

“How about it, Baby?”



“What part of “NO” don’t you understand?”



"How about it yourself, Big Boy?"



A Consultant's Perspective on
Managing
Weed Resistance
**Louisiana Agricultural Consultants
Association**

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Resistance

The ultimate fate of any
pesticide/pharmaceutical with
extensive use = resistance

Factors

- Exposure, Extent of use;
- Mode of Action;
- Biology of Pest;
- Reproduction
 - Rhizomes or stolons
 - Seed dispersal
 - Seed dispersal levels

ETC.

- Some materials widely used for years with few documented problems;
- Others may be very short-lived.

- Alan York expected ALS resistance in Ryegrass to develop in as soon as 5 years where Osprey, and later Axial got labeled for small grains.....

- But it actually happened in 3 years.

Current Problems

With Glyphosate resistance problems are becoming well documented:

- **Scope**
- **Species**
- **Severity - Expanding Rapidly**

- Common glyphosate-resistant problems:
 - Palmer amaranth
 - Horse weed
 - Water hemp in LA?

Herbicide Resistance: Dilemma In Dixie





HISTORICAL PERSPECTIVE

- Almost hard to remember when RoundUp Ready crops were not commonplace.
- They have become so dominant.

MY OWN EXPERIENCE

- Finished college about 30 years ago;
- Started consulting business about 25 years ago;
- In early 80's, managing weed resistance was not really on my radar screen;
- DNA Goose grass resistance had developed on NC/SC border where crop mix was cotton and soybeans, and the only available herbicides for grasses were DNA's; and

- Boll Weevil and other factors caused NC to reduce acreage from almost 2 million acres cotton in the 50's to about 50,000 by the 70's. All was grown in border counties of SC and VA.

McLawhorn Crop Services, Inc.

- At start of consultant business, the crop mix was corn, soybeans, wheat, tobacco, some peanuts and vegetables.

PRE-SEASON PRODUCTION PLANS

- Soil samples/Nematode assays;
- Fertility recommendations; and
- Variety selections.

IN-SEASON SCOUTING PROGRAM

- Insect scouting
 - Not too hard to sell on tobacco and peanuts;
 - Isolated acres, small fields; and
 - Expensive to scout.

WEED MANAGEMENT

- Became very important in filling a gap In-Season and to growers as we developed total post-season programs for soybeans, utilizing new herbicides such as *Poast*, *Blazer*, and *Basagran*.

- We sold weed management programs based on our ability to save growers money, intensively managing weeds, often using sub-label rates (poor resistance management).

1985

- 10,000 acres of uninsured corn, averaging about 25 bushels/acre;
- Lots of Aflatoxin.

1986

- BWEP

- **1987**
Local used car dealer bought old cotton gin and we started cotton monitoring in mid-summer.

1988

- Had 3 excellent growers who successfully grew about 1200 acres.

1991

- Core growers produced about 25,000 acres;
- Next 15 years was cotton, cotton, cotton, cotton, cotton.....

2007-2008

- Low crop prices caused return to crop mix similar to 1996 – *Roundup, Roundup,*

20 Years Ago

- More complicated crop mix;
- Conventional tillage;
- Margins were tight;
- Both soil applied and post herbicides were very specific;
- Mattered if field had Yellow nutsedge versus Purple (nutsedge issue on all crops); or
- If Pigweed was present in fields where

20 Years Ago

- Kept very detailed records on field histories;
- Were using total post-emergence programs in soybeans, (had to correctly identify morningglory and grass species, for example, to recommend the correct rate;
- To mis-identify Tropic croton versus Prickly Sida would be a disaster.

5 Years Ago

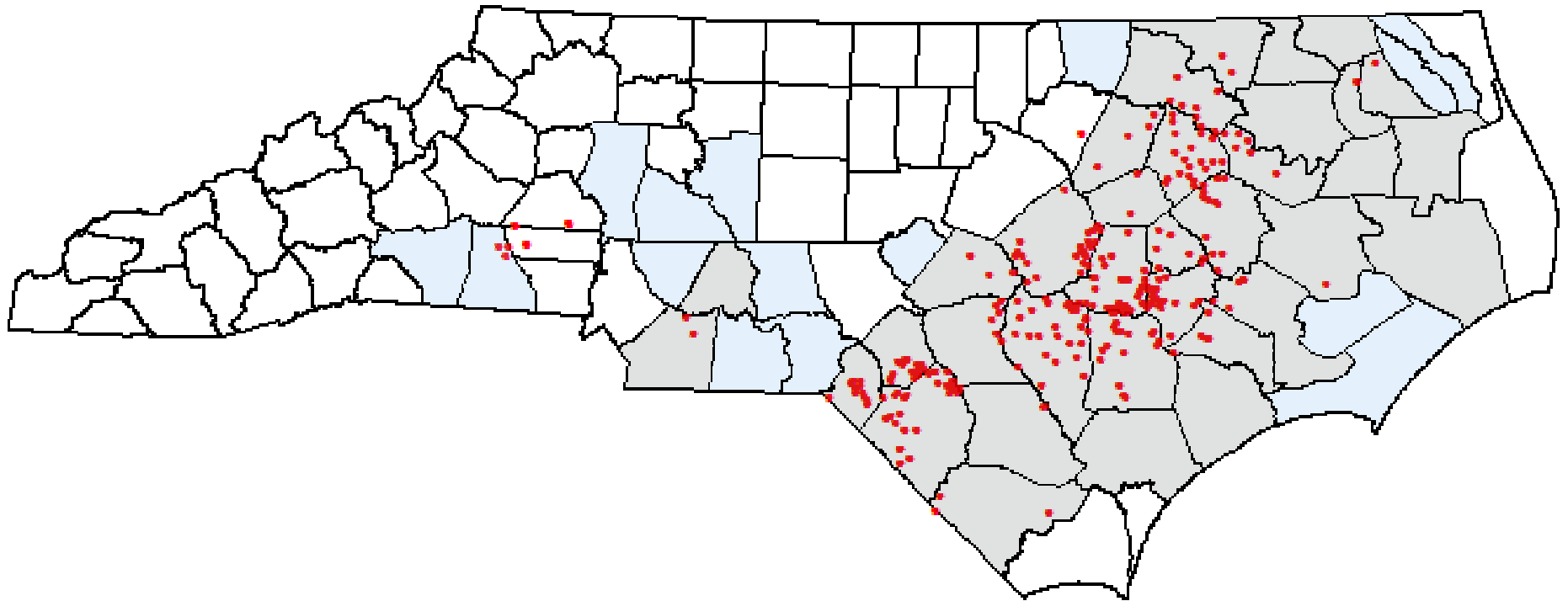
- *Roundup* Ready crops were dominant (mostly cotton);
- We got lazy—mainly focused on post-emergence programs and what *Roundup* would not control;
- Used multiple modes of action, with *Atrazine* in corn and *Caparol*, *MSMA* and others in cotton, *2,4D* in tank with burndowns, but recordkeeping got lax.

- Early problems with cotton fruit loss, in our area and others made it easy to maintain habit of adding *Caparol / Cotoran / MSMA / Bladex* (when available).

Herbicide Resistance: Dilemma In Dixie



290 Fields Sampled in Fall 2005





Known susceptible
population



Untreated ← Treated →

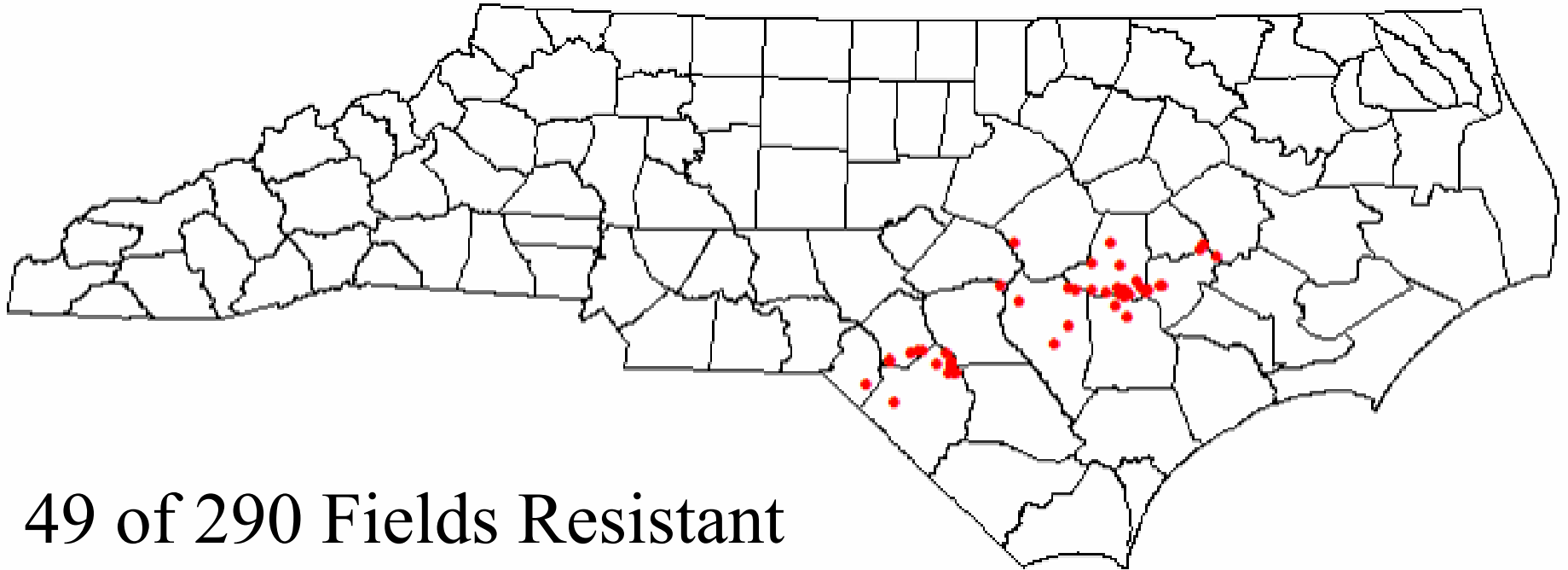


Untreated ← Treated →

Level of resistance
ranges from 3 to 20X



Untreated ← Treated →



49 of 290 Fields Resistant
Located in 11 Counties

Have to shock people to get their attention.



North Carolina, 2006

Mid-
July



Untreated



Treated

Mid-
Oct





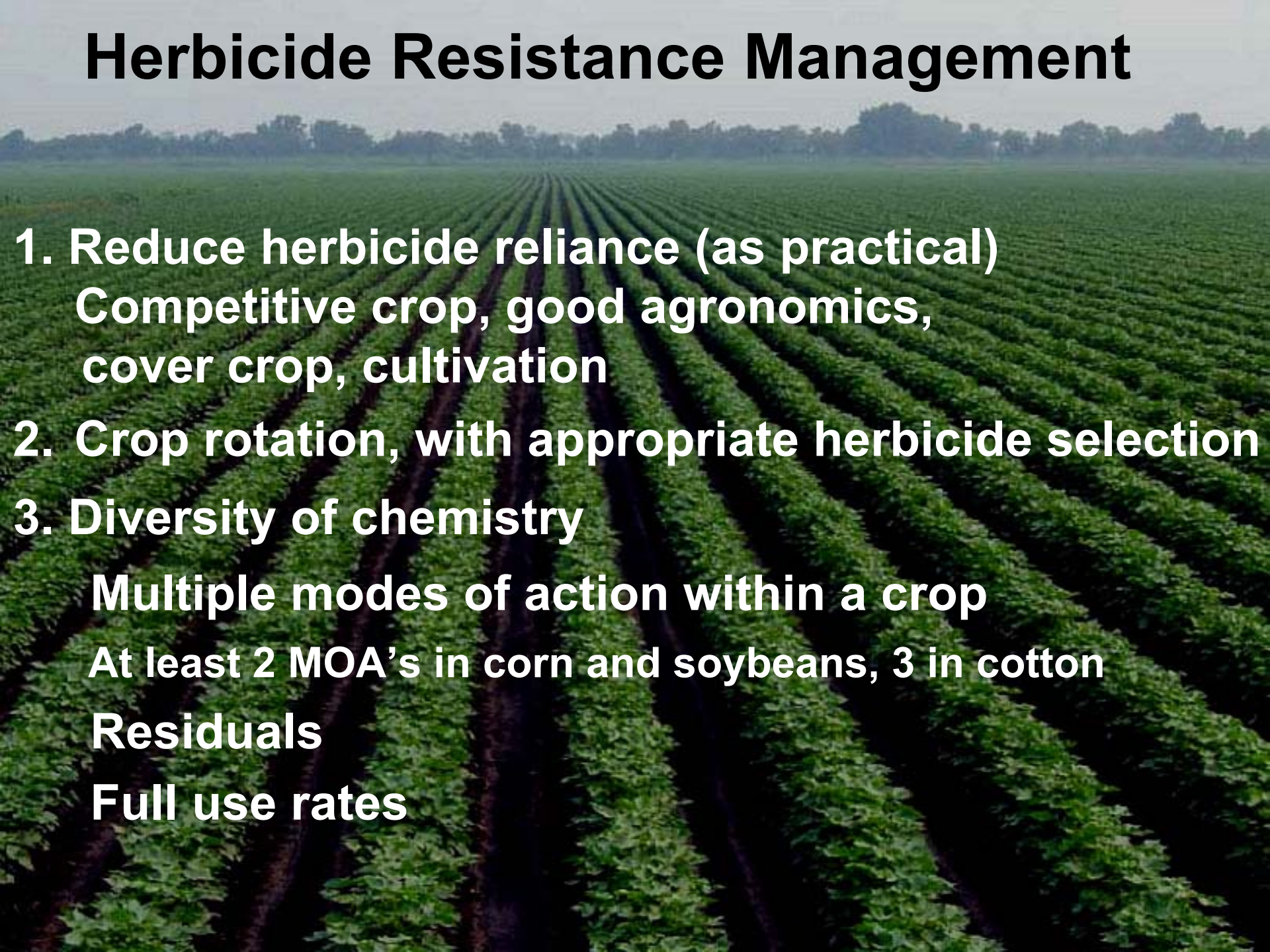


Weathermax

88 oz.

Staple LX 10oz

Herbicide Resistance Management

- 
- 1. Reduce herbicide reliance (as practical)**
Competitive crop, good agronomics, cover crop, cultivation
 - 2. Crop rotation, with appropriate herbicide selection**
 - 3. Diversity of chemistry**
Multiple modes of action within a crop
At least 2 MOA's in corn and soybeans, 3 in cotton
Residuals
Full use rates

Palmer Amaranth Resistance Management

- Reduce the seedbank
- Residual control is important
- Need to protect ALS inhibitors



Recommended Southeastern US herbicide programs for Palmer amaranth control in RR cotton

Glyph. resist.	ALS resist.	Preplant or Preemergence	Postemergence 1- to 4-leaf	Layby (Palmer < 3")
Yes	No	Reflex* + Direx, Reflex* + Prowl, Direx + Staple**, or Valor SX***	No Palmer emerged: Glyph. + Dual Mag. or Sequence	Valor, Suprend, Direx, or Layby Pro plus MSMA or glyphosate
			Palmer < 2 inches: Glyph. + Staple**	

* Caution if Valor preplant.

** Limit to one application per year.

*** Valor preplant only. Can follow with Direx, Cotoran, or Prowl preemergence.

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No	Yes	Staple* , Reflex**, Valor SX***, Direx, Cotoran, or Prowl	Light infestation: Glyphosate	Valor, Suprend, Direx, or Layby Pro plus MSMA or glyphosate
			Heavy infestation: Glyph. + Dual Mag. or Sequence	

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GLYPHOSATE-RESISTANT HORSEWEED

Preferred Burndown Options

Cotton or Soybean

1. Glyphosate + ½ pt. Clarity + 1 to 2 oz. Valor SX, mid-March
2. Glyphosate + 1.5 to 2 pts. 2,4-D + 1 to 2 ozs. Valor SX, mid-March



Clarity or 2,4-D kills emerged horseweed, Valor gives residual of horseweed after burn down

Is this weed resistant?
Wanna risk it?



Detect Resistance Early



If planting corn was an option, that has been

our best line of defense where glypho-

resistant Pigweed was suspected.

- Also, with *Roundup* corn, always utilized
Atrazine, often with *Dual* or *Lasso* to start
clean.

- Soybeans have used mostly glyphosate-based programs, but often include *1st Rate* and other materials as needed.
- Need to re-evaluate soybean programs to include Pre's.

- Wheat ALS inhibitor reliance makes us stay
way from the use of ALS inhibitors with
double cropped soybeans.

Now

- Current commodity prices provide options to rotate crops and chemistry;
- Resistant weeds-such as Pigweed, Horseweed are creeping in;
- Have to be more diligent than ever (in spite of *Flex* cotton); and
- Need to do in-season identification and full weed surveys.

As consultants our job is less
about
managing disasters than
preventing them.

“I learned that a great leader is a man who has the ability to get other people to do what they don't want to do and like it.”

Harry S. Truman

Consultants Responsibility

- Consultants make a living out of telling people what they don't want to hear.
- Our responsibility is to find a palatable way to do this.



“OK, you know the routine!”

In 1983, a legendary consultant came to NC and put on a seminar as many of the consultants were getting started.

Dick Jensen's explanation of roles:

- 1) Research – develops
- 2) Extension – demonstrates
- 3) Consultants - implement

- I'd add to Dr. Jensen's list and say that suppliers both at the local/distributor and manufacturing level have always played a vital role in information transfer, as well as simply supplying products. That role is as vital as ever.

Research and *Extension* is doing an excellent job of developing management solutions and demonstrating the complexity of these issues.

Up to us, consultants, to use our influence and credibility with growers to implement strategies focused on pre-empting serious problems.

Survey

Dr. Kenneth Smith in Arkansas reported that 90% of the growers in North Carolina and Mississippi are aware of resistance problems but 30% are still using only *glyphosate*.

The community suffers when individuals act in self interest.

“Tragedy of Commons”, Garrett Hardin

Consultants, Extension, and our
Supplier Network have to support
each other;

Reinforce the message.

A focus on profitability and long-term success requires a proactive approach.

Managing Full-blown resistance—expensive

Pre-'s important, but not always effective,
especially under dryland conditions

Critical to stay ahead of serious problems if
possible

Summary

- Act as if problem exists before it develops
 - Multiple modes of action, early treatment, etc.;
- Do a thorough job of weed surveys, recordkeeping;
- Help grower plan;
- Talk it up, get others involved – constantly;
- Try to keep growers with problems out of your neighborhood.

LOUISIANA

- Leader in resistance management with insect problems.
- Will need to apply sample principles, same outreach and influence in the future with weed management issues as they develop.

Louisiana consultants provide the gold standard for involvement on policy and political issues, maintaining good relationships throughout the ag community, and supporting continuous education.

- Organizations such as *LACA*, *NAICC* have never been more crucial to our educational development and that of our producers;

-Information dissemination and knowledge transfer, relationships, access to technology, collective wisdom.

- Internet is a wonderful tool but when I

Keys to Managing Resistance

- Are the same as keys to a vibrant future for production agriculture:
 - Education, life-long learning
 - Focus on “Systems Thinking” and
 - Information/Technology transfer.

Education

- Keep hammering – keep message out there;
- Take growers to *Extension* demo sites;
- Show pictures in grower meetings; and
- Whatever methods work with your problems.

Support Consulting Organizations

- Future of production agriculture, scholarship programs, applied educational programs at all levels, including *Doctor of Plant Medicine*, and traditional programs at your local universities.

- Stay educated:
 - Local *Extension*
 - Other Consultants,
 - *National Cotton Council's* website
 - *NAICC*
 - State consultant associations

Four Basic Human Needs

- To Live,
- To Love,
- To Learn,
- To Leave a Legacy.

Stephen Covey

Challenge

- Regardless of age, work on “legacy” harder;
 - Financial support for scholarships to *LSU*, *LA Tech*, etc.
 - *NAICC*’s educational outreach efforts through *FEAE*, which supports workshops, Dick Jensen scholarships, *Dr. of Plant Medicine* program, etc.

Other Pieces of Legacy

- Work at developing relationships with other consultants;
- Share information to make each other better;
- Teach others about agriculture; and
- Volunteer in schools, churches, civic clubs, etc.

“Pay It Forward”

It is our responsibility to give back to the industry that supports us and has always played a vibrant role in making our nation great.

Benefits > Investment

- When you invest in your own education by participating in organizations such as NAICC, over time, your benefits exceed the investment many times over

Can you afford not to do your best
on resistance management?



Soybeans planted here, glyphosate applied 3 times.

