Introduction to use of EFSA DegT50 Endpoint Selector and presentation of Worked examples

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ENDPOINT SELECTOR AND WORKED EXAMPLES

Two statistical tests in guidance

	Field		Laboratory
Active Substance	DegT50matrix	Active Substance	DegT50 _{matrix}
	DT50 (days)	Soils	DT50 (days)
Soils	at 20°C and pF2)		at 20°C and pF2)
а	59	1	112
b	41	2	134
C	<u>39</u>	d= Lab ?	124
d			86
е	75		
f	26	5	78
g	26	h?	67
Geomean	42,7	Lab	221
		Geomean	109,2
	A le fie		
	42,7	Test of H0 ir	n flow chart:

	Field
Active Substance	DegT50matrix
	DT50 (days)
Soils	at 20°C and pF2)
а	77

Test of H0 in flow chart: field DegT50s equal to lab DegT50s ?

Single field DegT50 longer than lab DegT50s ?





ENDPOINT SELECTOR AND WORKED EXAMPLES

EFSA developed user-friendly spreadsheet for testing of these hypotheses

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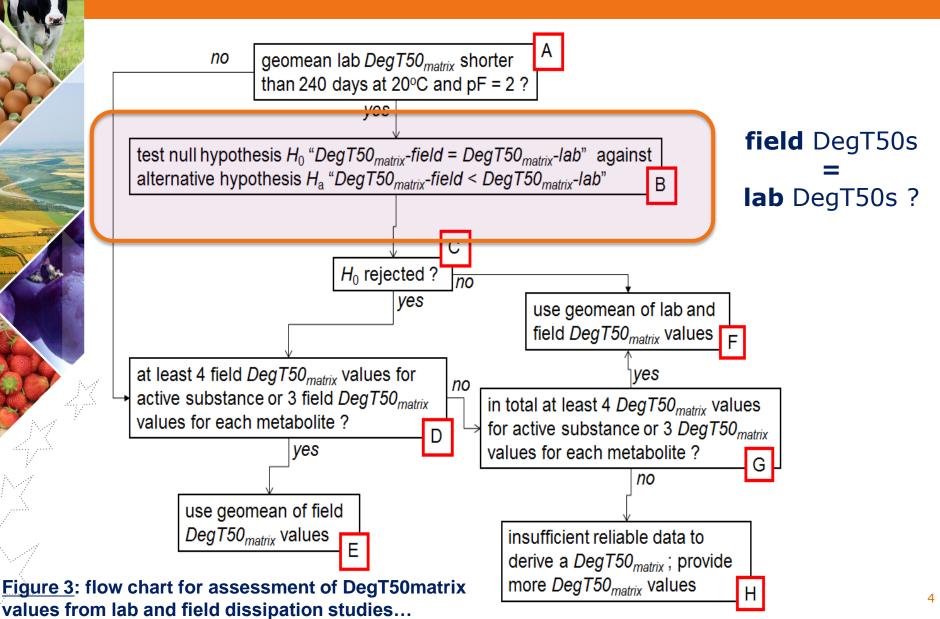
 « Geomean »: To derive geomean DT50
 « Comp LabFld »: To compare LabDeg T50 vs Field DegT50

readsheets (3)

 « Comp LabSingle »:
 To compare Lab DegT50 vs single Field DegT50



Test of H0 in flow chart: field DegT50s = lab DegT50s ?





Worked example : field DegT50s = lab DegT50s ?

test null hypothesis H_0 "DegT50_{matrix}-field = DegT50_{matrix}-lab" against alternative hypothesis H_a "DegT50_{matrix}-field < DegT50_{matrix}-lab" field DegT50s = lab DegT50s ?

Tables 2 and 3: Active substance laboratory and field *DegT50*_{matrix}

Active Substance	Laboratory DegT50 _{matrix}		Active Substance	Field DegT50 _{matrix}
Soils	DT50 (days) at 20°C and pE2		Soils	DT50 (days) at 20°C and pF2)
1	112		a	59
2	134		b	41
3	124		C	39 54
4	86	Lah	= Field?	75
5	78		f	26
6	67	· ·	g	26
7	221	1	Geomean (EFSA	
Geomean (EFSA DegT50 Endpoint Selector)	109,2	J	DegT50 Endpoint Selector)	42,7

APPENDIX E.

Worked example of faster degradation in field than in lab

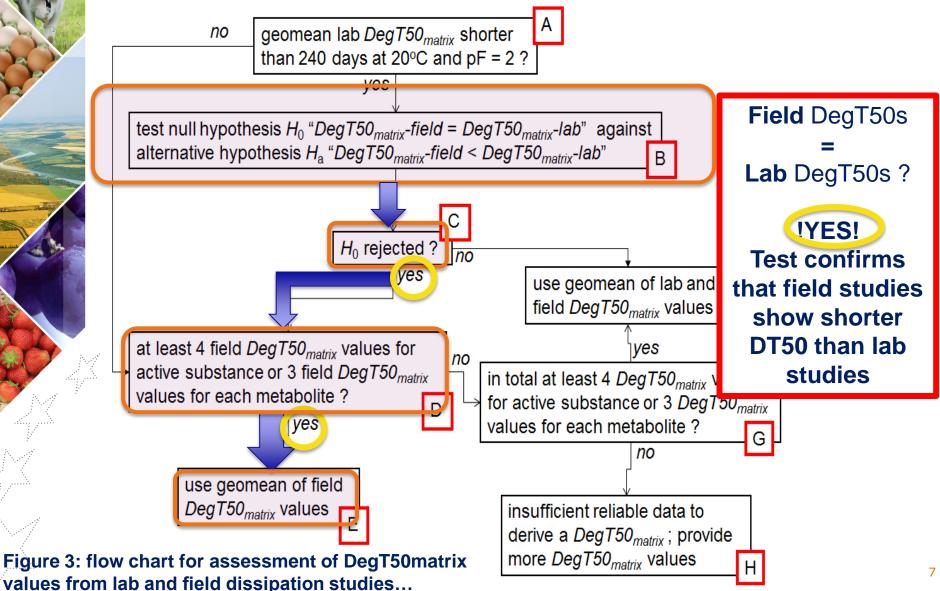


Worked example : field DegT50s = lab DegT50s ?

	Calculatio			T				boratory studies						
3 4		Co	nt. No.	Deg1	50 values		thmic 50 values		devia fuero		-	ed deviation mean μ	_	
5			i		A x _i	regr	D $\mathbf{I}_{i} = \mathbf{h}$	n(x:)=	-	from mean μ G d _i =(l _i μ _{lab})=		$\frac{\mathbf{H} \mathbf{d_i}^2}{\mathbf{H} \mathbf{d_i}^2} =$		
				v –	11	2 1 =	2 4 1	4.718			$d_1^2 =$.0007	
6		_		$\mathbf{x}_1 =$		·	_						.0420	
7				$x_2 =$	13			4.898			$d_2^2 =$			
8				x ₃ =	12			4.820	-		$d_3^2 =$.0162	
9			2	x ₄ =	8	6 <mark>1</mark> =		4.454	d ₄ =	-0.239	$d_4^2 =$	0.	.0569	
10			4	x ₅ =	7	81=		4.357	d5=	-0.336	$d_5^2 =$	0.	.1130	
11			(x ₆ =	6	71=		4.205	d ₆ =	-0.488		0.	. <mark>2384</mark>	
12				x ₇ =	22	1 _{1,=}		5.398	d ₇ =		$d_7^2 =$	0.	. <mark>4973</mark>	
13			8	x ₈ =		1 ₈ =			4 =		$d_8^2 =$			
10	39 Ca	culations	1	-		1		Field studies		1	-0			
	40		Cont. No.		DegT50 values		logarithmic			deviation		squared deviation		
	41						D gT50 value	5		from mean µ		from mean µ		
	42			j	K z	I	N	$\mathbf{k}_{\mathbf{j}} = \ln(\mathbf{x}_{\mathbf{j}}) =$		$\mathbf{Q} \mathbf{c}_{j} = (l_{j} - \mu_{fld})$	=	$\mathbf{R} \mathbf{c_j}^2 =$		
	43				$\mathbf{x}_1 =$	59	k ₁ =		4.078	c ₁ =	0.324	$c_1^2 =$	0.104	17
	44				$x_{2} =$	41	k ₂ =		3.714	c ₂ =	-0.040	c ₂ ² =	0.001	.6
e l	45				x ₃ =	39	k ₃ =		3.664	c ₃ =	-0.090		0.008	32
	46				x ₄ =	54	k ₄ =		3.989	c ₄ =	0.235	$c_4^2 =$	0.055	53
	47				x ₅ =	75	k ₅ =		4.317	c ₅ =	0.564	$c_5^2 =$	0.317	7 <mark>6</mark>
	48				x ₆ =	26	k _é =		3.258	c ₆ =	-0.496		0.245	58
	49				′ x ₇ =	26	k =		3.258	c ₇ =	-0.496	$c_7^2 =$	0.245	58
	50			8	x ₈ =		k ₈ =			c ₈ =		$c_8^2 =$		
	8	5 Signif	icance level of	f the te	st α (as given in the third of the second	ie proce	dure)					AB $\alpha =$		25
					stribution with df							AC $t_{df,1-\alpha} =$		0.695
	8	87 AD Is	Student's t-st	atistic (t larger than the t-	nuantile	t ?							
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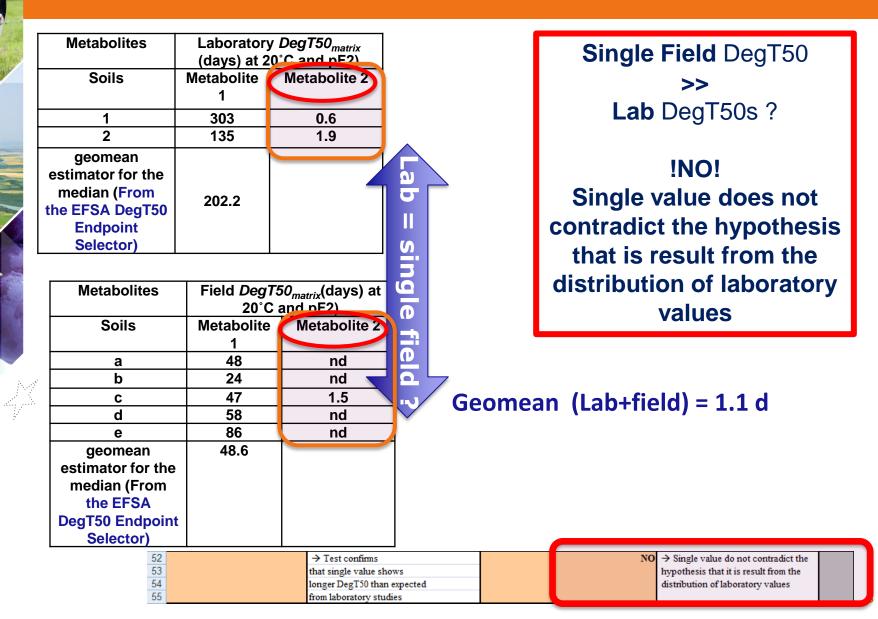


Worked example : field DegT50s = lab DegT50s ?





Worked example : Single field DegT50 >> lab DegT50s ?





DegT50 from existing (legacy) field studies : Slower degradation in field than in lab Special measures for field DegT50s that are longer than lab DegT50s

- Check whether any individual field DegT50 is significantly longer than the population of lab DegT50s (statistical test)
- Very unlikely that field study with a soil shows longer DegT50 at same temperature and moisture than a lab study with this soil
- Much more likely that a longer field DegT50 is caused by systematic errors in inverse modelling procedure

Recommendation:

Repeat inverse modelling with Arrhenius activation energy of 115 kJ/mol instead of 65 kJ/mol and with moisture exponent B of 1.5 instead of 0.7

If new field DegT50 is not anymore significantly longer than DegT50 from lab studies then discard field DegT50





Worked example : slower in degradation in field than in lab

Insecticide (Sub1), sprayed on bare soil

- Dissipation(legacy) field studies > Lab studies
- What are the possible cause of this ? »
- Sub1: Koc=41 000L/kg (high); S=0.06mg/L (Low)
- Slow degradation OR slow dissolution / slow penetration / Photochemical degradation
- Not appropriate for GW / appropriate for PECsoil
- **APPENDIX F.** Worked example of slower degradation in field than in lab





Thank you !