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Quality Assurance, a main object of a company servicing seed processing.

ACHTUNG : Neue Telefonnr.: 05651/927-5 Neue Faxnr. : 05651/927-324 Lamprecht, Hans, and Juergen C. Knolle, SUET Saat- und Erntetechnik GmbH, Strassburger Str. 2, D-3440 Eschwege, Germany. - <u>Quality Assurance, a main object</u> of a company servicing seed processing. (ABSTRACT)

Liability on seed quality is a big question for a company, processing more than 1,000 tons p.a. in 600 lots and 370 varieties of sugar and fodder beet seed to be grown in more than 2 million acres and not owning any of the seeds. Could Insurance contracts replace a Seed Quality Management? An answer is presented by its Quality Assurance system, which is built by qualified organization, methods and regulations for thorough seed and product testing. From post-harvest processing via grading, pelleting and applying protective chemicals until the final seed product, analyses results and quality documentations are obtained before packing. The package labels decipher all reliable and traceable quality records of respective lots for legislation and customer information purposes. From each lot, depending on its size and extent of pilot processings, 14 to 50 samples are taken. More than 300 lots are tested in glasshouse by examining 500,000 individual plants on colour and bolting properties. Further 20,000 samples or 8 million seeds are examined in laboratory tests. About 35,000 chemical analyses indicate the application quality. The permanent quality controls request 16 % = 23 experted personal staff : 2 in seed processing, 4 in pelleting-coating, and 13 in quality labs attached. Additional 4 R&D experts, at 0.5-0.7 million US-\$ p.a. for beet seeds only, permanently work on material and process quality. Targets among other interests: Conditioning of seed physiology by pretreatments, controlling the efficacy of protective chemicals by technics of formulation and application, and adapting combinatory effects of suitable seed treatments with materials to soil and climate. Last but not least, with new chemicals or formulation, the methods of selective tracing the molecules have to be developed, for shelf-life and soil or plant residues. The enormous amount of samples needed for seed quality assurance can easily be enlightened by respective Binominal distribution tables : Based on only sampling deviations and no other faults, of 400 seeds analyzed ("true germination" = 90 %) only 26 % of all results will represent the true value, another 34 % indicate too high and 40 % too low values. To assure highest confidentiality of results, the number of f.i. Monogerm seeds analyzed from each lot exceeds a total amount of 15,000 grains, of which 94 independent test results for 17 different quality criteria are produced : Physical quality data as humidity, mass and size as well as purity, germination and vitality. By X-raying the seeds as a quick and non-destroying method for filling degree and monogermity, decisive results on germination quality are obtained, comparable with the longer lasting standard germination tests. Vitality tests under soil allow adaptions of pelleting components to seeds and growing conditions. Pelleted and coated for protective application, further 16,000 seed grains are analyzed to produce 126 test results for decisive 26 final product quality criteria, which concern also the mass and sizes of pellets, their mechanical and sanitary stability for perfect sowing. In view of liability, certified germination and vitality of a seed lot are considered as essential as an exact concentration of seed and plant protective chemicals applied to the lot and individual seeds. So step by step the procedures of processing are accompanied by quality analyses documentation, which enhance not only the security of fabrication quality, but also the success of the customers using the seeds. This success is granted by the company label on each packet, wherefrom any quality criteria can be detailed back from the ident number : To the seed lot, charge, day and shift of processing with respective recipes, components, humidity, drying temperatures etc etc. This Permanent Quality Control outvalues any Insurance. Money from a liability case will never satisfy the farmer, as he has still no highgrade seeds. Nor the processing company, as it will have lost its customer.

Lamprecht, Hang, and Juergen C. Knolle, SUET Saats and Estimated mile Gmbi-SEED TECHNOLOGY & MANUFACTORING 500 lots and TVI variance of sugar and fielder bert seed to be grown in more than 2 million arrest Seed Fabrication Services since 1948 d quality documentations are obtained before pa Employees 200 and a constraint of a matrix abt. 200 and a constraint of a cons to that 500 lots are rested in classiforied by examining 500,000 individ-Annual Beet Seed Fabrication : 600 Lots of Sugar Beet 250 Varieties or formulation, the of Fodder Beet 120 Varieties e Dinominal distribution tables : Rusod on only sampling deviations and no other fa with Pesticide Treatments 35 Combinations other 34 % indicate too high and 40 % too for Pelleting - Coating 2,000 Orders quality detains in motion, mass and size as well as platity, detaination and shalling Beet Seed Processed : 1,000 Tons, Pelleted and Coated : 1 Million Units (1 Unit = 100,000 Seeds) = 100 Billion Seeds surp the procedures of processing are accompanied by quality analyses docume (Sown on 2.16 ac) = 2.16 Million Acres (or 0.834 ha) = 834,000 Hectares

150101810 811 2861

ET Pesticide Combinations Homologated in Europe

SIL & FT

SUET Saut- und Erntetochnik GmbH	IT STSTEM Septerpri
Employees Seed Processing	12 (2)*
<u>Employees</u> Seed Processing	MARIHT
Pelleting-Coating	*(4) • THIRAM + 5,6 Hymexazol
Tech., Maintenance	Ioss30myH 81 + MARIHT
Research & Dev.	103612myH (4)* + MARIHT
Quality Controls	13 (13)* = 9 %
* Beet Seed Quality Management	23 = 16 %
Pilot Processings (monogerm seed	DisexmyH 7, Frankezol
(multigerm seed)) 50
Samples p. Lot (dep. Lot Size)	14 - 50 noibond o
Glasshouse, No of Lots Tested	S Iorodion 008 Hyproxecol
Individual Plants Examined	510,000 noiboral a
Laboratory, No of Tests aloched 8	Storedion 000,02 mexazol
Germination Boxes	80,000
Seeds Examined	NUMBER OF NUMBER
Chemicals Analyses	35,000 no borol d

Drains Ab ve Ingredient (). Cini = 100,000 Seeds)

SUET Saat- und Erntetechnik GmbH Pesticide Combinations Homologated in Europe

Fungicides METRY2 YT	Insecticides	Countries
12* THIRAM	30* Carbofuran	D+ Ukraine
12 THIRAM	6 Methiocarb	D, I
12 THIRAM + 5,6 Hymexazol	30 Carbofuran	Slovenia
12 THIRAM + 18 Hymexazol	30 Carbofuran	PL+D +CSR
4 THIRAM + 18 Hymexazol	40 Furathiocarb	DK
4,8 THIRAM 8,4 Hymexazol	40 Carbosulfan	S
12 THIRAM + 14 Hymexazol	6 Methiocarb	E
4 THIRAM + 14,7 Hymexazol	6 Methiocarb	* Beel Seed Qu
4 THIRAM + 14,7 Hymexazol	6 Methiocarb	NL
4 THIRAM + 14,7 Hymxazol	6 Tefluthrin	Annuality
4 THIRAM + 14,7 Hymexazol	90 Imidacloprid	Pilot BM (B ssing
1,5 Iprodion + 14 Hymexazol	4 Tefluthrin	F
1,5 Iprodion + 14 Hymexazol	12 Tefluthrin	Sample g p. Lot
1,5 Iprodion + 14 Hymexazol	3 Carbofuran 1 to	Glasshouse, No
1,5 lprodion + 5,6 Hymexazol	45 Carbofuran	Isubiviani
1,5 Iprodion + 28 Hymexazol	3 Carbofuran	Laboralqry, No
1,5 Iprodion + 28 Hymexazol	4 Tefluthrin	F Steel
1,5 Iprodion + 14 Hymexazol	90 Imidacloprid	F
Number of Combinations (or	f tot. abt. 35):	18

(* = Grams Active Ingredient p. Unit = 100,000 Seeds)



300ARU22A YTIJAUD R & D on BEET SEED



RE: QUALITY CONTROLS of Seeds (Monogerm) par Lot





QUALITY ASSURANCE

SUZET

RE : QUALITY CONTROLS of Seeds (Monogerm) par Lot

Quality Parameters	Samples	Results
20 %	ogy - Conditioning	Seed Physiol
- Grain Humidity	1 x 10 g	1
-Climate Needs	n to Individual-Soll	Adaptio
- Mass of 1,000 Grains is a lang	m1 x 5 g 9 bna .	by Mech
- Sieve Spectrum (Ø)	1 x 50 g	7
on : 40 %	ent - Plant Protecti	Seed Treatm
 X-Ray Analyses 	4 x 100 Grains	
(Filled, Empty, Bi-Germs, Twin	, Storability, Envis	61ficacy
"Filling Degree and Monogern	Molecules ar("yfin	gen resp.
	septo	- Fungie
 Purity of Non-Beet Grains 	1 x 50 g abbioi	5 Insect
	ntagonists etc.	- BIO-AI
- Germination Tests	2 x 4 x 100 Grain	าร
(Velocity 4 d, Roots > 5 mm)		8
(Vitality 4 d, Roots > 15 mm)	<u>imology</u> - Innovatio	Process Tec
(Germination 7 - 14 d, Evaluati	on	
of Anomal, Dormant, Dead Ge	n, Conditionir(em	26 lectio
	ing Material	- Pelleti
 Vitality under Soil 	2 x 5 x 100 Grain	10 OfChear
	ve ingredients etc.	HibbA -
Total No of Seeds Analysed :	abt. 15,000 Grain	ns
: to	Irance - Manageme	Duality Assu
Total No of Results Obtained :		94
zation of	v. Planning, Organi	Strategy
Quality Criteria Evaluated there	on Products, Pt 10	7130002
uations, Compilations	ds. Analyses, Eval	- Metho
formation - Certification	al and Customer in	- Intern

82





RE : QUALITY CONTROLS of Pellets (Monogerm) par Lot

Quality Parameters	Samples	Results
- Grain Humidity	1 x 20 g	
- Mass of 1,000 Grains	2 x 500 Grains	2
- Sieve Spectrum (Ø, #)	2 x 50 g	14 snimoni8
- Hardness - Stability	of g 001 x P ⁹ on Results % 98	1 Germinati
- Germination Tests (Velocity 4 d, Roots > 5 mm) (Vitality 4 d, Roots > 15 mm) (Germination 7 - 14 d, Evaluati	2 x 4 x 100 Grains	8 4
of Anormal, Dormant, Dead G	erms)	32
Vitality under Soil 0.0	² 2 x 5 x 100 Grains	10
TLC Pesticides Analysis (Thin Layer Chromatography)	2 x 100 Grains	54
12.1 4.8	88	1
Total No of Pellets Analysed :	abt. 16,000	
Total No of Results Obtained :	85	126

result > 80 %, turner 39.4 % will result < 90 %, and only 25.2 % of all tests will result in theTrue Germination (the table is built on inevitable deviations of sampling only, no other faults !).



QUALITY ASSURANCE



RE : QUALITY CONTROLS of Pellets (Monogerm) par Lot ? sol req ATAD YNAM OS YHW : 3R

Binominal Distribution of Gemination Results, for n = 400 Seeds and Different True Germinations

			-	
2 x 500 Grains 2		True Germination p (%) 94 90 85		
14	2 x 50 g	(#	ectrum (Ø,	Sleve Spe
Binomina	al Distribution 100			
1	ee x 100 g fo		- Stability	Hardness
Germinat	tion Results % 98	0.1	formation	and det that that t
	79 y 4 y 100 Grains	1.2	atzoT noi	Cominat
	96	7.3	ion Parts	Walach
6		(mm des)	aloog bi	(NEIGHIN)
	95	22.6	U. NOUS	 viiisiiv)
00	94	32.1	0.5	รถแกาออา
20	02	22.6	2.0	110NA 10
		23.0	3.0	2247 10200
0.0	26 x 5 x 100 Grains	9.0	00.2	vitality u
	91	2.5	20.6	
	2 x 100 Grains	lysis	icides Ana	TLC Pest
54	90	(vrig.0.4ote	26.2 19V	(8 0.2
	89	0.1	21.4	1.3
	88		12.1	4.8
	000 at te87	- heevler	4.5	11.4
	86	. moofine	1.3	18.6
act	85	hosiste	0.1.0	22.5

At 90 % True Germination, 34.5 % of all germinations tests will result > 90 %, further 39.4 % will result < 90 %, and only 26.2 % of all tests will result in theTrue Germination (the table is built on <u>inevitable deviations of sampling only</u>, no other faults !).



100,000 Sugar Beet Pellets 20 - 120 g Protective Chemicals 100 (0.1%) Grains Analysed for 26 Quality Criteria from 220 Results

0.5 - 0.7 Million US-\$ in R&D p.a.

45 Years of Experience and Security



45 Years of Experience and Security

THE EFFECT OF SIMULATED HAIL AND STAND REDUCTION ON VIELD AND QUALITY OF SUGARBEETS.

G.F.STALLKNECHT, K. M. GILBERTSON, and PAM SIMPSON. Montana Stata University, Southern Agricultural Research Center, 748 RR Hwy, Huntley, MT. 59037.

NPRODUCTION: Four papers on the effects of simulated hall on augurbast production as the Munthey station wave 1. Det does of 25 your of 25 your of 1980's 200 to be a summarized as follows 200 to be a summaris to be a summarized as follows 200 t

> percent nool sucrose does not appear to surface. From a physiological stand concompensate photosynitratic rates it lest a the amount of light energy evaluable to the sublic tives. This study consists of two objects of JEC TIVES. This study consists of two objects to evaluate the effect of simulated half on up light published data in Montana.

> > MATERIALS AND METHODS

Detofiation Study.

Auf Miedersehen

beetle control at planting. The beats were planted at 3.2 inches, thinned to an average of 7.5 inches for final plant stand. The crop was inigated as water needs were required. The beets were defoliated on 6/25, 7/9, 7/27, 8/13, 8/28, 9/13. (Jafollation of 30, and 60 parcent was accomplished by hand removal of the appropriate are (Fig.1). The 100 percent defoliation was accomplished by use of a gas powened weed eater which left a