



Influence of Seed Processing and Delinting on the Degree and Uniformity of Seed-to-Seed Loading After Treatment with Gaucho and Monceren T WS

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ABSTRACT

Insecticide seed dressings like Gaucho and Monceren T WS on delinted cotton seed have to receive small doses in mg ai/seed to guarantee equal coverage for adequate protection of each young cotton plant. Bayer offers a "Quality Charter" and technical assistance to professional seed plants to reach the target of registered dose rate with Gaucho® treatment. All efforts to increase the quality of application by the seed treater can be wasted when the seed processing (delinting and sorting) is not as complete as necessary. The following graphs and tables demonstrate the influence of pre-treatment steps on the uniformity of seed-to-seed coverage of Gaucho and Monceren T WS treated cotton seeds of five origins and two different chemical delinting procedures.

Introduction

The precise treatment with Imidapocrid (Gaucho) on delinted cotton seeds depends on various parameters. After the insecticide treatment has been applied to the seed, these parameters can no longer be influenced.

Important preconditions for the precise Imidapocrid distribution from seed-to-seed are determined by seed processing prior to insecticide treatment:

- Physical seed quality.
- Quality and uniformity of the seed surface: degree of delinting per seed lot.
- Dust content of the delinted seed going into the treater.

For treatment with Imidacloprid, these factors should be optimized to reach the highest degree of loading and most uniform seed-to-seed loading:

- Imidacloprid formulation Gaucho 600 FS
- Composition and volume of the slurry
- Distribution device of the treater (batch or continuous)
- Handling behind treater and before bagging.

References

Altmanm R. (1993): Cottonseed treatment. Bayer Internal 3/93

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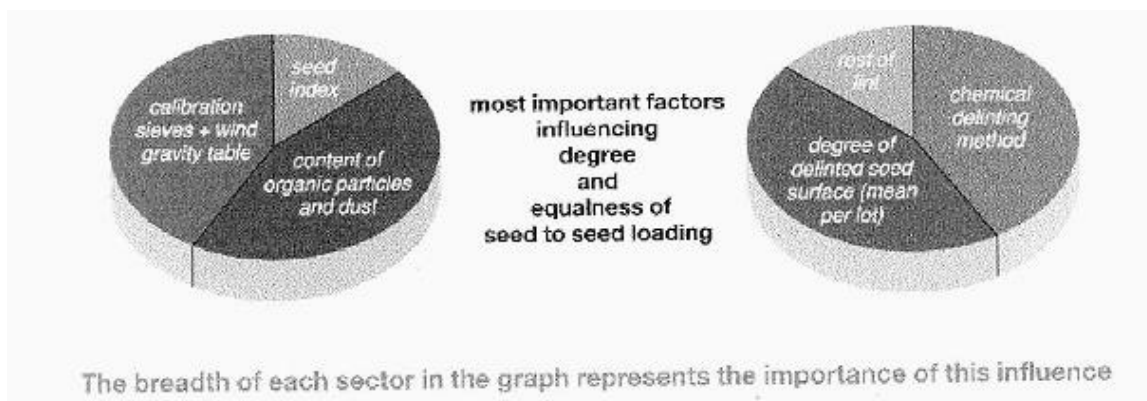
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Lafuerza, A. (1992): Baumwollsaatgut. Bayer Internal 4/92.

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Cotton seed loading of Imidacloprid in dependence of seed quality
Table: data and results of different analyses

| origin | variety | delinting method | degree of delinting | average of a.i. content (NTN) | | average of seed mass | |
|----------|----------|--------------------------------|---------------------|-------------------------------|---------|----------------------|---------|
| | | | | mg/seed | RSD [%] | mg | RSD [%] |
| Sample 1 | Aldegon | HCL-gas | > 90% | 0,35 | 22,0 | 106,7 | 19,8 |
| Sample 2 | Aldegon | HCL-gas | > 90% | 0,37 | 23,1 | 112,6 | 18,3 |
| Sample 3 | Gisa 75 | H ₂ SO ₄ | > 90% | 0,37 | 27,0 | 110,3 | 12,9 |
| Sample 4 | Nasli 84 | H ₂ SO ₄ | 60-90% | 0,41 | 48,4 | 100,6 | 17,1 |
| Sample 5 | Velonis | H ₂ SO ₄ | 60-90% | 0,38 | 51,7 | 111,8 | 18,2 |
| Sample 6 | Velonis | H ₂ SO ₄ | < 60% | 0,36 | 49,1 | 101,4 | 17,6 |

Treatment by Lab Dr. Andersch; recipe: 1 kg Gaucho & Monceren T WS/100 kg – target rate 0,35 mg a.i./seed
Analyses a.i. content and seed masses by Lab Dr. Seidel (30 x 1 seed)

Content active ingredient based on 30 x 1 single seeds

| Cotton-seeds A Zeta 2 | | | | | | | | |
|--------------------------------|----------------|-------------------|----------|----------------|-------------------|----------|----------------|-------------------|
| seed no. | seed mass [mg] | content a.i. [mg] | seed no. | seed mass [mg] | content a.i. [mg] | seed no. | seed mass [mg] | content a.i. [mg] |
| 1 | 122,2 | 0,666 | 11 | 133,8 | 0,398 | 21 | 130,9 | 0,567 |
| 2 | 112,9 | 0,596 | 12 | 131,9 | 0,842 | 22 | 134,5 | 0,427 |
| 3 | 126,9 | 0,447 | 13 | 143,3 | 0,550 | 23 | 128,0 | 0,275 |
| 4 | 135,7 | 0,579 | 14 | 76,7 | 0,486 | 24 | 105,8 | 0,417 |
| 5 | 102,2 | 0,345 | 15 | 133,0 | 0,507 | 25 | 114,9 | 0,665 |
| 6 | 121,6 | 0,374 | 16 | 126,5 | 0,405 | 26 | 111,3 | 0,369 |
| 7 | 135,3 | 0,696 | 17 | 116,7 | 0,321 | 27 | 136,7 | 0,472 |
| 8 | 119,8 | 0,867 | 18 | 105,9 | 0,466 | 28 | 117,7 | 0,599 |
| 9 | 123,1 | 0,632 | 19 | 118,9 | 0,788 | 29 | 118,2 | 0,694 |
| 10 | 137,7 | 0,402 | 20 | 142,6 | 0,548 | 30 | 124,5 | 0,506 |
| mean of seed masses [mg] | | | | 123,0 | RSD (%) | | 11,3 | |
| mean of content a.i. [mg/seed] | | | | 0,525 | RSD (%) | | 22,4 | |

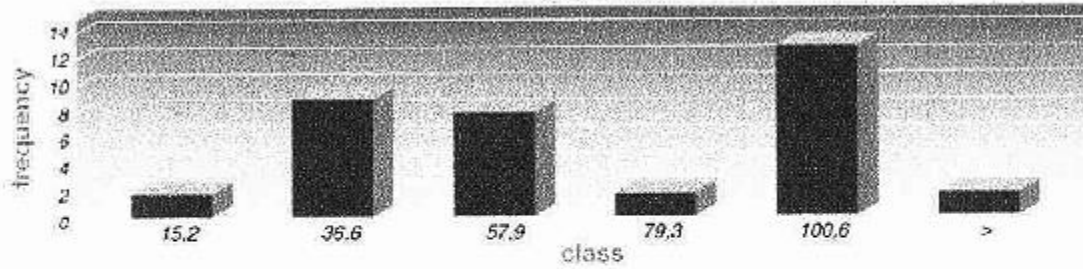
Treatment with GAUCHO 350 FS target rate 0,325 kg a.i./100 kg

| Cotton-seeds B PK 290 x 4 | | | | | | | | |
|--------------------------------|----------------|-------------------|----------|----------------|-------------------|----------|----------------|-------------------|
| seed no. | seed mass [mg] | content a.i. [mg] | seed no. | seed mass [mg] | content a.i. [mg] | seed no. | seed mass [mg] | content a.i. [mg] |
| 1 | 42,3 | 0,535 | 11 | 90,7 | 0,200 | 21 | 26,5 | 0,154 |
| 2 | 93,8 | 0,222 | 12 | 43,4 | 0,170 | 22 | 28,7 | 0,389 |
| 3 | 48,2 | 0,256 | 13 | 22,2 | 0,179 | 23 | 89,1 | 0,375 |
| 4 | 24,0 | 0,237 | 14 | 38,1 | 0,356 | 24 | 88,4 | 0,257 |
| 5 | 93,5 | 0,086 | 15 | 122,0 | 0,427 | 25 | 42,7 | 0,302 |
| 6 | 82,1 | 1,917 | 16 | 80,4 | 0,004 | 26 | 19,6 | 0,196 |
| 7 | 76,0 | 0,321 | 17 | 16,2 | 0,182 | 27 | 90,3 | 0,173 |
| 8 | 61,7 | 0,135 | 18 | 81,1 | 0,204 | 28 | 72,9 | 0,098 |
| 9 | 40,5 | 0,262 | 19 | 19,7 | 0,298 | 29 | 23,3 | 0,247 |
| 10 | 97,1 | 0,135 | 20 | 51,3 | 0,142 | 30 | 85,9 | 0,876 |
| mean of seed masses [mg] | | | | 59,7 | RSD (%) | | 53,1 | |
| mean of content a.i. [mg/seed] | | | | 0,310 | RSD (%) | | 109,7 | |

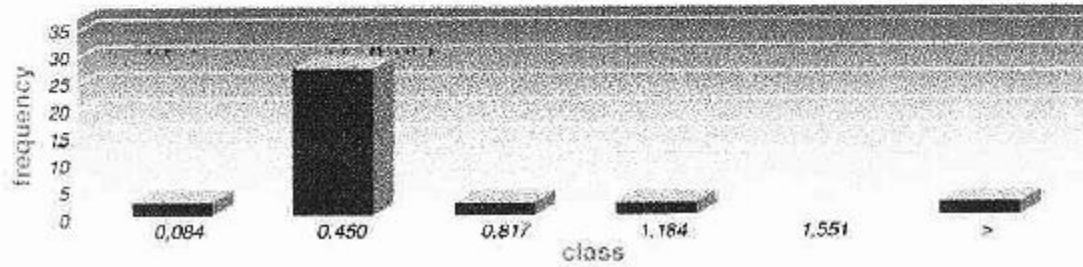
Treatment with GAUCHO T 45 WS target rate 0,35 kg a.i./100 kg

Seed masses (mg) and contents a.i. (mg IMIDACLOPRID) of 30 single seeds

Mass distribution of Cotton-seeds B
FK 290 x 4

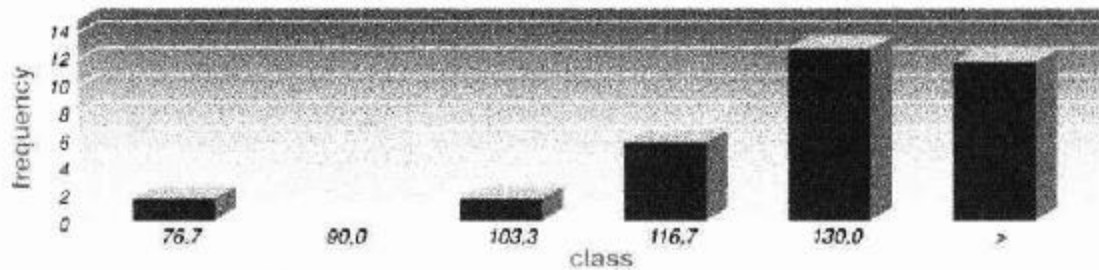


Content a.i. distribution of Cotton-seeds B
FK 290 x 4

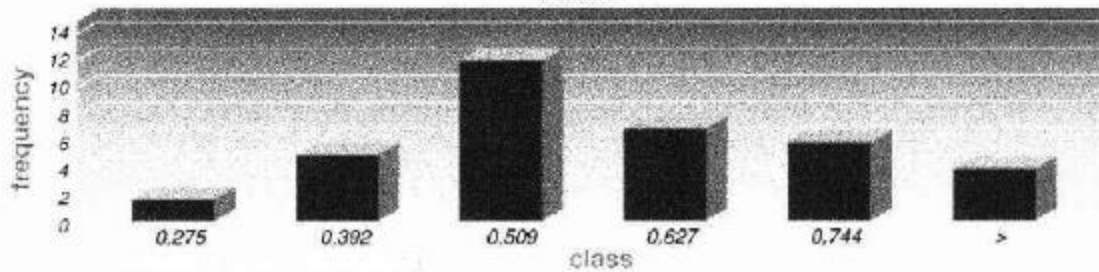


Seed masses (mg) and contents a.i. (mg IMIDACLOPRID) of 30 single seeds

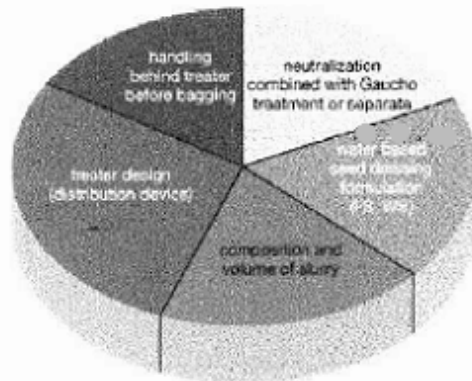
Mass distribution of Cotton-seeds A
Zeta 2



Content a.i. distribution of Cotton-seeds A
Zeta 2



Influence of treatment on degree and equalness of seed to seed loading (main factors)

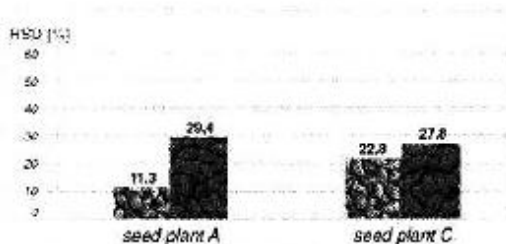
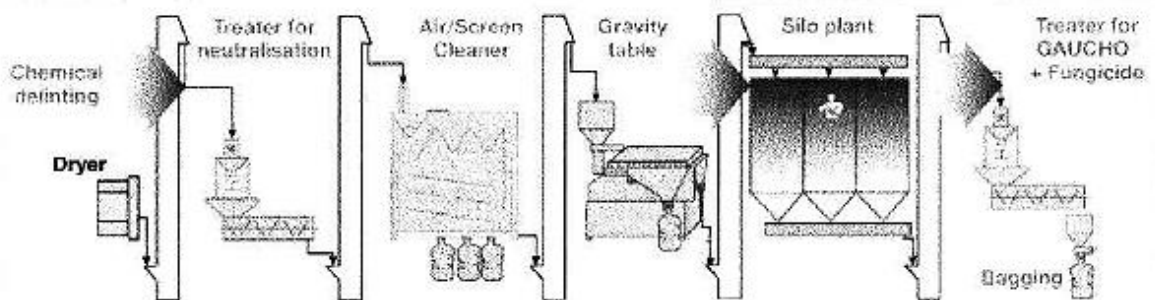


Sources of additional losses of active of the seed dressings:

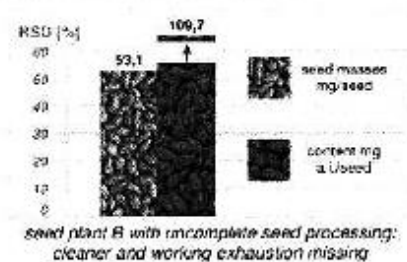
- any solid additives in the slurry or inert powders not being seed dressing active.
- thermal drying of treated seeds (depending on the drying process technology).
- dusty seed going in the treater where GAUCHO® is treated.



Influence of different seed processing after chemical delinting on standard deviation (RSD [%]) of distribution seed masses + content a.i. of 30 single seeds



both EMKAT design – see sketch above – with complete sorting + cleaning line



seed plant B with incomplete seed processing: cleaner and working exhaustion missing