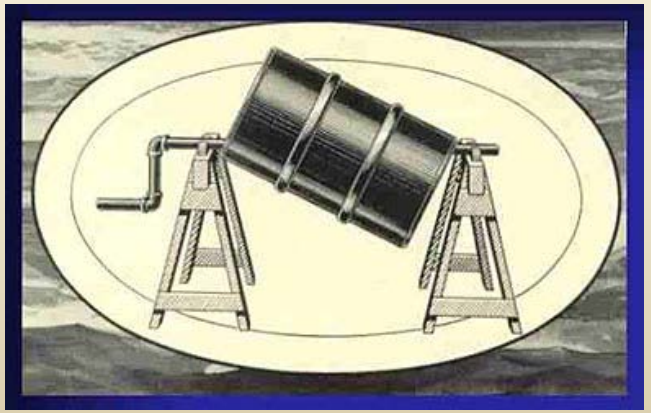
Seed Treatment of Southern Pines: Past, Present & Future Options

Tom Starkey

November 2013



Michigan State University Extension. 2002. Chemical Treatment of Agronomic Seeds. Ext Bull E-2035. 19p
http://fieldcrop.msu.edu/uploads/documents/E2035.pdf

- Seed treating includes anything done to the seeds between harvest and planting to protect or enhance the vigor and productivity of the seed.
- Seed treatment chemicals include insecticides, fungicides, bactericides, repellents, fertilizers, and adjuvants

Michigan State University Extension. 2002. Chemical Treatment of Agronomic Seeds. Ext Bull E-2035. 19p

- Fungicides used -Systemic and nonsystemic
  - Systemic pose the greatest risk factor since the chemical stays in the plant after germinating
- Thiram – fungicide or repellant?
- Adjuvants – compounds that are used to aid in the retention of the pesticide or lubricate seed for planting

Michigan State University Extension. 2002. Chemical Treatment of Agronomic Seeds. Ext Bull E-2035. 19p

- All food/feed crops are required to contain a contrasting colored dye.
- Seed treatment pesticides are usually sold as special formulations intended solely for use as seed treatments.
  - Adjuvants used in these formulation are formulated treating and sticking to seeds

Michigan State University Extension. 2002. Chemical Treatment of Agronomic Seeds. Ext Bull E-2035. 19p

- Seed treatment formulations:
  - Wettable powders – not best choice, often lack sticking ability
  - Slurries – flowable preparations of chemical pesticides
    - Constant agitation is important
    - Provide excellent seed coverage and low chemical volumes

Michigan State University Extension. 2002. Chemical Treatment of Agronomic Seeds. Ext Bull E-2035. 19p

- Seed treatment formulations:
  - Dust = chemical + sticker = excellent choice
  - Liquid formulations – form true solutions in a compatible solvent. Can effectively be applied in minute amounts in modern seed treatment machinery

Michigan State University Extension. 2002. Chemical Treatment of Agronomic Seeds. Ext Bull E-2035. 19p

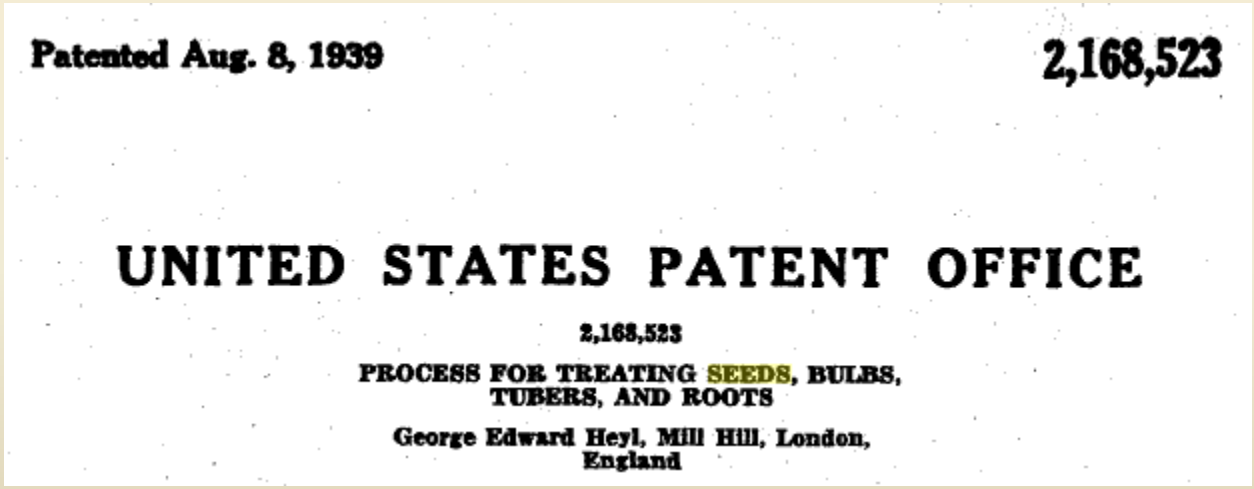
- How to treat small seed lots (cement mixer)
  - Care must be taken that the chemical once applied is not lost before planting.
  - Safety of seed treating personnel and seed handlers must be assured.
  - Mixing device should be no more than 1/3 full
  - Advisable to convert amounts needed to metric units

Michigan State University Extension. 2002. Chemical Treatment of Agronomic Seeds. Ext Bull E-2035. 19p

- How to treat small seed lots (cement mixer)
  - Seeds differ in absorbency. Smooth seed require less total water to wet than non-smooth seed
  - Shaking seeds at this stage can injure them
  - Chemicals are lost on the surface of the mixer. 5-10% extra chemical should be added for loss
  - Adhesion of chemical to very smooth seed can be improved by the use of a spreader sticker.

Latex in Nurseries

- **Dow Latex** 512-R (512-L, 630, 636, 2028) – diluted 1:9 with water



Patented Aug. 8, 1939 2,168,523

UNITED STATES PATENT OFFICE

2,168,523

PROCESS FOR TREATING SEEDS, BULBS, TUBERS, AND ROOTS

George Edward Heyl, Mill Hill, London, England

Current use of latex

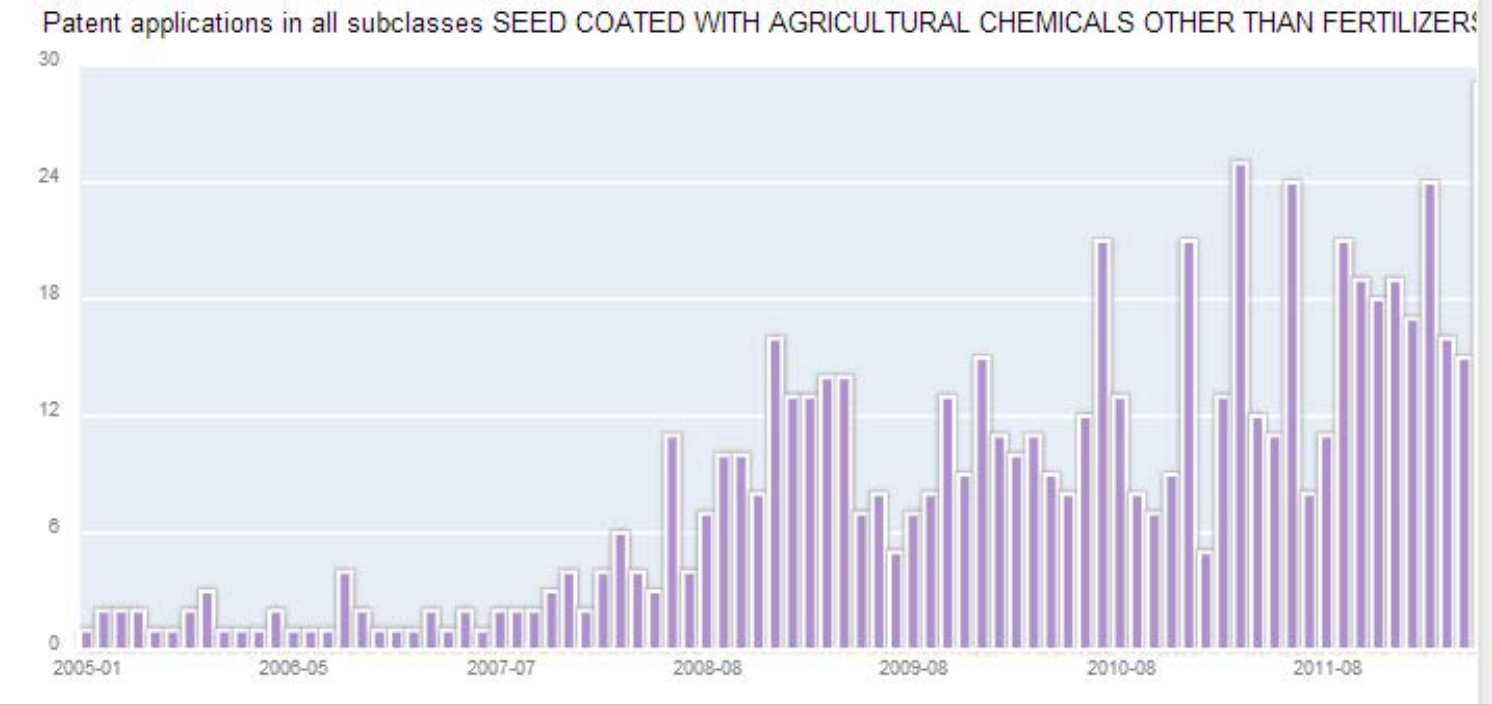
- >80% of all nurseries use latex
  - ~ 1/2 buy latex from local paint store
  - ~1/2 use Dow latex
    - "Still using latex I bought > 15+ years ago"
    - "Twisted arm and bought some from another nursery"
    - "Not an easy task to buy from DOW, especially small quantities."
    - "DOW sent small quantity free"

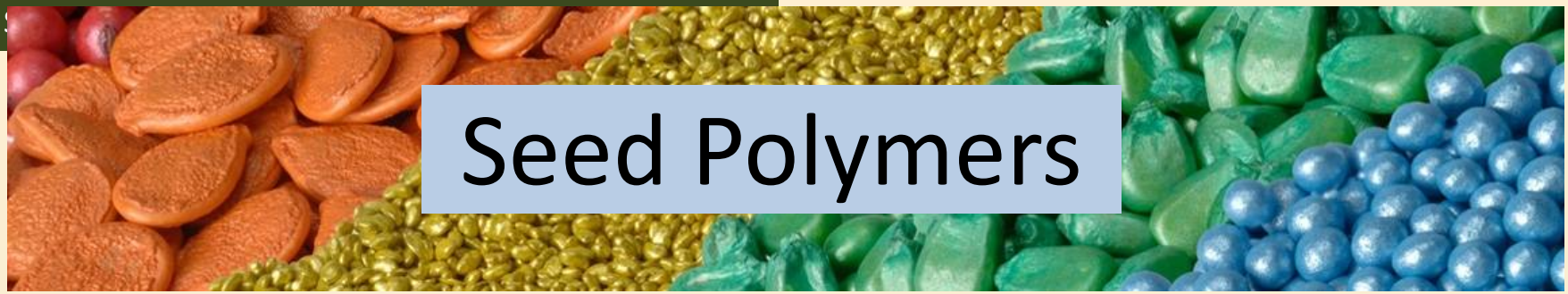
Current use of latex

- Some concerns:
  - Finding latex – at least DOW latex
  - What is a good latex?
  - Clumping of seed after drying
  - Worker Protection concerns - “dust off” during sowing

Seed Polymers

- Last 5-10 years enormous amount of research on seed treatment





Seed Polymers

- Last 5-10 years enormous amount of research on seed treatment
- Ability to protect seed treatments
- To reduce “dust-off” concerns (an EPA concern)
- To enhance plantability
- Desire to enhance seed appearance & ID

Seed Polymers

- “Seed polymers are a bit like force fields: You cannot always see them, but they are there to protect.”
- To protect the growing number of pesticides and biologicals being applied to the seed.
- Provides uniform coverage of other seed treatments

Seed Polymers

- Polymers can help reduce the possibility of skips and doubles when planting – no clumping or stickiness. Increases seed drop accuracy
- Compatible with major fungicides, insecticides, inoculants and colorants

Seed Polymer

BECKER UNDERWOOD
Inventing the Future
Now part of BASF

CF CLEAR

HOME » PRODUCTS/SERVICES » SEED COATINGS » POLYMERS

Polymer seed conditioner film

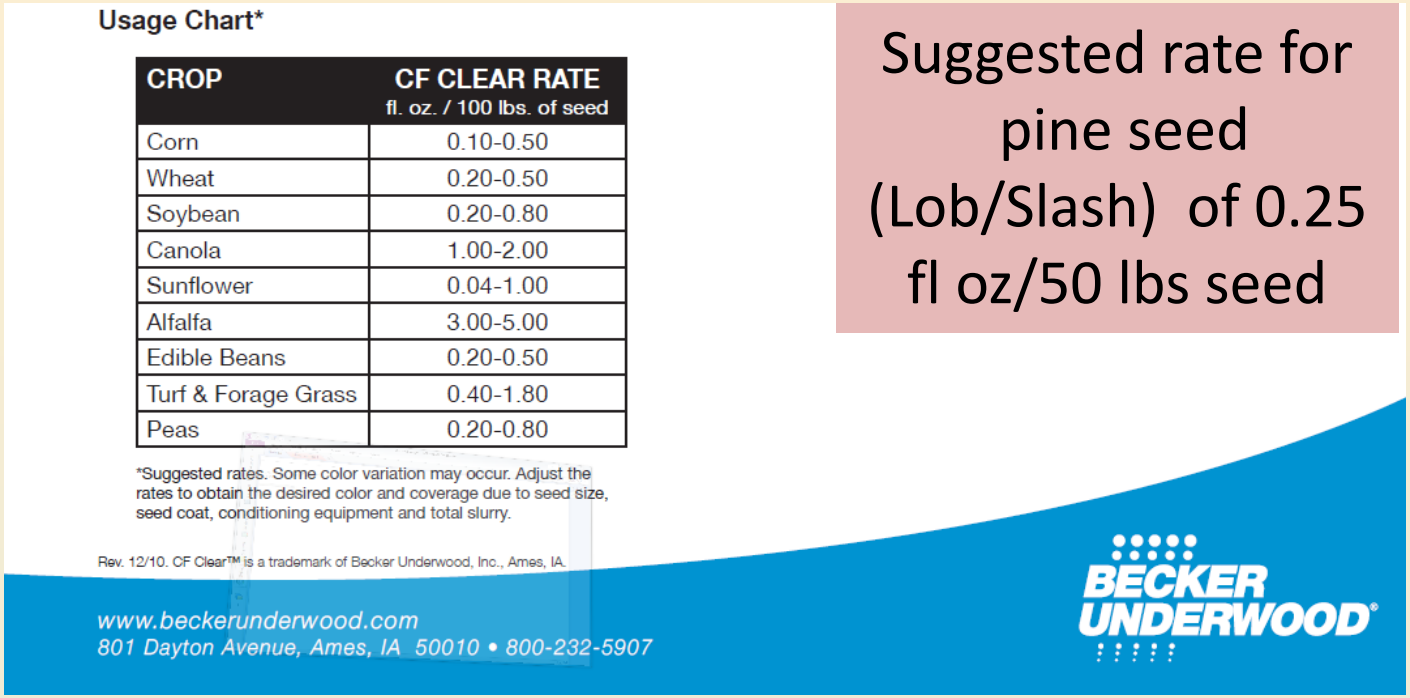
CF Clear is a water-based, low-viscosity polymer that keeps actives on the seed, controls dust-off, improves application coverage, plantability, seed flow in seed facilities, seed performance, seed appearance and seed build up, all with easy clean up.

CF Clear gives you . . .

- Strong bond for active onto seed
- Reduced dust-off
- Improved plantability and seed flow
- Easy clean-up
- Low viscosity
- Water based

Packaging: 4x1 gallons (36 per pallet), 2x2.5 gallons (36 per pallet), 30 gallons (5 per pallet), and 260 gallons (1 per pallet).

CF Clear – Becker Underwood



Usage Chart*

CROP	CF CLEAR RATE fl. oz. / 100 lbs. of seed
Corn	0.10-0.50
Wheat	0.20-0.50
Soybean	0.20-0.80
Canola	1.00-2.00
Sunflower	0.04-1.00
Alfalfa	3.00-5.00
Edible Beans	0.20-0.50
Turf & Forage Grass	0.40-1.80
Peas	0.20-0.80

*Suggested rates. Some color variation may occur. Adjust the rates to obtain the desired color and coverage due to seed size, seed coat, conditioning equipment and total slurry.

Rev. 12/10. CF Clear™ is a trademark of Becker Underwood, Inc., Ames, IA.

www.beckerunderwood.com
801 Dayton Avenue, Ames, IA 50010 • 800-232-5907

BECKER UNDERWOOD

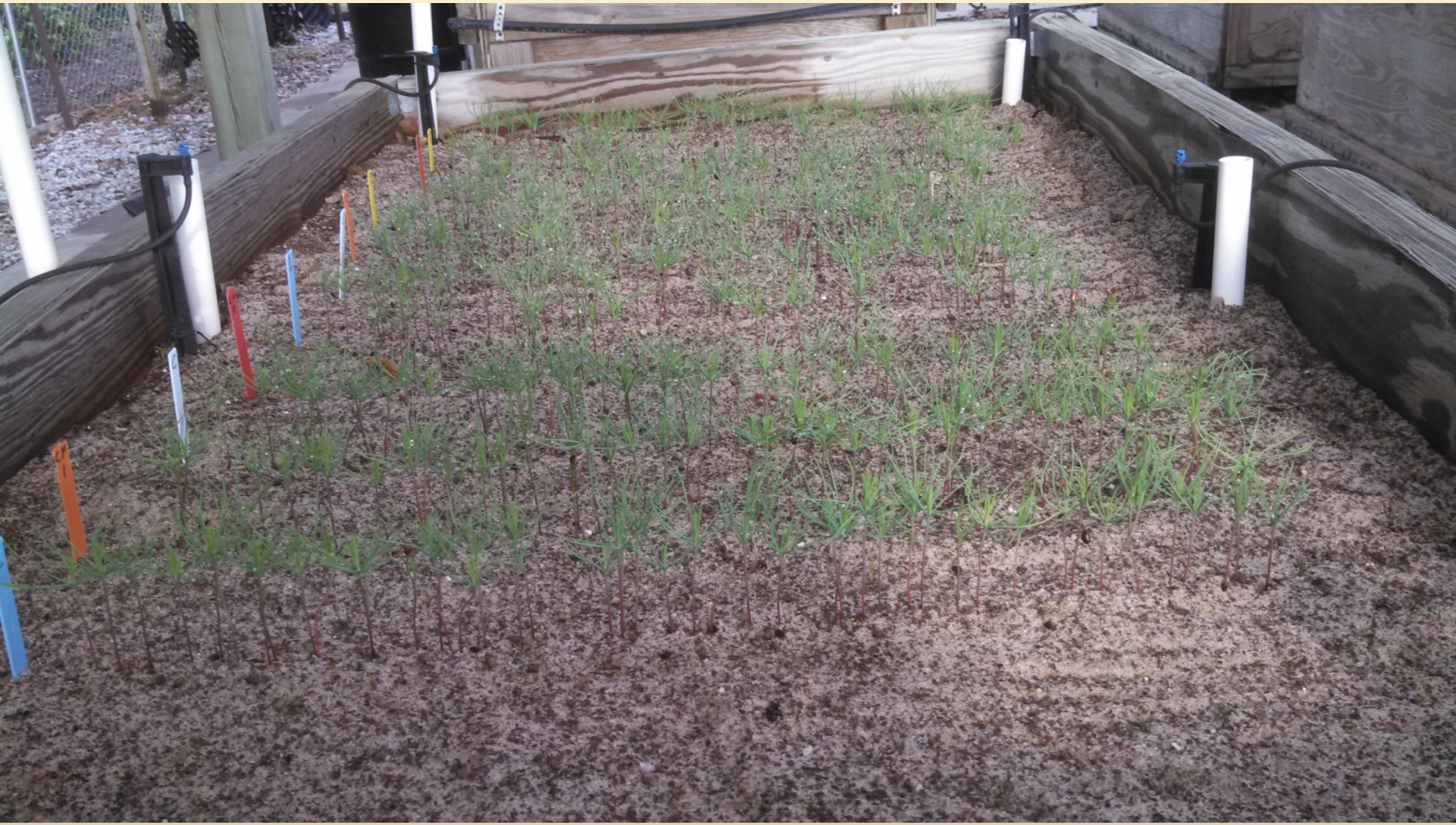
Suggested rate for pine seed (Lob/Slash) of 0.25 fl oz/50 lbs seed

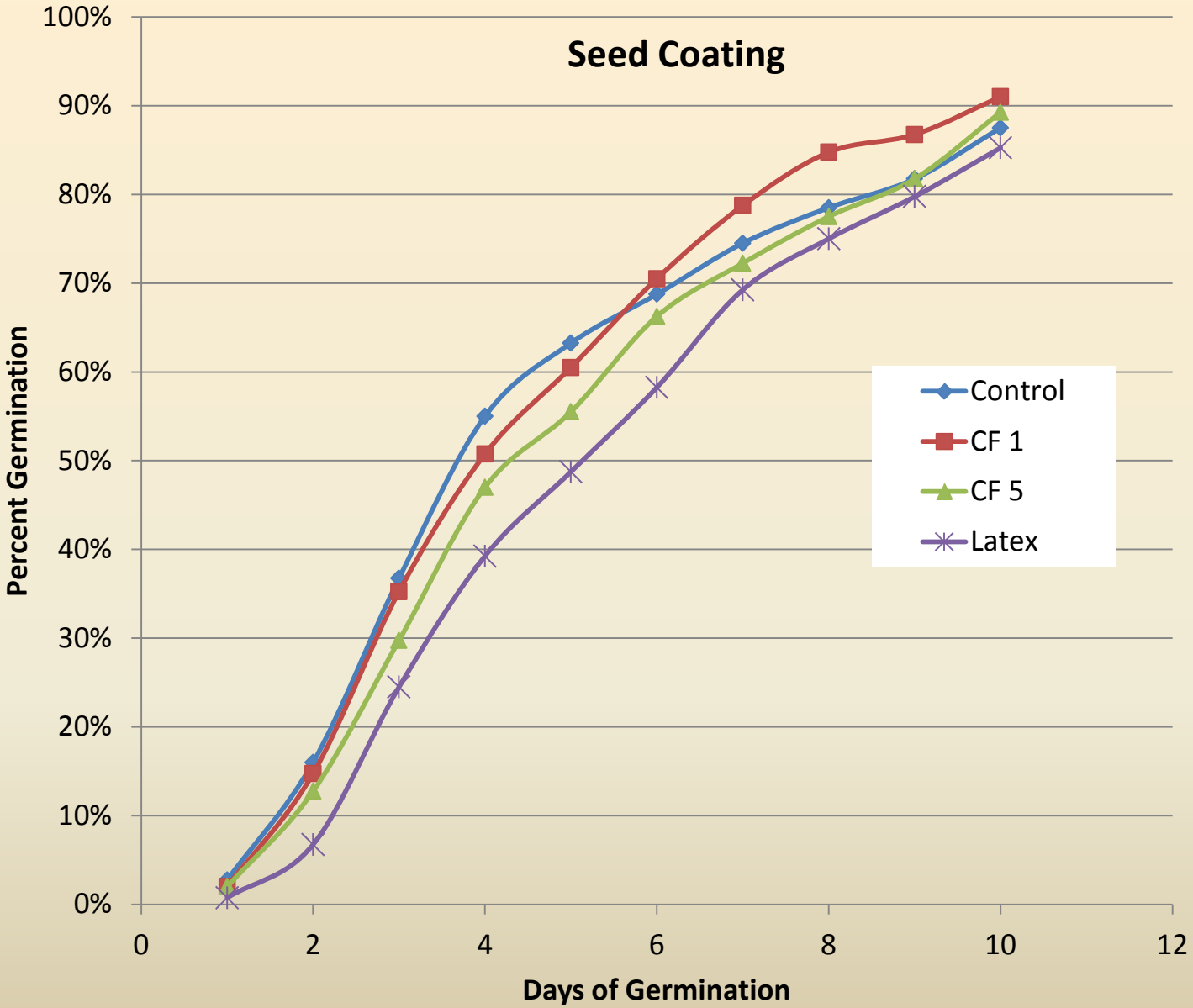
- Cost is ~ $60/gallon
- All major chemical suppliers (Helena, Greenpoint Ag, etc) can order the product.

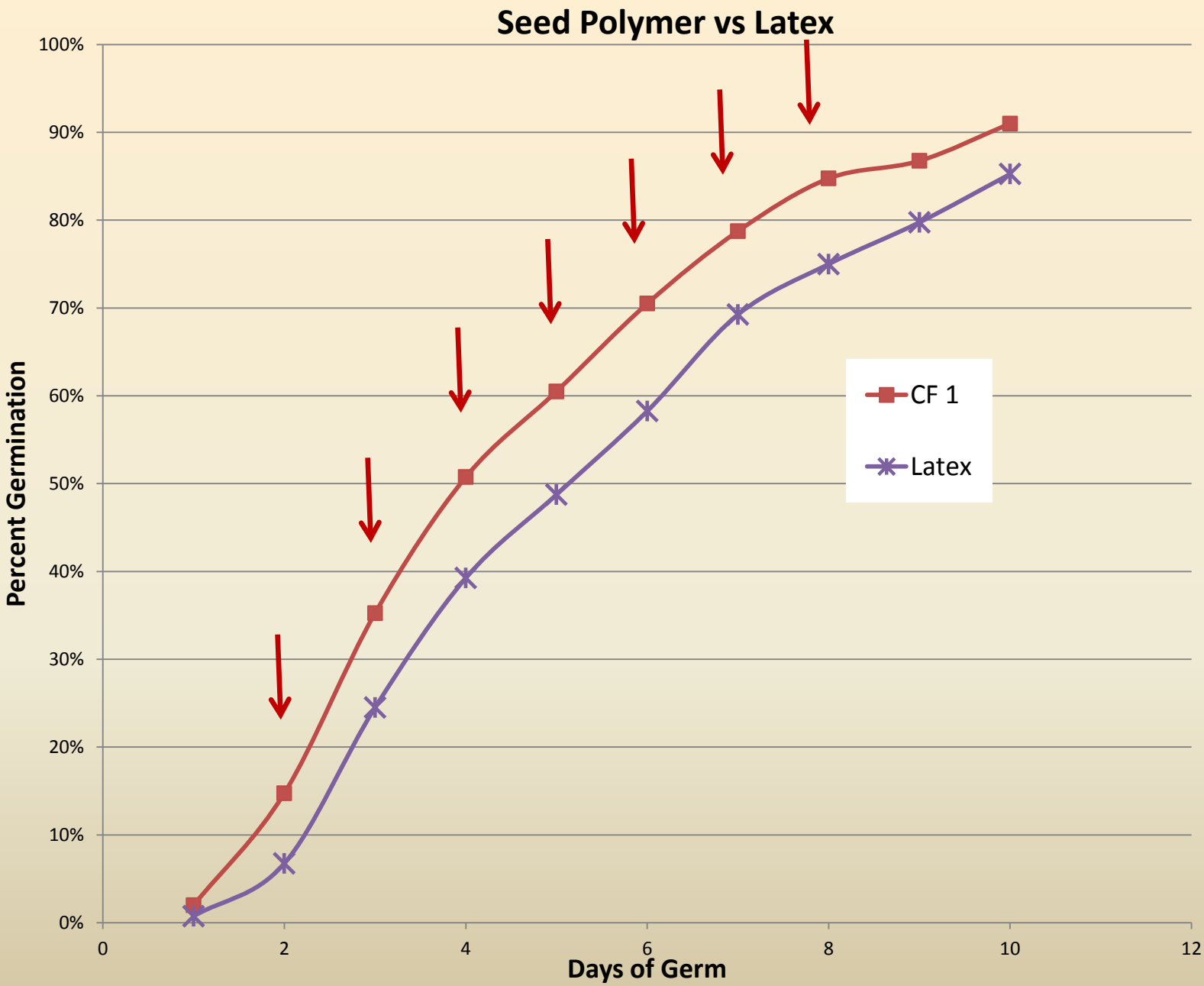
AU Initial Test

- Slash pine
- 100 seeds/treatment, 4 replications
- 12 hr soak, 40 day strat
- Treatments:
  1. No seed coating
  2. Latex - @ 1% water volume
  3. CF1 - @ recommended rate of 1% (0.25 fl oz/50 lb seed)
  4. CF5 - @ 5x recommended rate


CF
1
CF
5
L

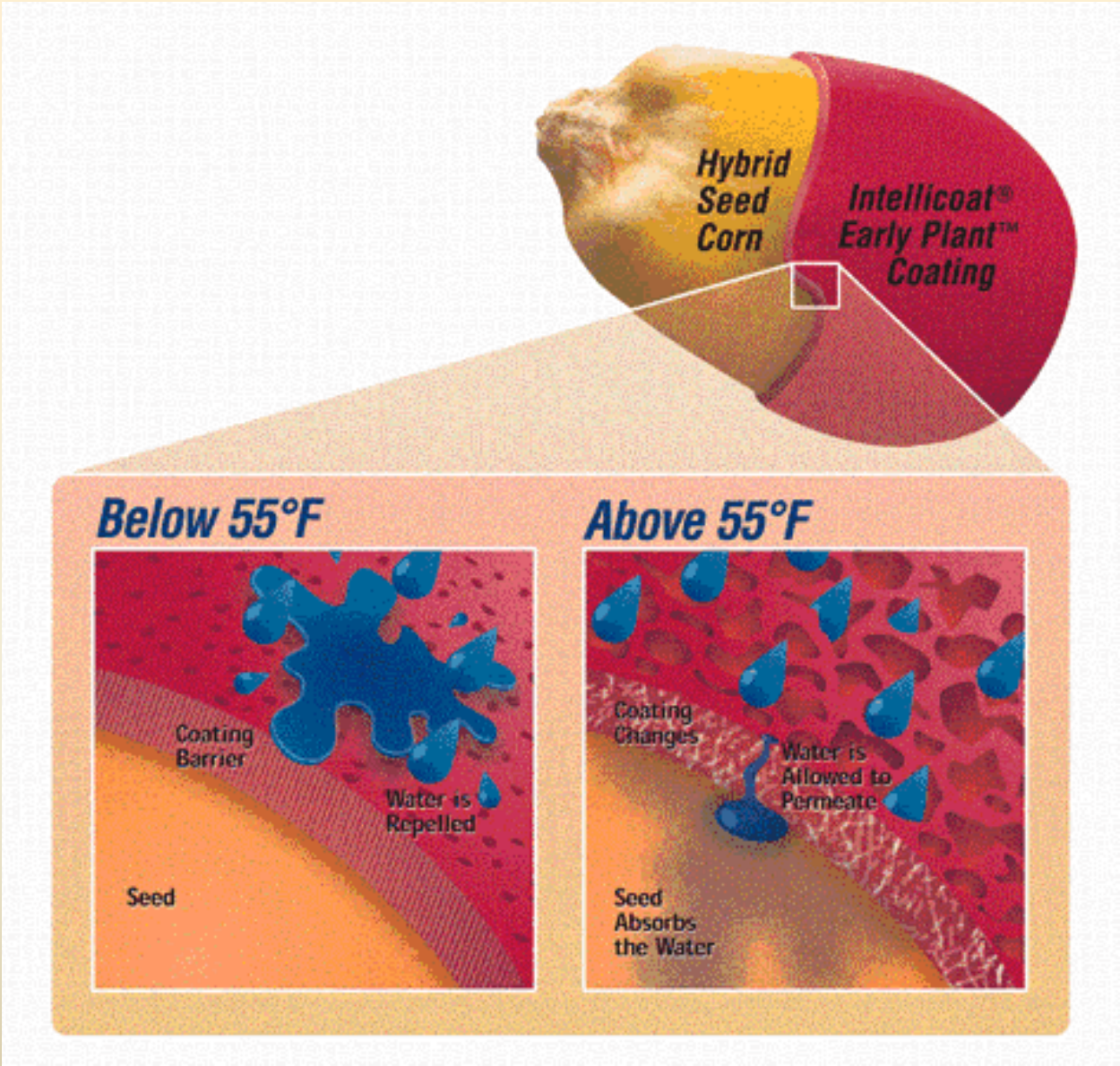



Seed Coating
Percent Germination
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
2
4
6
8
10
12
Days of Germination
Control
CF 1
CF 5
Latex


Seed Polymer vs Latex
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Percent Germination
0
2
4
6
8
10
12
Days of Germ
CF 1
Latex

HOT TOPICS in Ag

Temperature sensitive polymer coatings

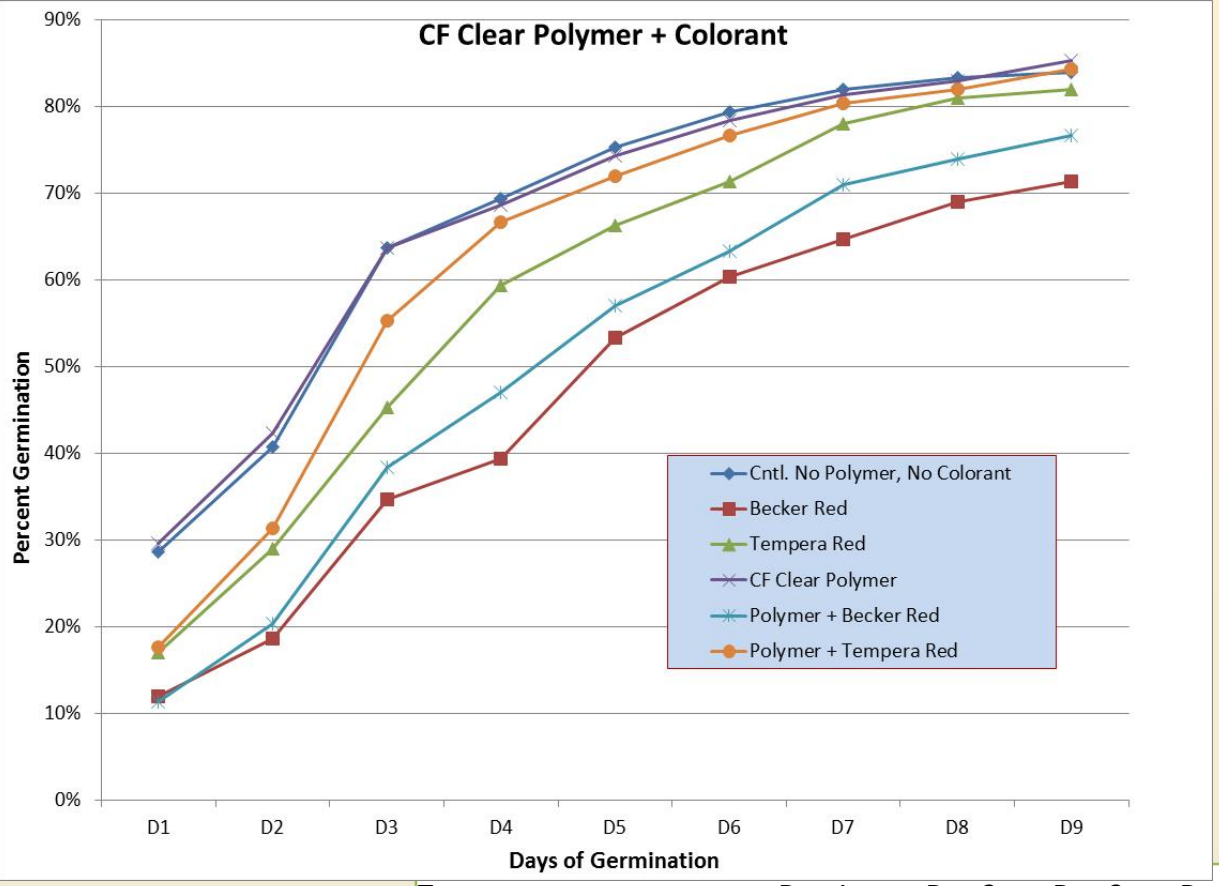


Study # 2

- CF Clear and 2 types of seed colorant on slash pine

CF Clear Plus Colorant (Becker or Tempra)

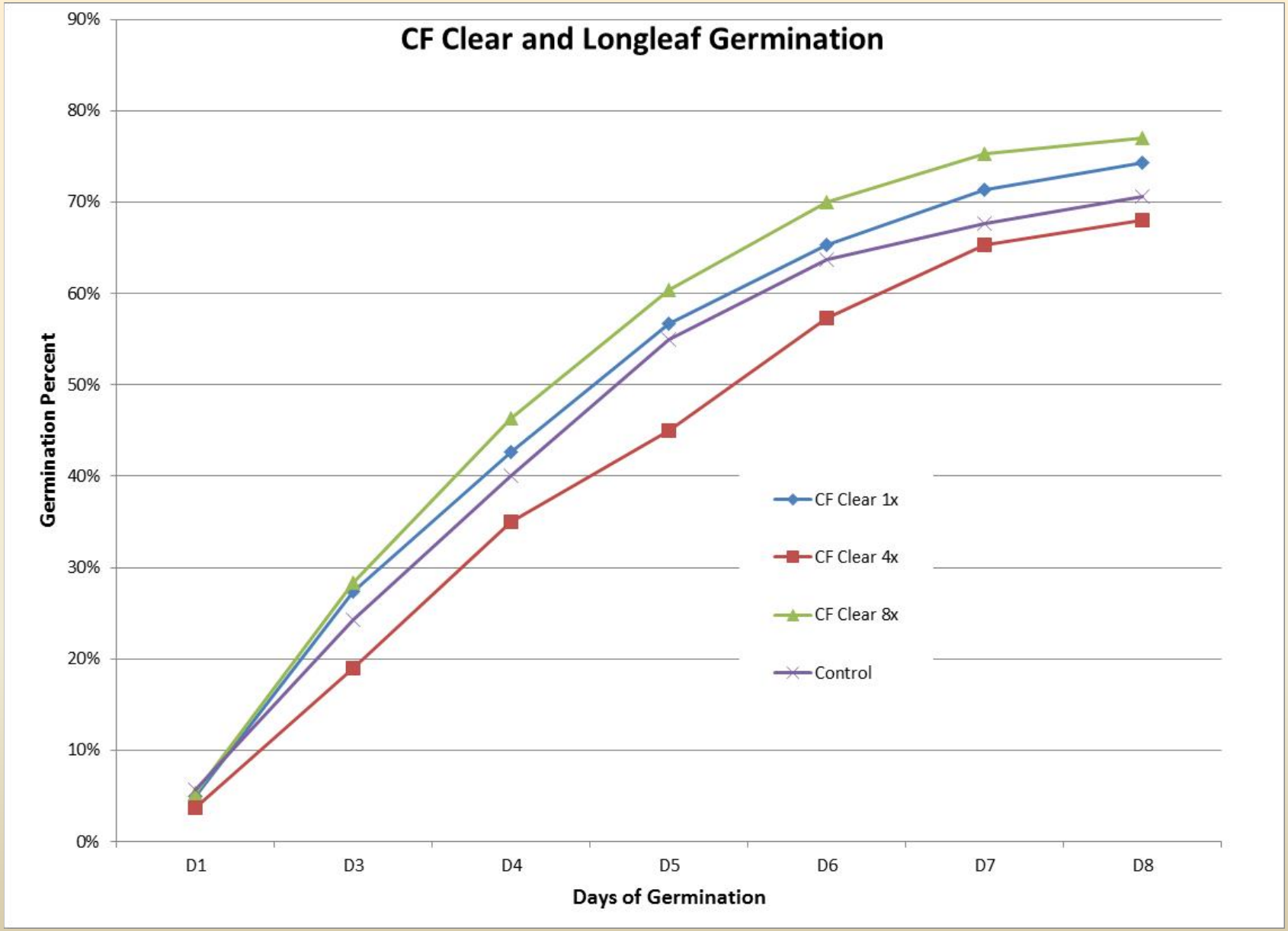
- 8 fl oz of liquid (water + chemical+ colorant) for 15 lb of seed.
- 8 fl oz (237 ml) is enough to wet seed
- Colorant – used rate of 3 fl oz/gallon of water
  = 3 fl oz/128 fl oz
  = 88 ml/3785 ml
  =~ 5.5 ml/235 ml
- CF Clear = 2.5 ml /235 ml water



Treatment	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9
CF Clear Polymer	30% A	42% A	64% A	69% A	74% A	78% A	81% A	83% A	85% A
Control	29% AB	41% A	64% A	69% A	75% A	79% A	82% A	83% A	84% A
CF Clear + Tempera Red	18% ABC	31% AB	55% AB	67% A	72% A	77% A	80% AB	82% AB	84% A
Tempera Red	17% BC	29% AB	45% AB	59% A	66% AB	71% AB	78% AB	81% AB	82% A
CF Clear + Becker Red	12% C	20% B	38% C	47% B	57% B	63% BC	71% BC	74% CB	77% AB
Becker Red	11% C	19% B	35% C	39% B	53% B	60% C	65% C	69% C	71% B
lsd 0.05	12%	14%	13%	11%	12%	9%	9%	8%	8%

Study #3

- 3 rates of CF Clear on Longleaf
  1X CF Clear
  4X CF Clear
  8X CF Clear
- Control
- Only 2 replications – no statistics run


CF Clear and Longleaf Germination
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Germination Percent
D1
D3
D4
D5
D6
D7
D8
Days of Germination
CF Clear 1x
CF Clear 4x
CF Clear 8x
Control

Summary thoughts…..

- Never assume any seed treatment will not effect seed germination. Test all additives.
- Work Plan 2014 – propose nursery studies using CF Clear
  - Bareroot -Gravity drop & precision sowers
  - Container – Vacuum drum
- Advisory caution on use of commercial seed colorants if not previously tested.