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The Key for the Identification of the Weed Seeds Found in Clover Seed

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TABLE—CONTINUED.

SPECIES.	STOMATA PER SQ. INCH.		SIZE OF STOMATA IN INCHES.		PALISADE LAYERS.	
	Upper surface.	Under surface.	Upper surface.	Under surface.	Upper surface.	Under surface.
<i>Acer dasycarpum</i>	0	210,000	0	L. .00057 W. .00044	1	0
<i>Medicago sativa</i>	105,000	91,000	5	L. .00088 W. .00070	2+	0
Russian Oak (<i>Quercus robur</i> , var. <i>pedunculata</i>).....	0	315,900	0	L. .00119 W. .00091		0
Mongolian Pear (<i>Pyrus sinensis</i>).....	0	82,500	0	L. .00177 W. .00135	2	0
<i>Prunus serotina</i>	0	235,000	0	L. .00115 W. .00075	2	0
<i>Populus alba</i>					2	0
Lutovka (cherry) <i>Prunus cerasus</i>	0	109,165			1+	0
<i>Rosa rugosa</i>					2+	0
<i>Prunus angustifolia</i>	0	150,000			1	2(?)
<i>Celtis occidentalis</i>					1	0
<i>Prunus pumila</i>	0	55,000				0
Apricot (Nichol's) <i>Prunus armeniaca</i>	0	253,500			2	0
12 M (Pear) <i>Pyrus communis</i>	0	33,000			2	0
327 (Apple) <i>Pyrus malus</i>	0	90,000			2	0
75 M (Apple) <i>Pyrus malus</i>	0	88,000			2	0
Wythe (Apple) <i>Pyrus malus</i>	0	197,000			2	0
43 (Apple) <i>Pyrus malus</i>	0	150,000			2	0
15 M (Apple) <i>Pyrus malus</i>	0	167,500			2	0
Fluke's Wild Crab (<i>Pyrus ioensis</i>).....	0	155,000			2	0
Talman Sweet (<i>Pyrus malus</i>).....	0	220,000			2	0
Rawle's Janet (<i>Pyrus malus</i>).....	0	170,000			2	0
<i>Pyrus toriugo</i>					2	0

A KEY FOR THE IDENTIFICATION OF THE WEED SEEDS FOUND IN CLOVER SEED.¹

BY F. C. STEWART.

The identification of weed seeds, though an important matter, is not an easy one. The average person knows Fox-tail, and probably that is about all. Even botanists, who have not given the subject special attention, will be surprised to find how small a number of weed seeds they are able to identify without study.

Outside of systematic works² but little has been written on seed characters. What has been written is scattered through Experiment Station Bulletins and Agricultural Reports, and is not in an available form. However, the Germans have done some good work in this line, notably Harz³ and Nobbe.⁴

A good key for the identification of American weed seeds would be of great

¹Part of a thesis on THE IMPURITIES OF CLOVER SEED, written for the degree of Bachelor of Science, Iowa Agricultural College.

²Gray's Manual of the Botany of the Northern U. S., Chapman's Flora of the Southern States, Coulter's Rocky Mountain Botany, etc.

³Landwirtschaftliche Samenkunde, two volumes, Berlin 1885, Paul Parey. Handbuch der Samenkunde, Berlin, Wilgandt, Hempel and Parey, 1876.

value to our botanists and seedsmen. The key of Dr. Harz is good, but it is too general in its nature for our purpose. Below is offered a key designed especially for the identification of weed seeds commonly found in clover seed. Though rude and incomplete, it may be of some service.

KEY.

- A. Fruit not enclosed by a glume and palea; not a caryopsis.
- I. Achenes, sharply triangular.
1. Black and shiny; sides concave; length, 1".
Polygonum acre, H. B. K.
 2. Black, but not shiny; usually enveloped by the close fitting calyx; sides not concave; length, $1\frac{1}{3}$ -2".
Polygonum convolvulus, L.
 3. Brown and shiny; embryo peripheral.
 - a Not enveloped by calyx; length, 1".

<i>Rumex</i> ...	}	<i>Crispus</i> , L.
		<i>Altissimus</i> , Wood.
 - b Usually closely enveloped by calyx; length, about $\frac{1}{2}$ ".
Rumex acetosella, L.
 4. Brown or light colored not shining; embryo central.
Carex.
 5. Reddish black; not shiny; pointed; length, $1\frac{1}{3}$ ".
Polygonum aviculare, L.
- II. Achenes or nutlets, slightly triangular.
1. An achene, nearly flat; one angle very obtuse and rounded; somewhat ovate; dull black; length, $1\frac{1}{3}$ ".
Polygonum hydropiper, L.
 2. Nutlet; brown; narrowly ovate; length, 1'; one face flat, the other two meeting in an obtuse angle which is bordered on each side by a line of darker brown; very smooth.
Brunella vulgaris, L.
- III. Achenes, lenticular or ovate and flattened.
1. Usually black; embryo⁶ coiled in a ring around the albumen; never more than 1" in length; not pointed at apex; sides convex.
 - a Shiny black; without utricle.
 - * Orbicular; $\frac{1}{3}$ - $\frac{2}{3}$ " broad.
Amarantus albus, L.
 - ** Somewhat ovate; length $\frac{1}{2}$ - $\frac{2}{3}$ ".
Amarantus retroflexus, L.
 - * * Less shiny; orbicular; $\frac{3}{4}$ -1" broad.
Amarantus blitoides, Watson.
 - b Dull grayish black; orbicular; utricle frequently present; $\frac{3}{4}$ " broad.
Chenopodium album, L.

⁵ In the genera *Polygonum* and *Rumex* many achenes are found from which the pericarp has been removed in threshing. Such are flesh colored and of the same shape as the achenes before mutilation.

⁶ The pericarp is often partially removed in *Amarantus* and *Chenopodium* showing the flesh colored seed. The coiled embryo can be readily seen with a hand lens. Usually enough of the pericarp remains to identify the genus.

2. Black and shiny; 1" or more broad; abruptly tipped with a short point.
- a Gibbons flattened, sometimes slightly triangular; orbicular to slightly ovate; 1-1 $\frac{1}{4}$ " broad.
Polygonum pericaria, L.
- b Concave on both sides; orbicular; 1 $\frac{1}{2}$ -1 $\frac{3}{4}$ " broad.
Polygonum pennsylvanicum, L.
- IV. Seeds sharply angled in various ways, but not triangular; not achenes.
1. Dull black or brown seeds with one convex face which is more or less rough. Angles not winged except in *Verbena hastata*.
- a Nearly uniform in size throughout the entire length of the seed; length, 2 $\frac{1}{2}$ -3 times the thickness; 3-faced, one convex, the other two plane and meeting in a moderately sharp angle; light brown.
- Verbena*.
- * Convex face prominently 4-ridged longitudinally; upper half transversely wrinkled.
- f Length, 1-1 $\frac{1}{5}$ "; plane faces with whitish roughening.
V. bracteosa, Michx.
- ff Length, 1-1 $\frac{1}{5}$ "; little or no whitish roughening on plane faces.
V. angustifolia, Michx.
- fff Length, 1 $\frac{1}{3}$ -1 $\frac{1}{2}$ "; otherwise same as in *V. angustifolia*.
V. stricta, Vent.
- ** Not prominently ridged nor wrinkled.
- f Length, $\frac{3}{4}$ -1"; angles not winged.
V. urticifolia, L.
- ff Length, 1"; angles between the convex face and the plane faces slightly winged.
V. hastata, L.
- b Seeds flattish; angled in various ways; smaller at the ends than in the middle.
- f Dark brown, nearly black; length, $\frac{3}{4}$ -1 $\frac{1}{4}$ ".
Plantago rugelii, Decaisne.
- ff Light brown; length, $\frac{1}{2}$ ".
Plantago major, L.
2. Seeds irregular and winged on the angles, giving them a shriveled appearance; light brown; length, $\frac{3}{4}$ ".
Oenothera biennis, L.
- V. Obconical achenes; longitudinally ribbed; light colored.
1. Ribs beset with tubercles; light brown; length, $\frac{3}{4}$ ".
Anthemis cotula, D. C.
2. Not tubercled; truncate at apex; length, $\frac{3}{4}$ "; lighter colored than last.
Anthemis arvensis, L.
3. More slender; stripes of black between the ribs; $\frac{3}{4}$ " long.
Chrysanthemum leucanthemum, L.

VI. Boat shaped seeds, oblonged and hollowed on one face.

1. Shiny brown; about twice as long as broad. Light colored line running lengthwise the convex face; length, $1\frac{1}{5}$ ".

Plantago lanceolata, L.

2. Brown but not shiny; a slight transverse depression running across the middle of the convex face; length, $1-1\frac{1}{2}$ "; the hollow white lined; two white rimmed depressions at the bottom of the hollow.

Plantago patagonica var. *aristata*, Gray.

VII. Seeds globose or nearly ovoid.

1. Greenish, oily, naked seed; nearly ovoid; pointed; length, 1".

7 *Ambrosia* $\left\{ \begin{array}{l} \textit{artemisiaefolia}, \text{L.} \\ \textit{psilostachya}, \text{D. C.} \end{array} \right.$

2. Gray black; globose; $\frac{1}{8}$ " in diameter; surface irregularly roughened.

Cuscuta epithymum, Murr.

B. Fruit enclosed by glume and palet; a caryopsis.

I. Flowering glume and palet smooth, shiny and coriaceous.

1. One side flat, the other with a prominent hump; shiny green.

a Orbicular; 1" broad.

Paspalum leve, Michx.

b Ovate, tapering to an acute point; length, $1\frac{1}{2}-2$ ".

8 *Panicum crus-galli*, L.

2. One side somewhat flattened, but the other not prominently humped.

a Ovoid; very dark green; length about $\frac{3}{4}$ ".

Panicum capillare, L.

b Narrowly oblong; light green; length about $1\frac{1}{5}$ ".

Panicum proliferum, Lam.

c Linear oblong; pointed slightly at both ends; the second sterile glume and the imperfect flower generally closely enveloping the perfect flower.

* Perfect flower usually black; first sterile glume almost wanting, second one equaling the flower; length, 1".

Panicum glabrum, Gaudin.

** Perfect flower greenish; first sterile glume small, second not more than half the length of the flower; length, $1\frac{1}{2}$ ".

Panicum sanguinale, L.

II. Flowering glume and palet roughened, but coriaceous; ovate.

1. Length about 1"; greenish, light colored or dark brown; flowers striate lengthwise and dotted.

Setaria viridis, Beauv.

7 Seeds of these two species generally appear naked and in this condition, I know of no characters by which they can be separated. But when found with the involucre intact they are easily separated. *A. artemisiaefolia* has a crown of 6-8 stout tubercles while *A. psilostachya* is smooth.

8 Frequently the sterile glumes and the imperfect flower remain attached. In such cases the species is easily distinguished by the stiff bristles on the second sterile glume and the glume of the imperfect flower. The glume of the imperfect flower is also awned.

2. Length, $1\frac{1}{4}$ - $1\frac{3}{4}$ " ; tawny yellow, brown or nearly black; transversely wrinkled.

⁹ *Setaria glauca*, Beauv.

- II. Flowering glume and palet membranaceous, glume truncate; palet 2-nerved; length of flowering glume about $\frac{3}{4}$ ".

¹⁰ *Phleum pratense*, L.

EXPLANATION OF PLATE.

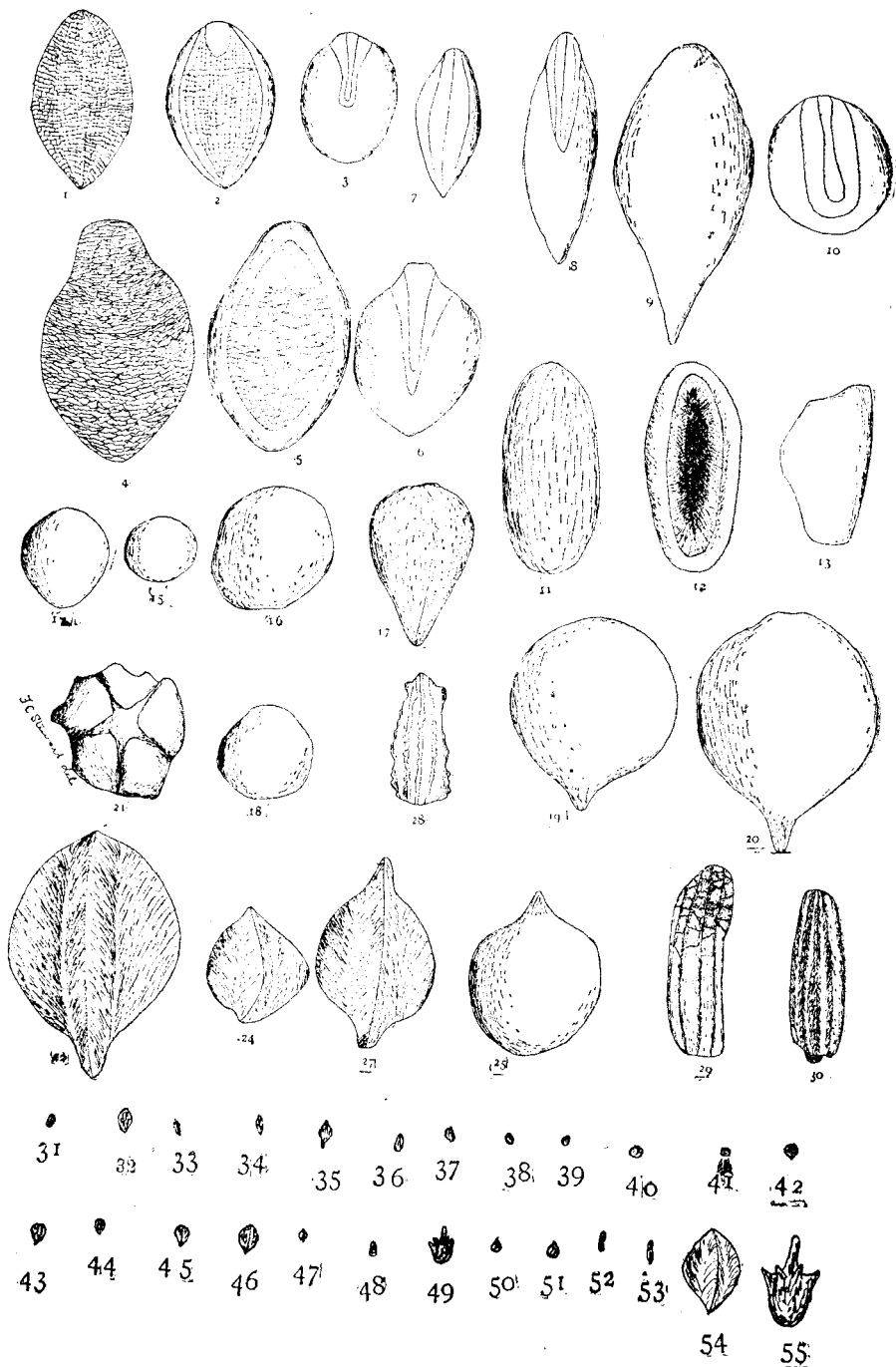
1. *Setaria viridis* (upper surface).
2. *Setaria viridis* (under surface).
3. *Setaria viridis* (with glumes removed).
4. *Setaria glauca* (upper surface).
5. *Setaria glauca* (under surface).
6. *Setaria glauca* (glumes removed).
7. *Panicum glabrum*.
8. *Panicum sanguinale*.
9. *Panicum crus-galli*.
10. *Panicum crus-galli* (glumes removed).
11. *Plantago lanceolata* (convex face).
12. *Plantago lanceolata* (concave face).
13. *Plantago rugelii*.
14. *Amarantus retroflexus*.
15. *Amarantus albus*.
16. *Amarantus blitoides*.
17. *Polygonum aviculare*.
18. *Chenopodium album* (without utricle).
19. *Polygonum persicaria*.
20. *Polygonum hydropiper*.
21. *Chenopodium album* (with utricle).
22. *Polygonum aere*.
24. *Rumex acetosella*.
25. *Ambrosia artemisiifolia* (naked).
27. *Rumex crispus*.
28. *Anthemis cotula*.
29. *Verbena bracteosa*.
30. *Chrysanthemum leucanthemum*.

NATURAL SIZE DRAWINGS.

31. *Setaria viridis*.
32. *Setaria glauca*.
33. *Panicum glabrum*.
34. *Panicum sanguinale*.
35. *Panicum crus-galli*.
36. *Plantago lanceolata*.
37. *Plantago rugelii*.

⁹ *S. glauca*, *S. viridis* and *P. crus-galli* frequently appear naked; *P. crus-galli* and *S. glauca* are orbicular, flat on one side, well rounded on the other, and are quite difficult to separate. *S. viridis* is oblong ovoid. All these are light green in color.

¹⁰ This very frequently occurs naked. Then it is light brown, ovoid, $\frac{1}{2}$ " long.



38. *Amarantus retroflexus*.
39. *Amarantus albus*.
40. *Amarantus blitoides*.
41. *Chenopodium album* (without utricle).
42. *Polygonum persicaria*.
43. *Polygonum hydropiper*.
44. *Polygonum aviculare*.
45. *Polygonum acre*.
46. *Polygonum convolvulus*.
47. *Rumex acetosella*.
48. *Anthemis cotula*.
49. *Ambrosia artemisiifolia* (with utricle).
50. *Rumex crispus*.
51. *Ambrosia artemisiifolia* (naked).
52. *Verbenia bracteosa*.
53. *Chrysanthemum leucanthemum*.
54. *Polygonum convolvulus* (enlarged three times).
55. *Ambrosia artemisiifolia* (enlarged, with involuere).

PRELIMINARY OBSERVATIONS ON A CATTLE DISEASE FREQUENTLY
OCCURRING IN IOWA.

BY W. B. NILES.

This disease is called hydrophobia by the people at large in a majority of cases. By veterinarians it is diagnosed as rabies, cerebro-meningitis, enteritis and impaction of the third stomach.

As regards its distribution, it may be said to occur most frequently north of a line drawn east and west separating the State into halves. In the extreme southern part cases are rarely reported.

Nature, Symptoms and Course of the Disease.—In some outbreaks the cattle are reported to have been bitten by a dog, but seldom has the owner been able to positively say that such is the case. In a majority of cases no dog is mentioned in connection with them, and no strangely acting dog has been reported in the neighborhood.

In all outbreaks the disease runs a lingering course in the herd. Several cases occur and the time elapsing between the first and last case extends over several weeks; in some outbreaks over five or six months. The symptoms observed in the different outbreaks are very uniform. So uniform that it is easy in most instances to recognize the trouble from descriptions written by the owner of the cattle.

At first the animal appears uneasy, is alert, taking more notice than common of everything taking place about it, is very attentive if a strange man or dog appears, and a slight switching of the tail is often observed. The eyes soon become staring and wild, and eventually reddened. The animal early refuses food and drink, and as a consequence becomes very gaunt in appearance. Early in the course of the