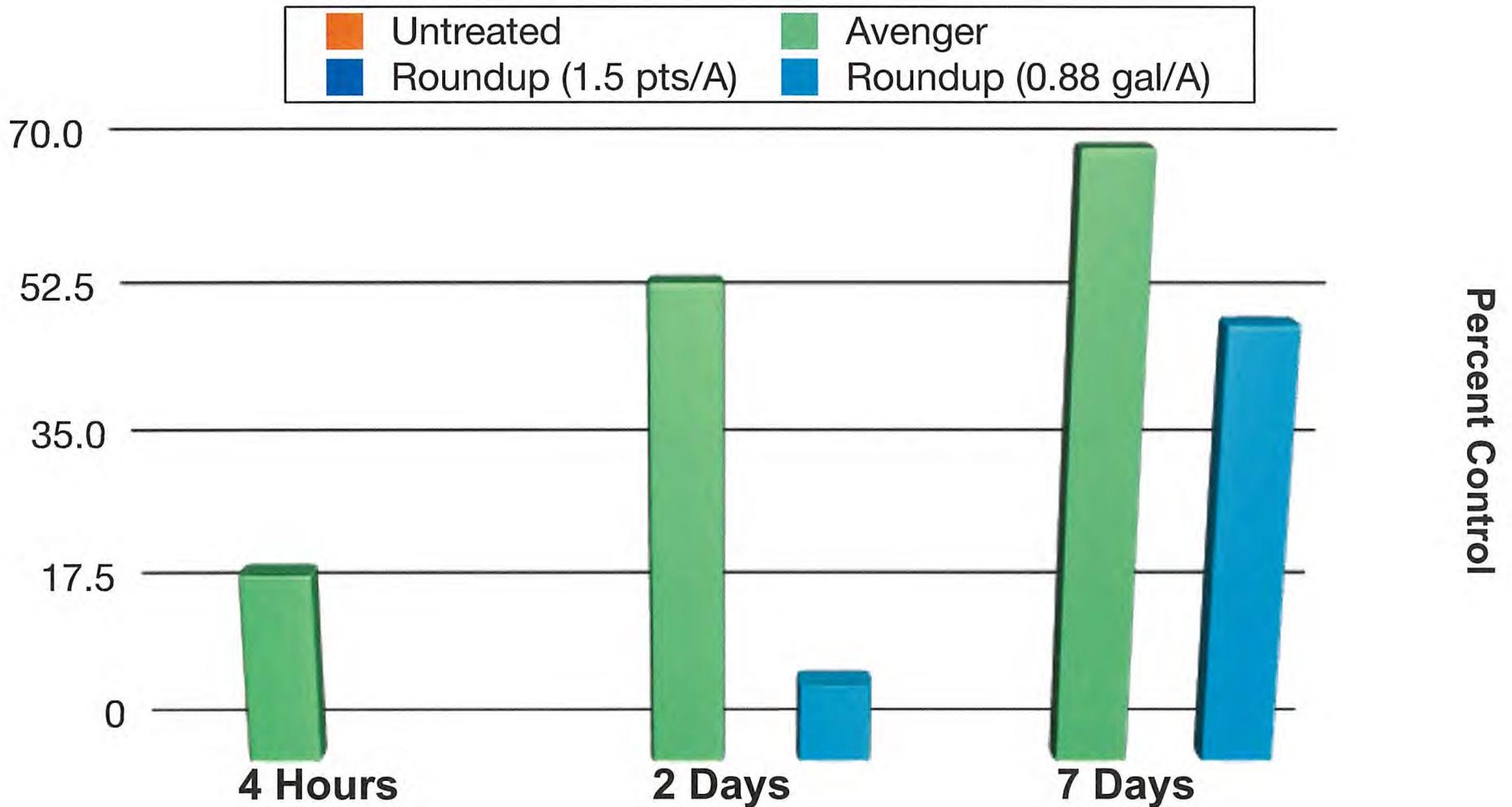
Equivalent of 150 gallons/acre sprayed for all 3 products.

Dr. R. Johnson, Ag Consulting, Zellwood, FL

August, 2005

# Grass Control: Average of 6 Trials

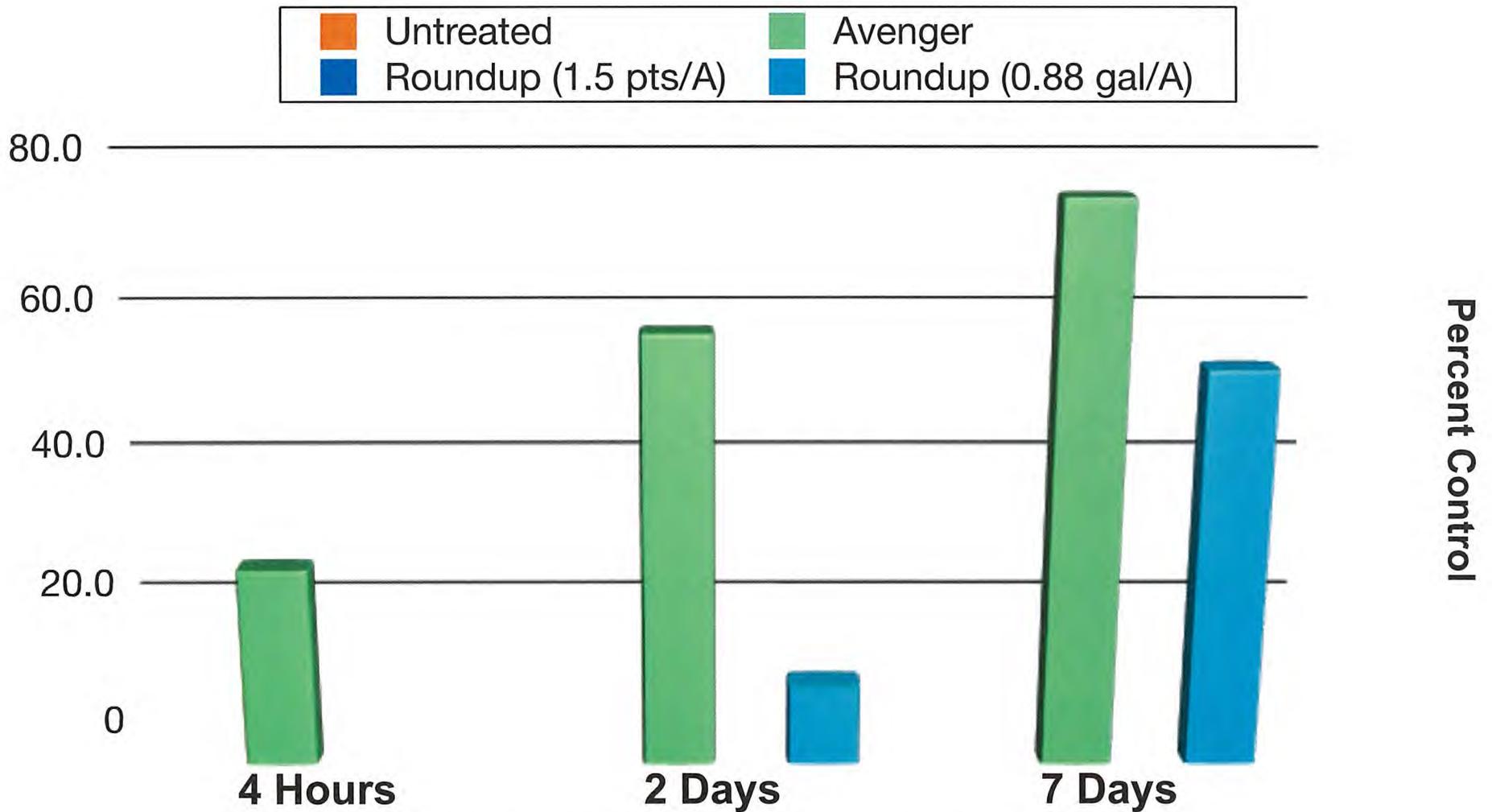
(goosegrass, yellow nutsedge, crabgrass, bahiagrass)



Equivalent of 150 gallons/acre sprayed for both products  
Dr. R. Johnson, Ag Consulting, FL  
August, 2005

# Broadleaf Control: Average of 8 Trials

(morning glory, sandbur, F. pusley, beggerticks, sesbania, purslane, smartweed, knotweed)



Equivalent of 150 gallons/acre sprayed for both product  
Dr. R. Johnson, Ag Consulting, FL  
August, 2005

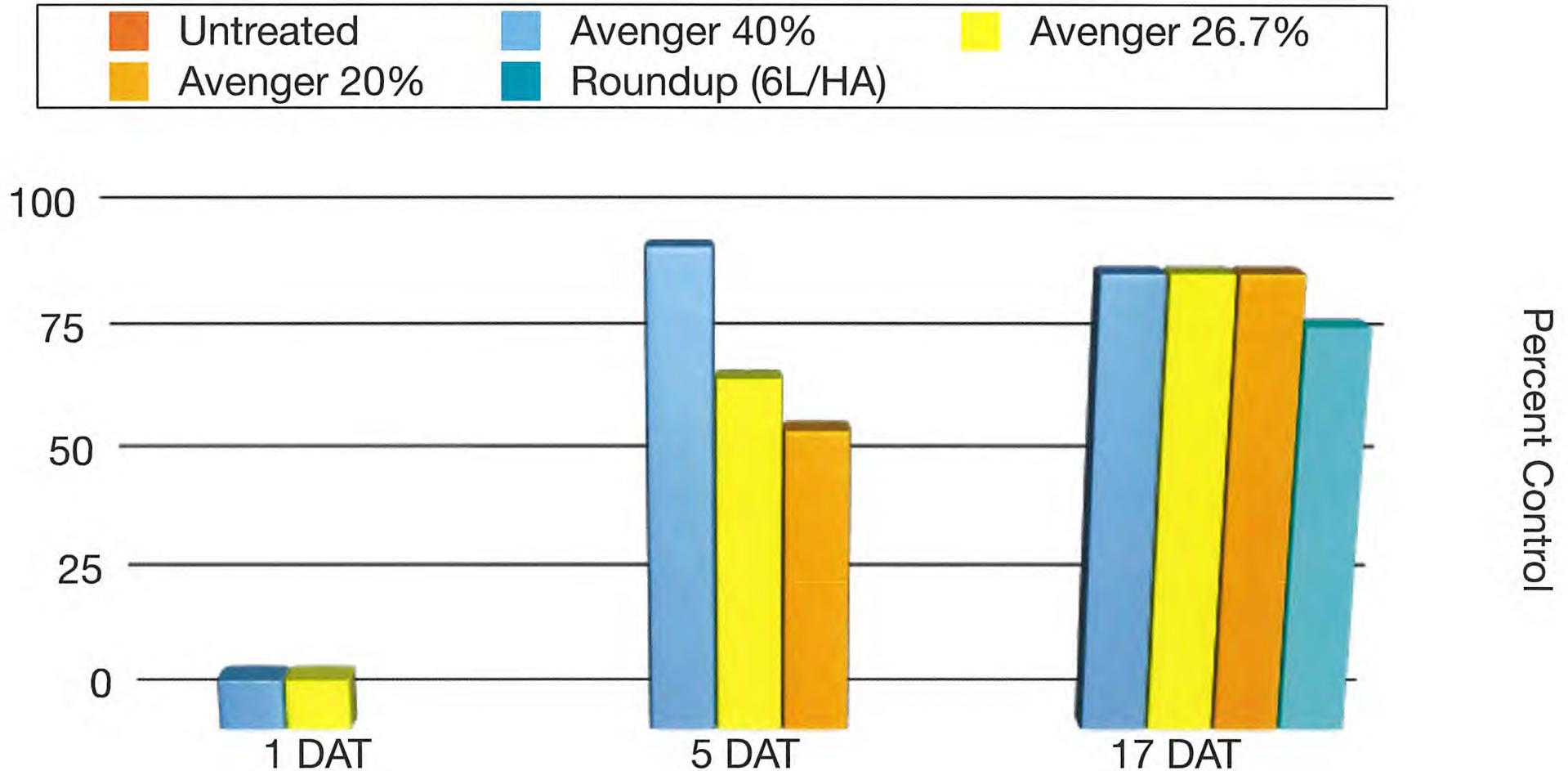
# Field Trials in France

Solevi S.A.R.L. Crest, France, November, 2005

## Solevi Trials Observations

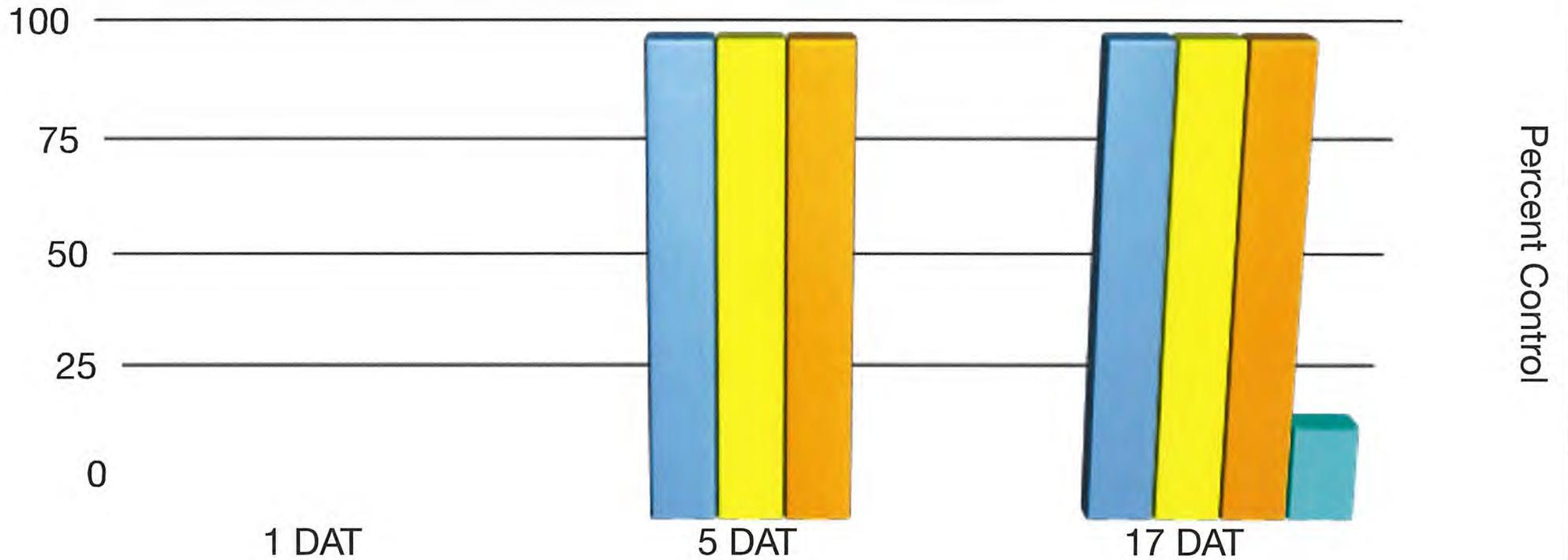
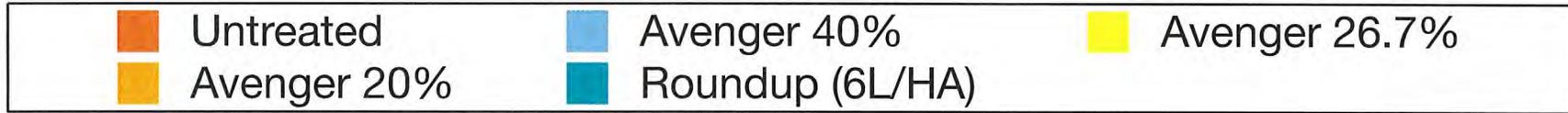
- **Avenger faster acting than Roundup**
  - **For first 5 days after treatment, Avenger substantially outperformed Roundup**
- **Avenger has a broader spectrum than Roundup**
  - **Roundup is good grass herbicide but not as effective on some broadleaf weeds**

# Ray-grass, Italian



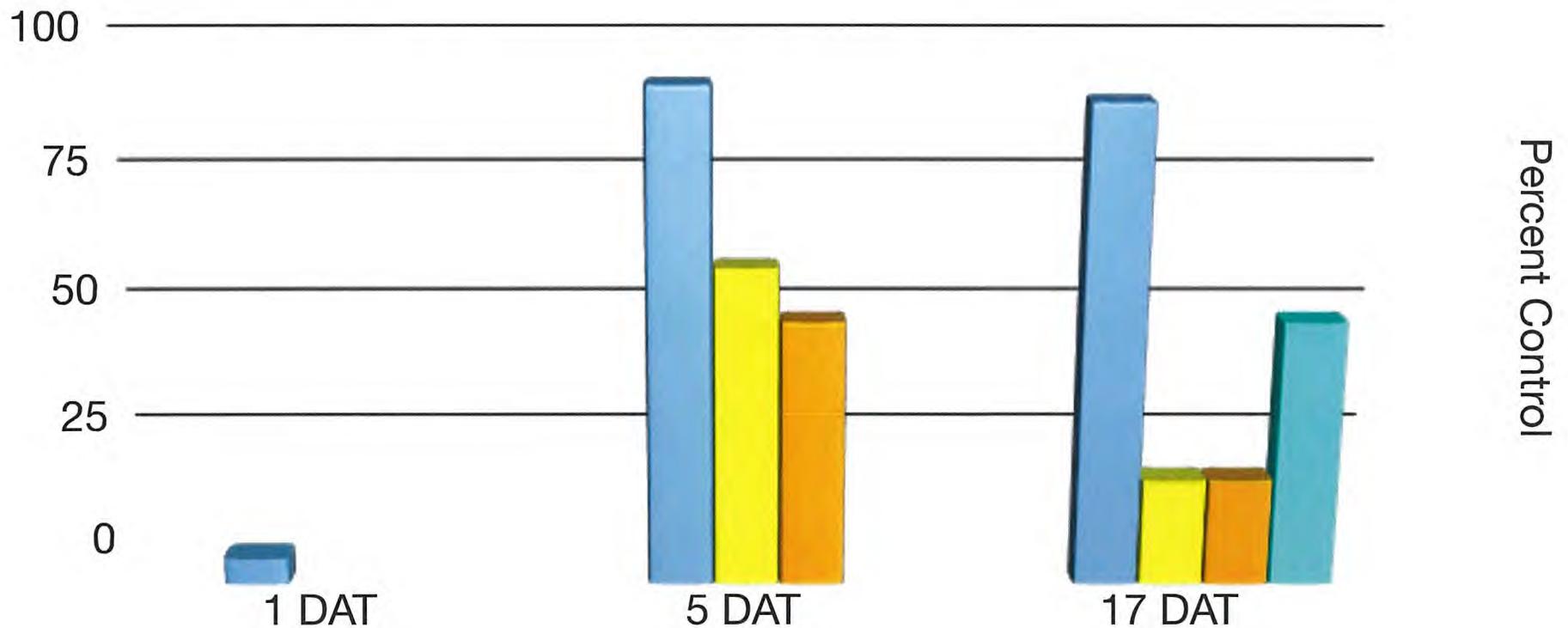
Equivalent of 200 G/A for Avenger. 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# *Stellaria media*



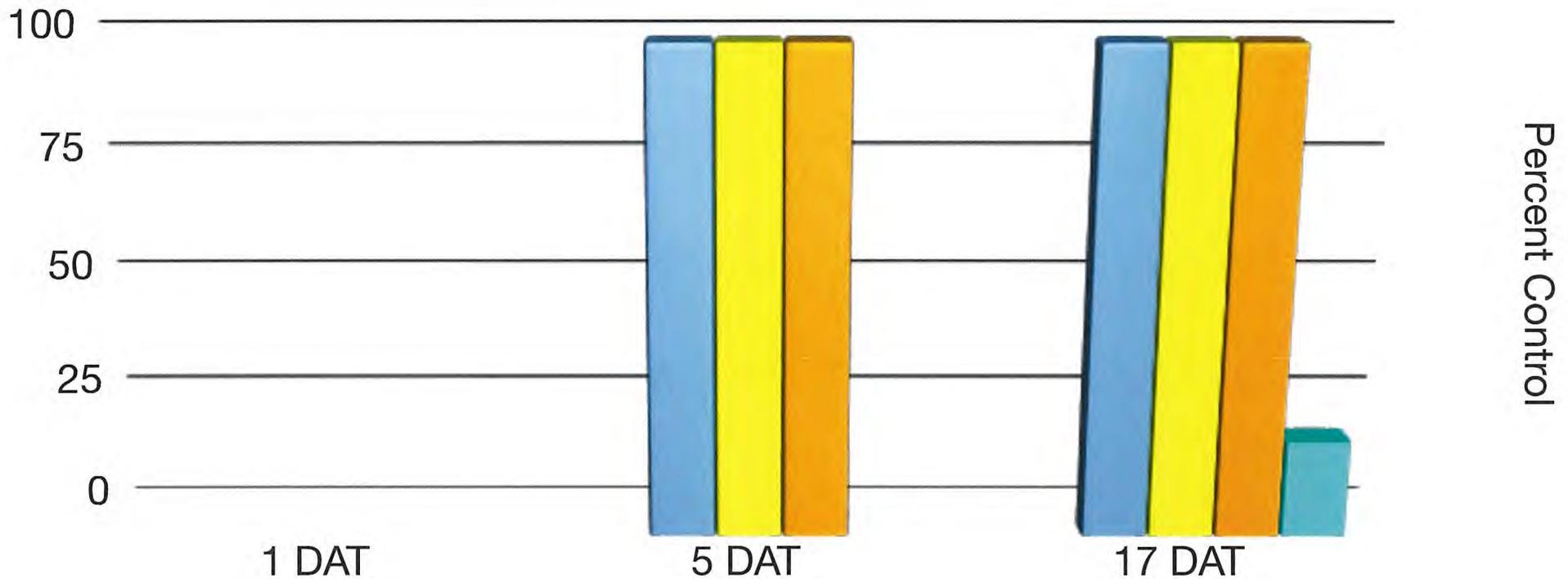
Equivalent of 200 G/A for Avenger. 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# *Raphanus raphanistrum*



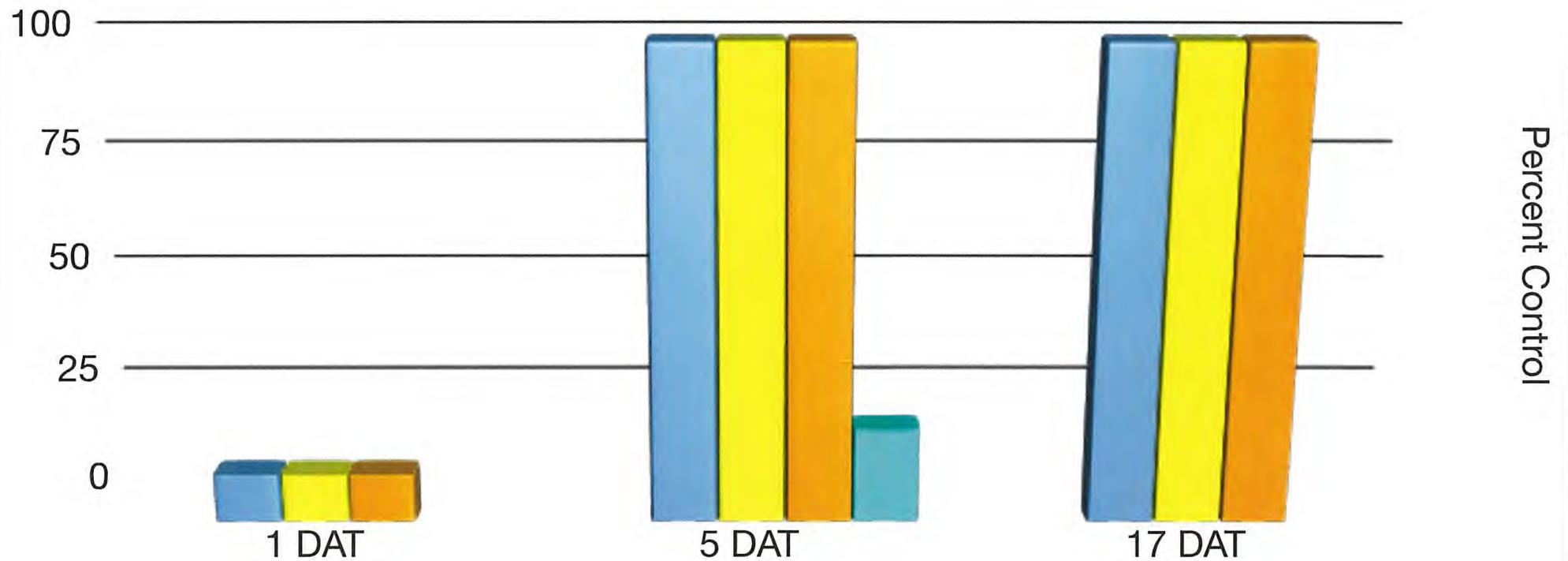
Equivalent of 200 G/A for Avenger. 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# *Spergula sp.*



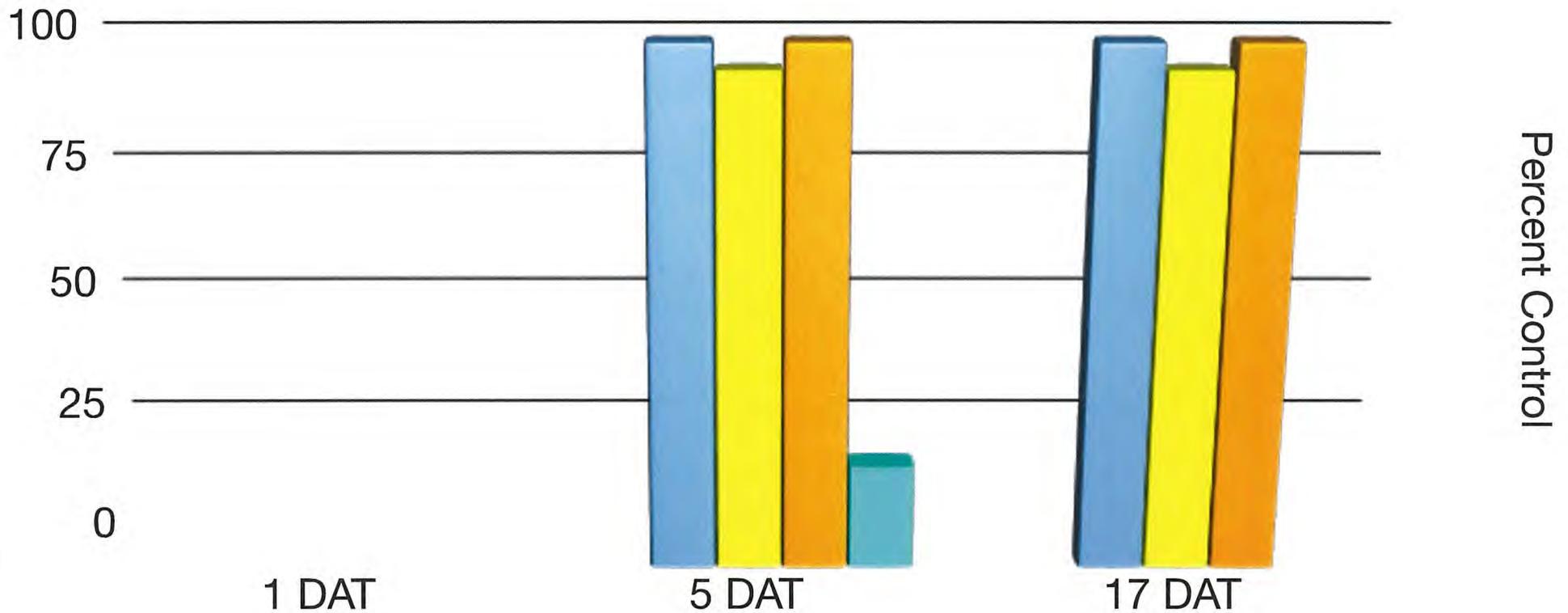
Equivalent of 200 G/A for Avenger. 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# *Luzerne trachetée*



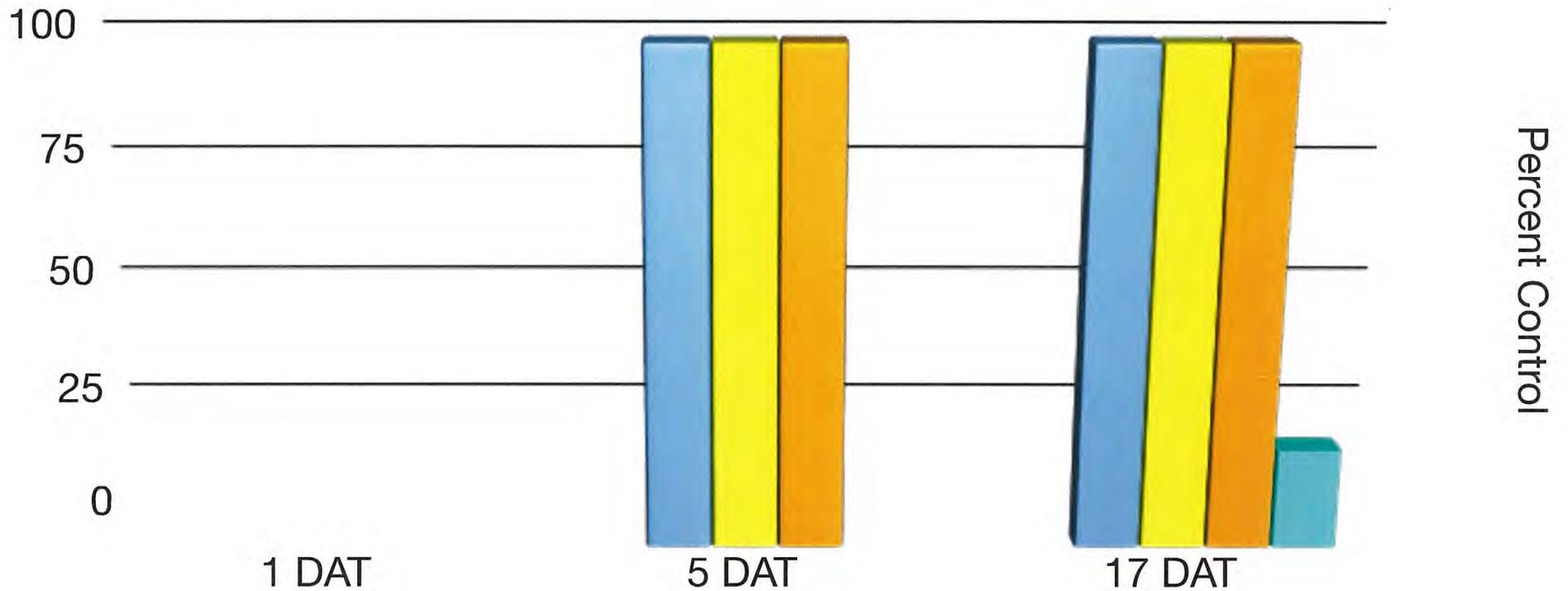
Equivalent of 200 G/A for Avenger. 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# *Poa annua*



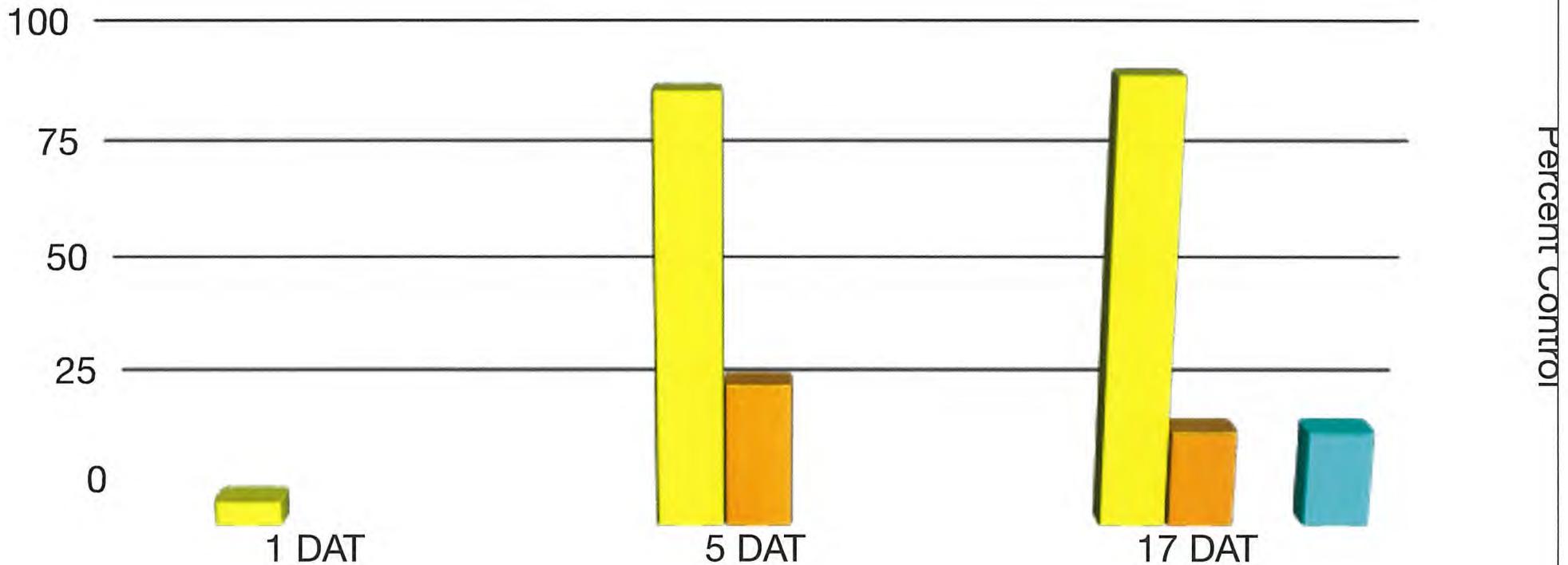
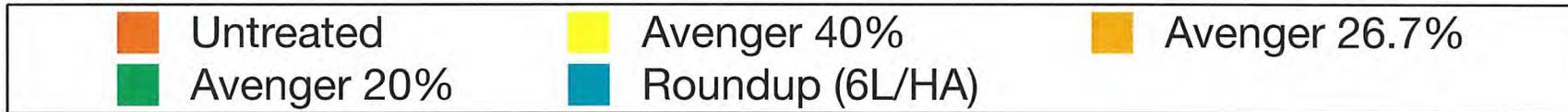
Equivalent of 200 G/A for Avenger. 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# *Cerastium tomentosum*



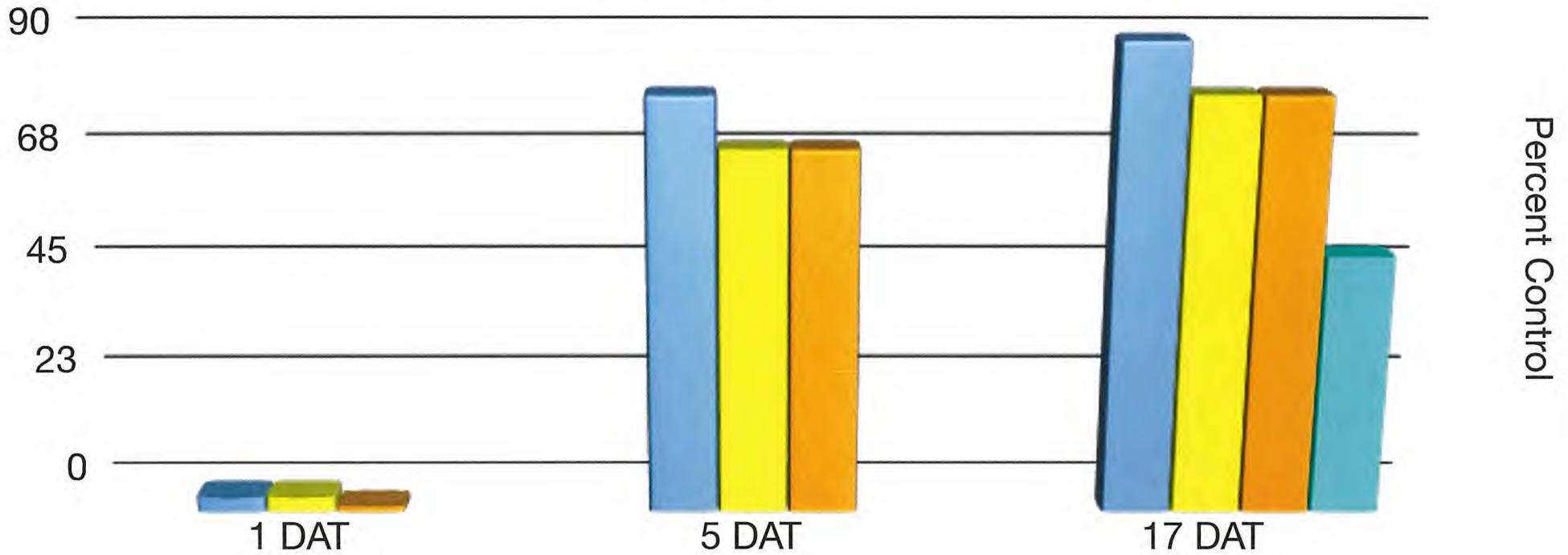
Equivalent of 200 G/A for Avenger. 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# *Plantago lanceolata*



Equivalent of 200 G/A for Avenger (20% Not Rated). 50 G/A for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

# All Weeds (average of 8 trials)



Equivalent of 2000 L/HA . 500 L/HA for Roundup.  
Solevi S.A.R.L. Crest, France, November, 2005

**Avenger Weed Killer**  
**Need more proof?**  
**Seeing is believing...**

# Walnut berm Yuba City, CA Jan '07

UT vs 3 wks 1:6 @ 60 gpa



Untreated



Avenger 1:6, 60 gpa

**Walnut berm** Yuba City, CA Jan '07 UT vs 3 wks 1:6 @ 60 gpa



**Chickweed** Yuba City, CA Jan '07

**1 hr vs 3 wks 1:6 @ 60 gpa**



**Mustard** Yuba City, CA Jan '07

1 hr vs 3 wks 1:6 @ 60 gpa



**Fiddleneck Yuba City, CA Jan '07      1 hr vs 3 wks 1:6 @ 60 gpa**



# Sowthistle Yuba City, CA Jan '07

1 hr vs 3 wks 1:6 @ 60 gpa



# Clover Yuba City, CA Jan '07

1 hr vs 3 wks 1:6 @ 60 gpa



**Wild Oats** Yuba City, CA Jan '07

1 hr vs 3 wks 1:6 @ 60 gpa



## Redstem Filaree Yuba City, CA Jan '07 1 hr vs 3 wks 1:6 @ 60 gpa



## **MOSS** Yuba City, CA Jan '07

**1 hr vs 3 wks 1:6 @ 60 gpa**



## Wild Barley Yuba City, CA Jan '07

1 hr vs 3 wks 1:6 @ 60 gpa



# Yes, We Like To Brag!

Avenger Weed Killer is getting attention because it works and is extremely environmentally friendly. Here are some of the things we are extremely proud of:

## **Fast Acting Organic Weed Killer Helps in Restoration of Washington DC's National Mall Lawn**

**"Cutting Edge" Georgia Company Participates in the Revitalization Project on the Capital's National Mall Lawns With [SafeLawns.org](http://SafeLawns.org), the National Park Service and the Environmental Protection Agency**

BUFORD, GA (November 5, 2007) - [Cutting Edge Formulations, Inc.](http://CuttingEdgeFormulations.com), inventor and manufacturer of Nature's Avenger Organic Weed Killer, announced their involvement in the revitalization project on our Capitol's National Mall Lawn that includes [SafeLawns.org](http://SafeLawns.org), the National Park Service (NPS) and the Environmental Protection Agency (EPA). Kicked off in late September, these organizations joined forces to attempt one of the highest profile organic lawn makeovers.

Cutting Edge Formulations, Inc. donated gallons of Nature's Avenger Organic Weed Killer, valued at over \$2,500, to the National Mall Project and [SafeLawns.org](http://SafeLawns.org) used it to burn-down existing grass and weeds. Nature's Avenger was used due to its quick breakdown, allowing immediate reseeding.

"We want to educate people about the benefits of organic lawn care and gardening," said [SafeLawns.org](http://SafeLawns.org) founder, [Paul Tukey](http://PaulTukey.com). "When this opportunity to help revitalize one of the most trampled and traveled on lawns in the country presented itself, [SafeLawns.org](http://SafeLawns.org) wanted to make sure we used the highest-quality organic products. After learning about Avenger Weed Killer we felt that using Cutting Edge's product would help us in this project."

"Cutting Edge is continually researching and developing innovative garden products that have a positive impact on our environment. Avenger Weed Killer has been university and field tested and found to be faster acting and just as effective as traditional synthetic herbicides such as glyphosate," said Mr. Jankauskas.

## More To Brag About!

### **In 2008 Cutting Edge won the coveted Green Thumb Award for its Avenger Weed Killer!**

The Mailorder Gardening Association's (MGA) Green Thumb Award is awarded to outstanding new garden products available by mail or online. Winners of the 2008 MGA Green Thumb Awards were chosen by an independent panel of garden writers and editors.

The winning products were selected based on their uniqueness, technological innovation, ability to solve a gardening problem or provide a gardening opportunity, and potential appeal to gardeners.

Clayton Beaty, of Beaty Fertilizer Company, Inc and Mills Magic Rose Mix, played an integral part of submitting Avenger Weed Killer for this award. "I think it's a great product and thought it deserved to get recognized for being not only a "green product" but for actually working and being a great alternative to synthetic herbicides on the market," said Mr. Beaty.

The awards are sponsored by the Mailorder Gardening Association, the world's largest nonprofit association of companies that sell garden products directly to consumers.



**And Even More....!**



## **Avenger Weed Killer is Going Global**

Cutting Edge Formulations is working with several countries around the globe in supplying Avenger Weed Killer and our AvengerAG products.

These countries have banned use of Roundup or any Glyphosate product and are excited to have a product that is highly effective and environmentally friendly.



## Just to Recap...

Avenger Weed Killer has finally hit its stride. People and countries around the world are seriously taking into consideration the condition of our planet and the many chemicals which are proven detrimental not only to the environment, but to all inhabitants.

Cutting Edge Formulations began this endeavor twelve years ago in the hopes that one day people would wake up and realize the need to use natural products to deal with natural obstacles. That day is here and Avenger Weed Killer is the product that works with nature instead of against it. After all, nature knows what nature needs and the world needs Avenger.

- EPA registered & approved
- Organic Materials Review Institute (OMRI) listed product.
- Approved for Use by the USDA National Organic Program
- Approved by the Washington Organic Food Program (WSDA)
- D-Limonene is Generally Recognized As Safe (GRAS) by the FDA
- USDA IR-4 Project participant
- Patented formula: US 8273687 B2, US 8153561 B2
- Made in the USA
- Fast acting – visible results in less than 2 hours
- Highly biodegradable – dissipates quickly
- Non-toxic and can be used in areas near people, pets and wildlife
- Works in cool & cloudy conditions (as low as 40° F)
- Does not stain brick, concrete or pavement
- Sprayed areas can be planted within hours
- Made from oranges, lemons and other citrus fruits.
- A pleasant citrus aroma.