

Potential of green manure in the phytoremediation of the herbicide indaziflam after different times of application

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Table S1. Phytotoxicity (%) of the species of green manure, evaluated at 60 days after emergence, in different periods of sowing after application (DAA) of indaziflam at doses 0 (control), 75 and 100g a.i. ha⁻¹.

<i>Lupinus albus</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	62.00 aA	52.50 bA	70.00 aA	57.50 aA	60.00 aA
100	82.50 aA	67.50 aA	77.50 aA	72.50 aA	71.25 aA
F	A= 58.34** B= 1.33ns AxB=2.05ns				
<i>Raphanus sativus</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 cA	0.00 cA
75	100.00 aA	100.00 aA	100.00 aA	90.00 bA	90.00 bA
100	100.00 aA	100.00 aA	100.00 aA	100.00 aA	100.00 aA
F	A= 1602.67** B= 1.00ns AxB=1.00 ^{ns}				
<i>Avena strigosa</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 cA	0.00 bA	0.00 bA
75	98.75 aA	98.75 aA	90.00 bA	93.75 aA	100.00 aA
100	100.00 aA	100.00 aA	100.00 aA	100.00 aA	100.00 aA
F	A= 1694.78.67** B= 0.63ns AxB=0.63ns				
<i>Secale cereale</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	100.00 aA	100.00 aA	100.00 aA	95.75 aA	90.00 aA
100	100.00 aA	100.00 aA	100.00 aA	100.00 aA	100.00 aA
F	A= 2221.02** B= 0.92ns AxB=0.92ns				
<i>Crotalaria breviflora</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				

	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	100.00 aA	100.00 aA	100.00 aA	90.00 aA	91.25 aA
100	95.00 aA	100.00 aA	90.00 aA	100.00 aA	100.00 aA

F A= 844.01** B= 0.33ns AxB=1.10ns

Crotalaria spectabilis

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	100.00 aA	100.00 aA	100.00 aA	100.00 aA	97.50 aA
100	100.00 aA	98.75 aA	100.00 aA	100.00 aA	98.75 aA

F A= 47521.20** B= 2.55ns AxB=1.20ns

Crotalaria juncea

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	98.75 aA	100.00 aA	100.00 aA	81.25 aA	83.75 aA
100	97.50 aA	100.00 aA	100.00 aA	97.50 aA	99.50 aA

F A=648.76**1.40ns B=1.40ns AxB=1.21ns

Vicia sativa

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 cA
75	100.00 aA	100.00 aA	100.00 aA	97.00 aA	92.50 bB
100	100.00 aA	100.00 aA	100.00 aA	100.00 aA	98.50 aA

F A=17944.70** B=4.68** AxB=2.82**

Helianthus annuus

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 cA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	42.50 bB	95.75 aA	97.50 aA	96.25 aA	100.00 aA
100	60.00 aB	98.75 aA	96.25 aA	98.75 aA	98.75 aA

F A=3914.74** B=173.21** AxB=47.81**

Canavalis ensiformis

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 aA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	33.75 aB	27.50 bC	26.25 aC	52.50 aA	57.50 aA
100	35.00 aC	35.00 aC	45.00 aB	62.50 aA	50.00 aB

F A=52.02** B=17.29** AxB=6.93**

Mucuna cinerea

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	33.75 bC	72.50 aA	42.50 aB	40.00 aB	38.75 aB

100	42.50 aC	81.25 aA	51.25 aC	40.00 aC	65.00 aB
F	A=137.02** B=18.99** AxB=5.55**				
<i>Fagopyrum esculentum</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 cA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	78.75 bB	92.50 aA	98.25 aA	97.50 aA	88.75 aA
100	98.25 aA	97.50 aA	98.25 aA	98.75 aA	98.75 aA
F	A=707.73** B=2.34ns AxB=2.32**				
<i>Sorghum bicolor</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	91.25 aA	97.00 aA	97.50 aA	97.00 aA	97.50 aA
100	100.00 aA	100.00 aA	98.75 aA	97.50 aA	98.75 aA
F	A= 4625.83** B=0.52ns AxB=0.96ns				
<i>Pennisetum glaucum</i>					
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods				
	5DAA	30DAA	60DAA	90DAA	120DAA
0	0.00 bA	0.00 bA	0.00 bA	0.00 bA	0.00 bA
75	97.50 aA	97.5 aA	100.00 aA	96.25 aA	86.25 aB
100	100.00 aA	100.00 aA	100.00 aA	96.25 aA	92.50 aA
F	A=4.71** B=3008.92** AxB=1.49ns				

DAA: days after application. a.i.: active ingredient. Factor A: Doses; Factor B: Sowing Periods. ** significant and ^{NS} not significant at the 1%** probability level according to the f-test; Averages followed by equal lowercase letters in the column and uppercase in the row do not differ from each other according to the Scott-Knott test at 5% significance.

Table 2. Height (cm) and reduction of the dry mass of the aerial part (%) in relation to the control (dose 0g a.i. ha⁻¹), of green manure species, evaluated at 60 days after emergence, at different sowing periods after application (DAA) of indaziflam at doses of 75 and 100g a.i. ha⁻¹.

<i>Lupinus albus</i>										
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	33.25 a	-	33.25 a	-	33.25 a	-	33.25 a	-	33.25 a	-
75	14.50 b	71.97 a	28.12 a	43.86 a	12.72 b	80.31 a	14.50 b	86.09 a	20.37 a	76.10 a
100	17.42 b	88.67 a	17.45 a	70.08 a	10.57 b	87.85 a	20.25 b	100.00 a	16.12 a	79.64 a
F	6.25**	1.14 ns	3.38ns	0.87 ns	4.97**	0.21 ns	5.12**	2.98 ns	1.59ns	0.04 ns

<i>Raphanus sativus</i>										
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	71.92 a	-	71.92 a	-	71.92 a	-	71.92 a	-	71.92 a	-
75	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	20.25 b	86.09 a	6.87 b	90.54 a
100	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a
F	712.34**	-	712.34**	-	712.34**	-	25.42	2.98 ns	86.67	1.00 ns

<i>Avena strigosa</i>										
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	66.75 a	-	66.75 a	-	66.75 a	-	66.75 a	-	71.92 a	-
75	1.25 b	99.90 a	1.75 b	99.75 a	14.25 b	88.65 a	15.00 b	91.80 a	6.87 b	100.00 a
100	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a
F	271.24**	1.00 ns	246.34**	1.00 ns	17.04**	1.00 ns	15.36**	1.00 ns	86.67	-

<i>Secale cereale</i>										
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	38.10 a	-	52.70 a	-	52.70 a	-	52.70 a	-	52.70 a	-
75	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	18.00 b	90.07 a	10.00 b	75.00 a
100	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a
F	8.83**	-	418.90**	-	418.90**	-	16.84**	1.11 ns	22.04**	1.00 ns

<i>Crotalaria breviflora</i>										
Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	38.10 a	-	52.70 a	-	52.70 a	-	52.70 a	-	52.70 a	-
75	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	18.00 b	90.07 a	10.00 b	75.00 a
100	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a
F	8.83**	-	418.90**	-	418.90**	-	16.84**	1.11 ns	22.04**	1.00 ns

	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	16.10 a	-	16.10 a	-	16.10 a	-	16.10 a	-	16.10 a	-
75	2.62 b	100.00 a	0.00 b	100.00 a	0.00 b	83.11 a	4.00 b	94.15 a	5.25 b	82.53 a
100	0.00 b	93.50 a	0.00 b	100.00 a	3.75 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a
F	13.86**	1.00 ns	28.01**	-	9.13**	1.00 ns	8.35**	1.00 ns	8.61**	1.56ns

Crotalaria spectabilis

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	15.07 a	-	15.07 a	-	15.07 a	-	15.07 a	-	15.07 a	-
75	0.00 b	100.00 a	0.75 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	5.00 b	97.33 a
100	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.75 b	99.45 a
F	307.54**	-	166.36**	1.00 ns	307.54**	-	307.54**	-	16.85**	1.68 ns

Crotalaria juncea

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	57.25 a	-	57.25 a	-	57.25 a	-	57.25 a	-	57.25 a	-
75	2.18 b	96.50 a	0.00 b	100.00 a	0.00 b	100.00 a	19.25 b	89.40 a	21.00 b	90.58 a
100	3.87 b	99.26 a	0.00 b	100.00 a	0.00 b	100.00 a	8.75 b	94.72 a	2.57 b	99.84 a
F	79.09**	0.60 ns	188.41	-	188.41	-	8.97**	0.27 ns	13.52**	2.77 ns

Vicia sativa

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	15.72 a	-	15.72 a	-	15.72 a	-	15.72 a	-	15.72 a	-
75	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	3.87 b	95.83 a	8.67 b	88.23 a
100	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	6.12 b	98.04 a
F	1285.94**	-	1285.94**	-	1285.94**	-	33.33**	1.38 ns	5.06*	1.86 ns

Helianthus annuus

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	70.00 a	-	70.00 a	-	70.00 a	-	70.00 a	-	70.00 a	-
75	41.00 b	24.01 a	40.25 a	77.31 a	12.00 b	88.63 a	47.25 a	77.35 a	0.00 b	100.00 a
100	50.00 b	27.28 a	15.00 b	90.56 a	23.50 b	86.08 a	15.75 b	92.97 a	1.50 b	99.92 a
F	16.66**	0.05 ns	4.95*	1.00 ns	7.14*	0.02 ns	4.40*	2.27 ns	460.54**	1.00 ns

Canavalis ensiformis

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	34.62 a	-	34.62 a	-	34.62 a	-	34.62 a	-	34.62 a	-
75	29.75 a	24.82 a	35.50 a	25.27 a	29.50 a	42.35 a	23.50 b	40.32 a	4.25 c	37.95 a
100	34.25 a	31.10 a	30.50 a	25.27 a	33.75 a	56.04 a	27.25 b	43.05 a	20.5 b	40.43 a
F	2.30 ns	0.22 ns	0.18 ns	-	0.16 ns	0.61 ns	17.10**	4.46 ns	19.64**	7.48

Mucuna cinerea

Indaziflam (g	Sowing Periods									
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a.i. ha ⁻¹)	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	62.25 a	-	62.25 a	-	62.25 a	-	62.25 a	-	62.25 a	-
75	28.75 b	31.27 b	29.75 b	64.87 a	19.75 b	21.25 a	19.00 b	32.37 a	8.75 c	42.07 a
100	29.25 b	59.60 a	20.75 b	67.74 a	16.25 b	21.84 a	15.00 b	48.63 a	22.25 b	52.70 b
F	45.40**	6.36*	6.78*	0.02 ns	79.69**	0.00 ns	42.12**	0.028 ns	43.80**	9.74*

Fagopyrum esculentum

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	63.12 a	-	63.12 a	-	63.12 a	-	63.12 a	-	63.12 a	-
75	32.12 b	71.39 a	36.75 a	71.07 a	23.00 b	94.97 a	14.00 b	92.35 a	29.50 b	95.83 a
100	4.00 c	99.96 a	13.25 b	87.72 a	15.00 b	94.95 a	7.87 b	93.92 a	3.50 c	99.93 a
F	37.56**	3.09 ns	5.22**	0.97 ns	4.54*	0.00 ns	18.63**	0.03 ns	14.52**	1.99 ns

Sorghum bicolor

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	51.75 a	-	51.75 a	-	51.75 a	-	51.75 a	-	51.75 a	-
75	23.50 b	66.54 a	16.50 b	81.12 a	24.00 a	75.00 a	14.67 b	100.00 a	10.25 b	90.44 a
100	0.00 c	100.00 a	0.00 b	100.00 a	15.75 b	76.47 a	16.75 b	75.00 a	9.50 b	96.81 a
F	27.85**	2.65 ns	9.40**	1.07 ns	1.28ns	0.00 ns	3.00 ns	1.00 ns	8.51**	1.99 ns

Pennisetum glaucum

Indaziflam (g a.i. ha ⁻¹)	Sowing Periods									
	5DAA		30DAA		60DAA		90DAA		120DAA	
	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.	Height	Dry M.
0	47.12 a	-	47.12 a	-	47.12 a	-	47.12 a	-	47.12 a	-
75	7.50 b	85.69 a	15.00 b	78.91 a	0.00 b	100.00 a	28.00 a	71.44 a	41.50 a	63.78 a
100	0.00 b	100.00 a	0.00 b	100.00 a	0.00 b	100.00 a	16.75 a	58.06 a	20.50 a	93.04 a
F	27.18**	1.00 ns	7.26**	1.00 ns	152.99**	-	1.90 ns	0.22 ns	1.40 ns	1.92 ns

DAA: days after application. Dry M.: dry mass. a.i.: active ingredient. Factor A: Doses; Factor B: Sowing Periods. ** significant and ^{NS} not significant at the 1%** probability level according to the F-test; Averages followed by equal lowercase letters in the column and uppercase in the row do not differ from each other according to the Scott-Knott test at 5% significance.