

US EPA ARCHIVE DOCUMENT



DP Barcode :  
PC Code No. : 101101  
EFGWB Out : JAN 29, 1992

To: Robert Taylor  
Product Manager PM 25  
Special Review and Reregistration Division (H7508W)

From: Elizabeth Behl, Head (acting)  
Ground Water Technology Section  
Environmental Fate & Ground Water Branch/EFED (H7507C)

Thru: Henry Jacoby, Chief  
Environmental Fate & Ground Water Branch/EFED (H7507C)

*Dr. Wells for EB.*  
*Henry Jacoby*

Attached, please find the EFGWB review of...

Reg./File # : \_\_\_\_\_

Chemical Name : Metribuzin

Type Product : Herbicide

Product Name : Sencor

Company Name : Miles, Inc. (Mobay Corporation)

Purpose : Review information concerning potential ground-water monitoring site in Missouri.

Action Code : 496 EFGWB #(s): 80665, 80666, 80668 Total Review Time: 0.5 days

EFGWB Guideline/MRID Summary Table: The review in this package contains...

161-1	162-1	164-1	165-1	166-1	
161-2	162-2	164-2	165-2	166-2	site selection
161-3	162-3	164-3	165-3	166-3	
161-4	162-4	164-4	165-4	167-1	
201-1	163-1	164-5	165-5	167-2	
202-1	163-3				

**REGISTRATION DIVISION DATA REVIEW RECORD**

*For Internal Business Administration - Do Not Distribute Outside of Registration Division*

4-14-81

46153 RD

1. IDENTIFYING NUMBER <b>8125-270</b>	2. ACTION CODE <b>416</b>	3. DECISION NUMBER	TO BE COMPLETED BY PM
			5. RECORD NUMBER <b>220789</b>
			6. REFERENCE NUMBER <b>25</b>
			7. DATE RECEIVED (SPA) <b>2/21/80</b>
			8. STATUTORY DUE DATE
			9. PRODUCT MANAGER (PM) <b>Taylor / K. Walker</b>

10. CHECK IF APPLICABLE	11. DATE SENT TO HED/TSB
<input type="checkbox"/> Substitute Chemical	<b>4-14-81</b>
<input type="checkbox"/> Part of EPA	12. PRIORITY NUMBER <b>20</b>
<input checked="" type="checkbox"/> Review Required (See Form 800)	13. EXPECTED RETURN DATE <b>7-4-81</b>

15. INSTRUCTIONS TO REVIEWER

A. HED  Total Assessment - 3(c)(5)  Incremental Risk Assessment - 3(c)(7) and/or E.L. Johnson memo of May 12, 1977.

B. SPRD (Send Copy of Form to SPRD PM)

Chemical Undergoing Active RPAR Review

Chemical Undergoing Active Registration Standards Review

C.  BFSR

D.  TSS/RD

E.  Other

F. INSTRUCTIONS

**Other: Mr. Merton Williams**

**Photocopies of Site by Miss Co. Mo**

**sh # 101101-y**

16. RELATED ACTIONS

17. 3(c)(1)(D)

Use Any or All Available Information  Use Only Attached Data

Use Only the Attached Data for Formulation and Any or All Available Information on the Technical or Manufacturing Chemical.

18. REVIEWS SENT TO

TB  EEB  EF  PL

RCB  EFB  CH  SPSS

19. To	TYPE OF REVIEW	NUMBER OF ACTIONS							
		Registration	Petition	EUP	SLN	Sec. 18	Inert	MNR. USE	Other
HED	TOXICOLOGY								
	ECOLOGICAL EFFECTS								
	RESIDUE CHEMISTRY								
	ENVIRONMENTAL DATE	1							
RD/TSB	CHEMISTRY								
	EFFICACY								
	PRECAUTIONARY LABELING								
BFSR	ECONOMIC ANALYSIS								

20. <input type="checkbox"/> Label Submitted with Application Attached	21. <input type="checkbox"/> Confidential Statement of Formula	22. <input type="checkbox"/> Representative Labels Showing Accepted Uses Attached	23. Date Returned to RD (to be completed by HED)	24. Include an Original and 4 (four) Copies of This Completed Form for Each Branch Checked for Review.
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80668

**REGISTRATION AND DATA REVIEW REPORT**

Confidential - Federal Information - Do Not Release Without Specific Information E.P.A. (1988)

4-14-88

441504-1

<b>1. PRODUCT PM NUMBER</b> 441504-1	<b>2. ACTION CODE</b> 311	<b>3. ACCESSION NUMBER</b>	<b>TO BE COMPLETED BY PM</b>
			<b>5. RECORD NUMBER</b> 220,191
			<b>6. REFERENCE NUMBER</b> 25
			<b>7. DATE RECEIVED (EPA)</b> 4/14/88
			<b>8. STATUTORY DUE DATE</b>
			<b>9. PRODUCT MANAGER (PM)</b> Taylor W. Culter
			<b>10. PM TEAM NUMBER</b> 25
<b>11. TO BE COMPLETED BY RGS</b>			<b>11. DATE SENT TO MED/TS</b> 4-14-88
<b>12. PRIORITY NUMBER</b>			<b>12. PRIORITY NUMBER</b> 20
<b>13. PROJECTED RETURN DATE</b>			<b>13. PROJECTED RETURN DATE</b> 7-4-88

**15. INSTRUCTIONS TO REVIEWER**

**A. MED**  Total Assessment - 3(c)(5)  Incremental Risk Assessment - 3(e)(7) and/or E.L. Johnson memo of May 12, 1977.

**B. SPRD** (Send Copy of Form to SPRD PM)

Chemical Undergoing Active RPAR Review

Chemical Undergoing Active Registration Standards Review

**C.**  BFD  TSS/RD  Other

**F. INSTRUCTIONS**

Adm. Martin Williams

Letter on Ground Water

44-10101-1

**16. RELATED ACTIONS**

**17. 3(c)(1)(D)**

Use Any or All Available Information  Use Only Attached Data

Use Only the Attached Data for Formulation and Any or All Available Information on the Technical or Manufacturing Chemical.

**18. REVIEWS SENT TO**

TS  EEB  EF  PL

RCB  EFB  CH  BFD

	To	TYPE OF REVIEW	NUMBER OF ACTIONS							
			Registration	Petition	EUP	SLN	Sec. 18	Insert	MNR. USE	Other
MED		TOXICOLOGY								
		ECOLOGICAL EFFECTS								
		RESIDUE CHEMISTRY								
		✓ ENVIRONMENTAL DATA	1							
RD/TSS		CHEMISTRY								
		EFFICACY								
		PRECAUTIONARY LABELING								
BFD		ECONOMIC ANALYSIS								

**20.**  Label Submitted with Application Attached

**21.**  Confidential Statement of Formula

**22.**  Representative Labels Showing Accepted Uses Attached

**23.** Date Returned to RD (to be completed by MED)

**24.** Include an Original and 4 (four) Copies of This Completed Form for Each Branch Checked for Review.

8066

**REGISTRATION DIVISION DATA REVIEW RECORD**

Confidential Business Information - Does Not Contain Material Security Information (E.O. 12958)

4/14/88

80654 He 6

1. IDENTIFYING NUMBER <b>3115 270</b>	2. ACTION CODE <b>191</b>	3. ACCESSION NUMBER	TO BE COMPLETED BY PM
			5. RECORD NUMBER <b>220192</b>
			6. REFERENCE NUMBER <b>25</b>
			7. DATE RECEIVED (EPA) <b>4/14/88</b>
			8. STATUTORY DUE DATE
			9. PRODUCT MANAGER (PM) <b>Taylor VK Walker</b>
			10. PM TEAM NUMBER

11. DATE SENT TO HED/TSS	<b>4-13-88</b>
12. PRIORITY NUMBER	<b>30</b>
13. PROJECTED RETURN DATE	<b>7-4-88</b>

**14. INSTRUCTIONS TO REVIEWER**

A. HED  Total Assessment - 3(c)(5)  
 Incremental Risk Assessment - 3(c)(7) and/or E.L. Johnson memo of May 12, 1977.

B. SPRD (Send Copy of Form to SPRD/PM)  
 Chemical Undergoing Active RPAR Review  
 Chemical Undergoing Active Registration Standards Review

C.  BFS/D  
D.  TSS/RD  
E.  Other

**F. INSTRUCTIONS**

*Att: Menden Williams*

*site definition - Miss Co. Mo - 8*

*demolition monitoring*

**88-101104**

**16. RELATED ACTIONS**

**17. 3(c)(1)(D)**

Use Any or All Available Information  Use Only Attached Data  
 Use Only the Attached Data for Formulation and Any or All Available Information on the Technical or Manufacturing Chemical.

**18. REVIEWS SENT TO**

TB  EEB  EF  PL  
 RCB  EFB  CH  BFS/D

19. To	TYPE OF REVIEW	NUMBER OF ACTIONS							
		Registration	Petition	EUP	SLN	Sec. 18	Inert	MNR. USE	Other
HED	TOXICOLOGY								
	ECOLOGICAL EFFECTS								
	RESIDUE CHEMISTRY								
	<input checked="" type="checkbox"/> ENVIRONMENTAL DATA								
RD/TSS	CHEMISTRY								
	EFFICACY								
	PRECAUTIONARY LABELING								
BFS/D	ECONOMIC ANALYSIS								

20. <input type="checkbox"/> Label Submitted with Application Attached	21. <input type="checkbox"/> Confidential Statement of Formulae	22. <input type="checkbox"/> Representative Labels Showing Accepted Uses Attached	23. Date Returned to RD (to be completed by HED)	24. Include an Original and 4 (four) Copies of This Completed Form for Each Branch Checked for Review.
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80654

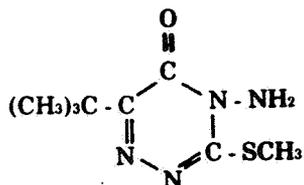
1. CHEMICAL:

Chemical name: 4-amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one

Common name: Metribuzin

Trade name(s): Sencor

Structure:

2. TEST MATERIAL:

Not Applicable.

3. STUDY/ACTION TYPE:

Review information concerning potential ground-water monitoring site in Mississippi County, Missouri.

4. STUDY IDENTIFICATION:

- 1) Title: Letter from John S. Thornton to Robert J. Taylor (PM 25) concerning Metribuzin Ground Water Monitoring Project (March 18, 1988).

Author(s): John S. Thornton (Mobay Corporation)  
 Identifying No.: 3125-270  
 Record Number: 220189  
 Date Sent to EFED: 4/13/88

- 2) Title: Letter from John S. Thornton to Robert J. Taylor (PM 25) concerning Metribuzin Ground Water Monitoring Project (March 30, 1988).

Author(s): John S. Thornton (Mobay Corporation)  
 Identifying No.: 3125-270  
 Identification Code: 220191  
 Date Sent to EFED: 4/13/88

- 3) Title: Site Definition: Metribuzin Groundwater Monitoring Project/ Mississippi County, Missouri

Author(s): M. Scott Watson and Gregory C. Owens  
 Identifying No.: 3125-270  
 Identification Code: 220192  
 Date Sent to EFED: 4/13/88

All of the above submitted for:

Miles, Inc. (Mobay Chemical Corporation)  
 P.O. Box 4913  
 Kansas City, MO 64120-0013

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5. REVIEWED BY:

Estella Waldman  
Hydrologist  
OPP/HED/EFED/Ground-Water Section

Signature: Estella WaldmanDate: 1/24/926. APPROVED BY:

Elizabeth Behl  
Acting Section Head  
OPP/HED/EFED/Ground-Water Section

Signature: Elizabeth BehlDate: 1/24/927. CONCLUSIONS:

In 1987, two soybean counties were chosen for the metribuzin small-scale ground-water monitoring studies. These counties were Champaign County, Illinois and Mississippi County, Missouri. Information submitted by Mobay indicated that the Mississippi, Missouri site (Site F) was not suitable for a study. Evidence included potential chemical contamination on the site, poor cooperation of the land owner, and evidence of site grading. Photographs depicting the potential contamination were submitted in EAB #80668 (3/18/88). EFGWB gave verbal approval to reject the site on 2/29/88.

EFGWB also indicated that it was not satisfied with the second site in Mississippi County (Site E), and requested that additional soil cores be drilled and analyzed. In EAB #80666 (3/30/88), Mobay agreed to send the additional data, and to suspend monitoring well installation on the site. The soil information was received on 4/1/88 in EAB #80665, and was reviewed by the Ground Water Section. EFGWB rejected this second potential site in Mississippi County after the soil characterization revealed the presence of restrictive clay layers.

8. RECOMMENDATIONS:

There are no recommendations at this time. Recommendations will follow the evaluation of the final report on the retrospective ground-water monitoring study for metribuzin (entitled "Small-Scale Retrospective Ground Water Monitoring Project for Metribuzin and Its Metabolites").

9. BACKGROUND:

Metribuzin (Sencor) was first registered for use in 1973. It is an aminotriazinone herbicide used to control grasses and broadleaf weeds on a variety of agricultural crops including alfalfa, asparagus, barley, carrots, field corn, lentils, peas, potatoes, sainfoin, soybeans, sugarcane, tomatoes, and wheat. It is also registered for use on fallow land (noncrop) and turfgrasses.

Metribuzin is applied either preemergence or early postemergence (USDA, 1988). Application rates range from 0.13 - 2.0 lb a.i. on most field and vegetable crops; 2 - 6 lb a.i. on sugarcane; and 1.0 - 7.5 lb a.i. on noncrop sites. According to the 1985 Registration Standard, metribuzin can be soil incorporated, surface applied, foliar applied, broadcast, or band incorporated. Application can be done by ground equipment, aerial equipment, or sprinkler irrigation. Metribuzin is a systemic herbicide that is absorbed by the plant root system, causing chlorosis, growth inhibition, and necrosis.

The MCL for metribuzin has not been established; the lifetime Health Advisory (HA) for a 70-kg adult has been established at 200 ppb. Metribuzin has been placed in Cancer Group D, indicating that it has not been classified (USEPA, 1991).

Metribuzin is stable to hydrolysis at pH 6 and 9. The photolysis half-life is estimated to be 15 days. The aerobic soil metabolism half-life ranges from 35 to 63 days in silt loam and sandy loam soils; the anaerobic soil metabolism half-life in silty clay soil was over 70 days. In the field, metribuzin dissipates with half-lives of less than 1 month to 6 months (USEPA, 1989a). Supplemental data indicate that the  $K_d$ 's for metribuzin range from 1.32 (sandy loam) to 1.90 ml/g (silt loam), and that the  $K_{oc}$  is 41 ml/g (USEPA, 1989b).

There are three metabolites of metribuzin. These include 6-t-butyl-1,2,4-triazin-3,5-(2H,4H)-dione (DADK); 6-t-butyl-3-(methylthio)-1,2,4-triazin-5(4H)-one (DA); and 4-amino-6-butyl-1,2,4-triazin-3,5-(2H,4H)-dione (DK) (USEPA, 1989a).

The EFGWB draft version of the 1991 Pesticides in Ground Water Database reports detections of metribuzin in 12 states. A total of 5,101 wells were analyzed for metribuzin; 205 of these had metribuzin residues. Metribuzin concentrations ranged from 0.001 to 25.10  $\mu\text{g/L}$ .

The requirement for a ground-water monitoring study was issued in the June 1985 Registration Standard for metribuzin. The study was one of the four "pilot monitoring projects" to test various strategies for ground-water monitoring studies.

#### 10. DISCUSSION:

The three documents submitted by Miles (Mobay) Chemical Company in 1988 are concerned with two potential sites for a ground-water monitoring study in Mississippi County, Missouri. The two sites were found unacceptable by EFGWB, and Miles Chemical Company terminated all work on the sites.

#### References

US Department of Agriculture. 1988. Herbicides: Chemistry, Degradation, and Mode of Action. ed's: Kearney, P.C. and Kaufman, D.D. Pesticide Degradation Laboratory/USDA/Agricultural Research Center. Marcel Dekker. New York.

USEPA. 1985. Guidance for the Reregistration of Pesticide Products Containing Metribuzin as the Active Ingredient. USEPA/OPP. Washington, D.C. June 1985.

\_\_\_\_\_. 1989a. Drinking Water Health Advisory: Pesticides. USEPA/Office of Drinking Water Health Advisories. Lewis Publishers. Chelsea, MI.

\_\_\_\_\_. 1989b. Pesticide Environmental Fate One Line Summary. USEPA/OPP/EFED. December 14, 1989.

\_\_\_\_\_. 1991. Drinking Water Regulations and Health Advisories. USEPA/Office of Water. Washington, D.C. November 1991.

Environmental Fate & Effects Division  
 PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY  
**METRIBUZIN**

Last Update on January 24, 1992

[V] = Validated Study    [S] = Supplemental Study    [U] = USDA Data

LOGOUT	Reviewer: EW	Section Head: JN	Date: 1/24/92
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Common Name: METRIBUZIN

PC Code # : 101101

CAS #: 21087-64-9

Caswell #:

Chem. Name : 4-AMINO-6-tert-BUTYL-3-(METHYLTHIO)-as-TRIZIN-5(4H)-ONE

Action Type: Herbicide

Trade Names: BAY 94337; LEXONE; SENCOR

(Formul'tn): WP, FLOWABLE CONC., DRY FLOWABLE CONC.,

Physical State:

Use : BROADLEAF WEEDS AND GRASSES IN SOYBEANS, POTATOES, BARLEY,  
 Patterns : WINTER WHEAT, ASPARAGUS, SUGARCANE, TOMATOES, LENTILS, PEAS,  
 (% Usage) : AND NONCROPLAND

Empirical Form: C<sub>8</sub>H<sub>14</sub>N<sub>4</sub>OS

Molecular Wgt.: 214.29

Vapor Pressure:

E -5 Torr

Melting Point : °C

Boiling Point:

°C

Log Kow : 1.65

pKa:

@ °C

Henry's : 2.33E-10 Atm. M<sup>3</sup>/Mol (Measured)

Solubility in ...

Water	1.22E 3	ppm	@20.0 °C
Acetone	E	ppm	@ °C
Acetonitrile	E	ppm	@ °C
Benzene	E	ppm	@ °C
Chloroform	E	ppm	@ °C
Ethanol	E	ppm	@ °C
Methanol	E	ppm	@ °C
Toluene	E	ppm	@ °C
Xylene	E	ppm	@ °C

Comments

Hydrolysis (161-1)

- [ ] pH 5.0:
- [ ] pH 7.0:
- [ ] pH 9.0:
- [ ] pH :
- [ ] pH :
- [ ] pH :

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Environmental Fate & Effects Division  
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY  
METRIBUZIN

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Photolysis (161-2, -3, -4)

[ ] Water:  
[ ] :  
[ ] :  
[ ] :

[ ] Soil :  
[ ] Air :

Aerobic Soil Metabolism (162-1)

[U] 40 days  
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Anaerobic Soil Metabolism (162-2)

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Anaerobic Aquatic Metabolism (162-3)

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Aerobic Aquatic Metabolism (162-4)

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Environmental Fate & Effects Division  
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY

**METRIBUZIN**

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Soil Partition Coefficient (Kd) (163-1)

[ ]	Sd	Si	Cl	%OM	pH	Kd
[S]	74	14	13	2.8	6.6	1.32
[S]	18	57	25	5.0	7.9	1.90
[S]	0	41	59	0.5	6.0	1.53
[ ]						
[ ]						

Soil Rf Factors (163-1)

[ ]	Sd	Si	Cl	%OM	pH	Rf
[S]	74	14	13	2.8	6.6	.60
[S]	56	21	23	0.6	5.5	.59
[S]	18	57	25	5.1	7.9	.62
[ ]						
[ ]						

Laboratory Volatility (163-2)

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Field Volatility (163-3)

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Terrestrial Field Dissipation (164-1)

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Aquatic Dissipation (164-2)

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Forestry Dissipation (164-3)

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Environmental Fate & Effects Division  
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY  
METRIBUZIN

Last Update on January 24, 1992

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Long-Term Soil Dissipation (164-5)

[ ]  
[ ]

Accumulation in Rotational Crops, Confined (165-1)

[S] RESIDUES ACCUMULATED IN PEANUTS THAT WERE PLANTED  
[ ] IN SdLm 246 DAYS AFTER APPL. OF 1 LB AIA

Accumulation in Rotational Crops, Field (165-2)

[ ]  
[ ]

Accumulation in Irrigated Crops (165-3)

[ ]  
[ ]

Bioaccumulation in Fish (165-4)

[ ]  
[ ]

Bioaccumulation in Non-Target Organisms (165-5)

[ ]  
[ ]

Ground Water Monitoring, Prospective (166-1)

[ ]  
[ ]  
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Ground Water Monitoring, Small Scale Retrospective (166-2)

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[ ]

Ground Water Monitoring, Large Scale Retrospective (166-3)

[ ]  
[ ]  
[ ]  
[ ]

Ground Water Monitoring, Miscellaneous Data (158.75)

[ ] METRIBUZIN HAS BEEN DETECTED IN 12 STATES AT CONCENTRATIONS  
[ ] RANGING FROM 0.001 TO 25.10 µG/L (PPB).  
[ ]

Environmental Fate & Effects Division  
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY  
METRIBUZIN

Last Update on January 24, 1992

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Field Runoff (167-1)

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Surface Water Monitoring (167-2)

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Spray Drift, Droplet Spectrum (201-1)

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Spray Drift, Field Evaluation (202-1)

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Degradation Products

N-glucoside of 6-T-butyl-1,2,4-triazin-3,5(2H,4H)-dione (.047ppm)  
6-t-butyl-3(methylthio)-1,2,4-triazin-5(4H)-one (.014 ppm)  
4-amino-6-t-butyl-1,2,4-triazin-3,5(2H,4H)-dione (.005 ppm)  
Concentrations shown represent data from organosoluble degradates  
in soil at 393 days posttreatment

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Environmental Fate & Effects Division  
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMARY  
**METRIBUZIN**

Last Update on January 24, 1992

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Comments

Soil Koc = 41.

References:

Writer : PJH, EW

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