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WEST VIRGINIA

Agricultural Experiment Station

MORGANTOWN, W. VA.

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YOUR WEEDS AND YOUR NEIGHBOR'S.

Part 2.

DISTRIBUTION OF OUR WEEDS.

BAD POINTS OF WEEDS.

WEEDS AS FODDER FOR STOCK.

CHEMICAL WEED EXTERMINATORS.

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FEBRUARY, 1892.



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## YOUR WEEDS AND YOUR NEIGHBOR'S.

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C. F. MILLSPAUGH, M. D.

My idea in issuing Bulletin No. 12 on the Canada Thistle, in December, 1890, was not only to call attention to that most pestilential and obnoxious weed, and to stimulate the farmers of this State to a deeper interest in the weeds of their neighborhood; but also to gain their co-operation in determining the extent of such growths in the State, as well as their ideas of the best methods of procedure in relation to weeds, special and general. How far I have succeeded these bulletins will show. Suffice it to say, however, that I feel justified in remarking that I do not think any Station in the Union ever gained so many willing and painstaking answers to any set of questions, or have awakened so much interest among their farming communities as we have in this. Hearty co-operation has been unstintedly gained, and all requests for sample weeds promptly and kindly granted. For all of this, I wish to heartily and publicly express the thanks of this Station, and hope that my efforts to tabulate these answers will result in placing all this material before you in a satisfactory and easily understood form.

This bulletin contains a digest of the material received arranged by sections and counties, in order that the weeds should be more or less grouped according to their alliance to each other, as to character of soil, nature, altitude and geographic position. In studying this method of grouping, it must be borne in mind, that I have in most part used only the matter received from my correspondents; that their observations are generally confined to their limited neighborhoods; that their ideas differ according to their methods of farming and the crops and stock they raise; and that many years of constant and personal travel and observation only could solve the many problems offered by the weed and filth question.

This artificial grouping is as follows:

(1) Valley Counties: *i. e.* Such as lie in the eastern Pan Handle of the State and on the eastern slopes and foot-hills of the Alleghany Mountains, comprising the fertile valleys of the Potomac, Cacapon, Opequon and Shenandoah Rivers, and the ridges and slopes of the North and South Fork, Patterson's Creek, Big Piney,

Jersey, North River, and Great North Mountains, viz: Jefferson, Berkeley, Morgan, Hampshire, Hardy, Mineral, Grant and Pendleton.

(2) The North-eastern Mountain Counties: *i. e.* such as lie in or near the north-eastern stretches of the higher Alleghanies, the Rich, Laurel, Cheat, Shavers, East and Dry Fork Mountains; and the valleys of the Forks of Cheat and Tygart's Valley Rivers, viz: Tucker and Randolph.

(3) The Eastern Mountain Counties: *i. e.* Those that lie on or near the higher Eastern Alleghany ranges and Lower Rich and Cheat, as well as Elm, Buffalo Bull, Buffalo Lick, Beaver Lick, Cranberry, Big Clear Creek, Elk, Peeter's and Pott's Mountains, and the valley of the Greenbrier River, viz: Webster, Pocahontas, Greenbrier, Summers and Monroe.

(4) The Northern Counties: *i. e.* Such as lie along the northern or Pennsylvania boundary line, and Lower Cheat and Monongahela Rivers, viz: Preston, Monongalia, Marion and Taylor.

(5) The Northwestern Ohio River Counties, comprising such as lie in the upper Pan Handle of the State and on the banks and terraces of the Ohio River, as far South as the mouth of the Little Kanawha, viz: Hancock, Brooke, Ohio, Marshall, Wetzell, Tyler, Pleasants and Wood.

(6) The Western Ohio River Counties: Comprising the balance of such as lie along the Ohio, and the mouths of the Great Kanawha, Guyandotte and Big Sandy Rivers, viz: Jackson, Mason, Cabell and Wayne.

(7) The North Central Counties: Comprising all the central counties lying more or less north of the Great Elk River, and constituting the principal water shed of the Little Kanawha and Monongahela, viz: Barbour, Harrison, Doddridge, Upshur, Lewis, Ritchie, Wirt, Roane and Braxton.

(8) The South Central Counties: Comprising those lying south of the Great Elk River and north of the Guyandotte and Spruce Fork Mountains, through which flow the New, Gauley, Elk, Big Coal and Great Kanawha Rivers, viz: Putnam, Kanawha, Clay, Nicholas, Fayette, Lincoln, Boone and Raleigh.

(9) The Southern Boundary Counties: *i. e.* Those drained by the Guyandotte and Big Sandy Rivers, viz: Logan, Wyoming, McDowell, Mercer.

## LIST OF OBSERVERS.

Name.	Place.	County.
1. J. F. Woodyard,	Parkersburg,	Wood.
2. T. D. Ross,	Canton,	Marion.
3. Luther Haymond,	Clarksburg,	Harrison.
4. C. W. Stump.	Slanesville,	Hampshire.
5. J. W. Biller,	Summit Point,	Jefferson.
6. J. D. Fry,	Summit,	Jefferson.
7. Smith A. Day,	Elizabeth,	Wirt.
8. R. H. Douglass,	Douglass,	Jackson.
9. L. C. Applegate,	Wellsburg,	Brooke.
10. J. W. Stevens,	Laurel Point,	Monongalia.
11. L. H. Wilcox,	Farmington,	Marion.
12. G. V. Forinash,	Lorentz,	Upshur.
13. J. W. Boggess,	Lumberport,	Harrison.
14. S. A. Frankhauser,	New Martinsville,	Wetzel.
15. W. T. Wooley,	Odaville,	Jackson.
16. John Baird,	Elm Grove,	Ohio.
17. A. J. Bonafield,	Tunnelton,	Preston.
18. J. L. Curtis,	Wellsburg,	Brooke.
19. J. A. Deeds,	Jumping Branch,	Summers.
20. D. Bassel,	Lost Creek,	Harrison.
21. A. J. Bissett,	Littleton,	Wetzel.
22. C. M. Maxon,	Lost Creek,	Harrison.
23. Frank S. Evans,	N. Cumberland,	Hancock.
24. B. F. Curry,	Hamlin,	Lincoln.
25. A. E. Roush,	New Haven,	Mason.
26. J. R. Stout,	Bridgeport,	Harrison.
27. H. Manley,	Eldora,	Marion.
28. F. Gillman,	Davisville,	Wood.
29. W. C. Boor,	Barracksville,	Marion.
30. Wallace Robinson,	Frankford,	Greenbrier.
31. J. F. Bryant,	Waverly,	Wood.
32. Dr. G. L. Nye,	Hurricane,	Putnam.
33. Amos Jolliff,	Uniontown,	Wetzel.
34. J. W. Miles,	Overhill,	Upshur.

Name.	Place.	County.
35. J. M. Hendricks,	Mohlers,	Jefferson.
36. Sidney Haymond,	Quiet Dell,	Harrison.
37. J. M. Metheny,	Terra Alta,	Preston.
38. John Waustreet,	Leopold,	Doddridge.
39. J. T. Davis,	Vadis,	Lewis.
40. J. N. Rhorbough,	Camden,	Lewis.
41. Jefferson Robinson,	Wallace,	Harrison.
42. M. V. Hurst,	Wilsonburg,	Harrison.
43. A. H. Snider,	Hoult,	Marion.
44. Adam Fisher.	Moorefield,	Hardy.
45. E. M. Reid,	Medley,	Grant.
46. Edwin Burgess,	Laural Dale,	Mineral.
47. W. J. Knott,	Molers,	Jefferson.
48. B. M. Jones,	Morgantown,	Monongalia.
49. M. A. Bickar,	St. Joseph,	Marshall.
50. J. W. Snediker,	Pleasant Valley,	Marshall.
51. C. R. Pickening,	Lone Cedar,	Jackson.
52. J. P. Clark,	Burning Springs,	Wirt.
53. E. J. Humphreys,	Belleville,	Wood.
54. James Dickson,	West Liberty,	Ohio.
55. E. A. Garten,	Forest Hill,	Summers.
56. D. C. Hudkins,	Overfield,	Barbour.
57. C. O. Eberhardt,	Tyner,	Wood.
58. S. W. Hartley,	Masontown,	Preston.
59. William Taylor,	Endicott,	Wetzel.
60. J. A. Jolliff,	Endicott,	Wetzel.
61. J. Hunter Robinson,	Patterson's Depot,	Mineral.
62. John Tabb,	Oakton,	Berkerley.
63. C. H. Hartley,	Adamsville,	Harrison.
64. B. Mollohon,	Replete,	Webster.
65. E. S. Ball,	Peniel,	Roane.
66. Jos. Kelso,	Concord,	Hampshire.
67. John W. Rauch,	Martinsburg,	Berkeley.
68. J. W. Shropshire,	Burning Springs,	Wirt.
69. Daniel Kuhns,	Endicott,	Wetzel.
70. John W. Boyd,	Franklin,	Pendleton.
71. John S. Pancake,	Romney,	Hampshire.
72. D. C. Greene,	Grass Lick,	Jackson.
73. J. P. Post,	Good Hope,	Harrison.
74. Isaac Smith,	Jerry's Run,	Wood.
75. C. S. Wilcox,	Sandy,	Jackson.
76. M. S. Hall,	Ritchie C. H.	Ritchie.
77. W. S. McGregor,	Highland,	Ritchie.
78. John M. Daniel,	Shenandoah Junct.,	Jefferson.
79. Marion Hollis,	Gerrardstown,	Berkeley.
80. N. Bacon,	Talcott,	Summers.
81. H. Scott & H. B. Barbor,	Princeton,	Mercer.
82. Mary Stowasser,	Union Ridge,	Cabell.



Name.	Place.	County.
83. R. W. Means,	Knottsville,	Taylor.
84. J. B. Mairs,	Pocotaligo,	Kanawha.
85. W. L. Dunn,	Cashmere,	Monroe.
86. Jas. Sellards,	Adkin's Mills,	Wayne.
87. J. P. Lynch, Jr.	Mt. Clare,	Harrison.
88. Jno. Myer,	Florence,	Randolph.
89. W. H. Ruble,	Fountain Springs,	Wood.
90. J. W. Brown,	Clarksburg,	Harrison.
91. A. F. Davis,	Rippon,	Jefferson.
92. D. B. Sheetz,	Three Churches,	Hampshire.
93. E. B. Beuson,	Terra Alta,	Preston.
94. Thos. B. Prickett,	Barracksville,	Marion.
95. Jos. Ogden,	Wallace,	Harrison.
96. B. A. Powell,	Morris,	Wirt.
97. T. K. Massie,	Concord Church,	Mercer.
98. William Mead,	Stone Coal,	Wayne.
99. Elihu Ward,	Lee Bell,	Randolph.
100. J. Graham & J. B. Ayres,	Clayton,	Summers.
101. D. W. McKune,	Jerry's Run,	Wood.
102. J. J. Coffindaffer,	Jarvisville,	Harrison.
103. W. H. Hyatt,	Smithton,	Doddridge.
104. Chas. Seffens,	Blennerhassett,	Wood.
105. B. F. Ball,	Elizabeth,	Wirt.
106. H. D. Baber,	Fayetteville,	Fayette.
107. Austin Robinson,	Knoxville,	Marshall.
108. S. S. Shaver,	Bulltown,	Braxton.
109. John Stanbaugh,	Egton,	Preston.
110. J. J. McKinney,	Reedsville,	Preston.
111. Martin L. Cox,	Loudenville,	Marshall.
112. G. W. Long,	Wick,	Tyler.
113. H. Moore,	Newton,	Roane.
114. James L. Fitzgerald,	Evergreen,	Upshur.
115. R. F. Hughes,	Eldora,	Marion.
116. E. McKee,	Paradise,	Putnam.
117. George Fuss,	Hedgesville,	Berkeley.
118. G. M. Mounts,	Murphy's Mills,	Wood.
119. James Horn,	Capon Bridge,	Hampshire.
120. A. F. Conaway,	Barracksville,	Marion.
121. J. P. Campbell,	Garfield,	Jackson.
122. Enoch Nutter,	Pepper,	Barbour.
123. Jenkins Miller,	Pine Grove,	Wetzel.
124. Jacob Shamp,	New Martinsville,	Wetzel.
125. P. E. McNemar,	Alkire's Mills,	Lewis.
126. Thomas McIntire.	Bloomery,	Hampshire.
127. E. M. Hartley,	Masontown,	Preston.
128. E. Hoff,	Berea,	Ritchie.
129. G. W. Perdue,	Bramwell,	Mercer.
130. W. C. Moore,	Mountain Cove,	Fayette.

Name.	Place.	County.
131. Barney Siebert,	Meighen,	Marshall.
132. J. A. Sandige,	Beets,	Fayette.
133. J. T. Jackson,	Clio,	Roane.
134. J. A. Davis,	Evelyn,	Wirt.
135. M. M. Dent,	Reedy Ripple,	Wirt.
136. A. Looney,	Looneyville,	Roane.
137. J. W. Ferrell,	Looneyville,	Roane.
138. D. H. Arrick,	Welcome,	Marshall.
139. Chas. F. Eagle,	Lobelia,	Pocahontas.
140. F. B. Wilcox,	Wilding,	Jackson.
141. Oliver Scott,	Table Rock,	Raleigh.
142. G. M. Rodgers,	Columbia Sul. Sprs,	Greenbrier.
143.	Blandon,	Kanawha.
144. T. Stalling,	Medley,	Grant.
145. Thos. Alderson,	Johnson's Cross R'ds	Monroe.
146. H. C. Hyer,	Lloydsville,	Braxton.
147. George Parker,	Clio,	Roane.
148. S. W. Wiles,	Amblersburg,	Preston.
149. G. W. Gander,	Clio,	Roane.
150. Silas C. Hatcher,	Egeria,	Raleigh.
151. S. A. McCarty,	Lobelia,	Pocahontas.
152. J. P. Thompson,	Williamsburg,	Greenbrier.
153. George C Whiting,	Summit Point,	Jefferson.
154. Henderson Gross,	Gazil,	Kanawha.
155. Sibert Speek,	Hedgesville,	Berkeley.
156. H. W. Frye,	Wardensville,	Hardy.
157. James Binns,	Independence,	Preston.
158. J. C. Mann,	Pickaway,	Monroe.
159. C. W. Morris,	Reedy,	Roane.
160. G. W. Williams,	Trout Valley,	Greenbrier.
161. C. S. Jones,	Piedmont,	Mineral.
162. A. F. Cochran,	New Martinsville,	Wetzel.
163. F. F. Randolph,	New Milton,	Doddridge.
164. S. C. Gist,	Wellsburg,	Brooke.
165. John L. Babb,	Greenland,	Grant.
166. James W. Benner,	Leetown,	Jefferson.
168. Jacob McLean,	Belington,	Barbour.
169. Fremont McClure,	Squire Jim,	McDowell.
170. Gen. John McCausland,	Grimm's Landing,	Mason.
171. Dice Bennett,	Dillon's Run,	Hampshire.
172. J. L. Knight,	Maggie,	Mason.
173. L. D. Anderson,	Walkersville,	Lewis.
174. Chas. W. Morris,	Tornado,	Kanawha.
175. George E. Moray,	Rock Gap,	Morgan.
176. C. W. Coyle,	Charlestown,	Jefferson.
177. C. W. Henshaw,	Middleway,	Jefferson.
178. Jefferson Stephens,	Adkin's Mills,	Wayne.
179. John Price,	Proctor,	Wetzel.

Names.	Place.	County.
180. W. D. Zinn,	Phillippi,	Barbour.
181. G. W. Annon,	Thornton,	Taylor.
182. John W. Hawkins,	Centre Point,	Doddridge.
183. Wm. H. T. Lewis,	Kabletown,	Jefferson.
184. B. W. Knode,	Rippon,	Jefferson.
185. E. J. Owings,	Holiday's Cove,	Hancock.
186. Booth Bond,	Aberdeen,	Lewis.
187. John Menear,	Independence,	Preston.
188. John L. Roderick,	Mount Storm,	Grant.
189. W. H. Woodull,	Beaver Mills,	Nicholas.
190. David Simmons,	Walnut Grove,	Roane.
191. Joseph Hill,	Gazil,	Kanawha.
192. S. H. Secrist,	Maysville,	Grant.
193. J. C. Miller,	Wellsburg,	Brooke.
194. J. W. Miller,	Barboursville,	Cabell.
195. W. S. Goodwin,	Texas,	Tucker.
196. S. N. Smith,	Rockville,	Preston.
197. Col. McKinney,	Hebron,	Pleasants.
198. James Wilmoth,	Kerens,	Randolph.
199. Alex. Clohan,	Martinsburg,	Berkeley.
200. E. L. Nuzum,	Garfield,	Jackson.
201. A. F. Slaughter,	Belgrove,	Jackson.
202. A. J. House,	Reedy,	Roane.
203. A. D. Hopkins,	Kanawha Station,	Wood.
204. D. D. Johnson,	Long Reach,	Tyler.
205. C. L. Jones,	Mannington,	Marion.
206. John Bacher,	Deer Walk	Wood.
207. James W. Lake,	Kanawha Head,	Upshur.
208. J. A. Evans,	Raleigh C. H.,	Raleigh.
209. B. D. Gangwer,	Parkersburg,	Wood.
210. A. & R. McLeod,	White Sul. Springs,	Greenbrier.
211. John Ferguson,	Schultz,	Pleasants.
212. M. Byrnside,	Carpenters,	Putnam.
213. Austin J. Hatcher,	Egeria,	Raleigh.
214. Marshal A. Johnson,	Johnson's Cross R'ds	Monroe.
215. L. Owens,	Odaville,	Jackson.
216. S. D. Stump,	Higginsville,	Hampshire.
217. William H. Smith,	Hazleton,	Preston.
218. Chas. L. Davis,	Fort Spring,	Greenbrier.
219. Henry Keadle,	Pickaway,	Monroe.
220. William L. Knotts,	Grafton,	Taylor.
221. D. S. Hartman,	Confidence,	Putnam.
222. H. P. Collett,	Hendricks,	Tucker.
223. George White,	White Sul. Springs,	Greenbrier.
224. M. Morris,	Silverton,	Jackson.
225. M. W. Morrison,	Peniel,	Roane.
226. B. F. Maloney,	Sedan,	Hampshire.
227. R. N. Fout,	Purgitsville,	Hampshire.

Name.	Place.	County.
228. T. H. Morris,	Rockport,	Wood.
229. Geo. A. Alexander,	Milton,	Cabell.
230. A. E. Black,	Lee,	Wirt.
231. Geo. W. Wells,	Cornwallis,	Ritchie.
232. J. T. Harvey,	Blaine,	Mineral.
233.	Springfield,	Hampshire.
234. Ben F. Sivert,	Glen Easton,	Marshall.
235. A. T. Heck,	Barracksville,	Marion.
236. V. B. Frame,	Frametown,	Braxton.
237. J. H. Teagarden,	Blake,	Wetzel.
238. Jacob Weaver,	French Creek,	Upshur.
239. Jno. W. Sions,	Old Fields,	Hardy.
240. Eben Langfitt,	Fairview,	Hancock.
241. C. B. Shreve, Jr.,	Overhill,	Upshur.
242. A. A. Welton,	Petersburg,	Grant.
243. Isaac Knotts,	Grafton,	Taylor.
244. J. H. Mandeville,	Indian Mills,	Summers.
245. John S. Barnes,	Ritchie O. II.,	Ritchie.
246. Edwin Hollister,	Welch Glade,	Webster.
248. E. W. Barnes,	Countsville,	Roane.
249. J. E. Clarke,	Hemlock,	Upshur.
250. A. O. Donovan,	Fowler's P. O.,	Brooke.
251. N. D. McLain,	Blandville,	Doddridge.
252. John Stout,	Wall ce,	Harrison.
253. Lewis M. Pritchard,	Walnut Grove,	Roane.
254. P. E. Reed,	Valley Fork,	Clay.
255. L. D. Hambric,	Tate Creek,	Braxton.
256. C. S. Hatcher,	Kentuck,	Jackson.
257. G. M. Nettles,	Klmira,	Braxton.
258. Charles E. Davis,	Rockport,	Wood.
259. Amos Jones,	Gray's Flat,	Marion.
260. John M. Gribble,	Leopold,	Doddridge.
261. M. L. Knight,	Meadland,	Taylor.
262. W. Guseman,	Henry,	Preston.
263. D. S. Minear,	St. Georges,	Tucker.
264. Patrick Haman,	New Hope,	M rcer.
265. C. R. Hanaman,	Elizabeth,	Wirt.
266. T. S. Colter,	Newville,	Braxton.
267. Strother Hatten,	Egypt,	Wayne.
268. Dr. J. J. Hopkins,	Upper Tract,	Pendleton.
269. Eli Crouch,	Crickard,	Randolph.
270.	Princeton,	Mercer.
271. Frank Ralphsnider,	Gray's Flat,	Marion.
272. H. W. Schell,	Greenland,	Grant.
273. J. D. Rardon,	Ravenswood,	Jackson.
274. George A. Porterfield,	Charlestown,	Jefferson.
275. F. M. Horner,	Dayton,	Harrison.
276. Robert Davis,	Basnett,	Marion.

Name.	Place.	County.
277. G. W. Putnall,	Williamstown,	Wood.
278. Camden Trimble,	Pepper,	Parbour.
279. Jas. A. Thomas,	Flat Run,	Marion.
280. John A. Chew,	Charlestown,	Jefferson.
281. J. W. Bogges,	Lumberport,	Harrison..
282. T. C. Hammet,	Schultz,	Pleasants.
283. Joseph McMurrin,	Shepherdstown,	Jefferson.
284. Obed Babb,	Greenland,	Grant.

## DISTRIBUTION OF OUR WEEDS.

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The first question propounded in Bulletin No. 12, was: "What are the worst weeds in your neighborhood? Please write them in the order of their obnoxiousness beginning with the worst."<sup>7</sup>

This question was answered by 284 observers, whose observations with my own, are compiled in the following summaries of the tables at the end of this bulletin; which will present many points of interest to those who desire to study them.

The numbers in the column headed "Observer," refer back to the same numerals set against the names in the list of observers on pages 179-85, which gives the locality in the county as well. The numerals set opposite the observer's number in the tables refer to the order in which he considers the weeds bad, *i. e.*, observer 183, who is found to reside near Kabletown, in Jefferson, judges the Blue Thistle to merit the first rank as a bad weed in his neighborhood; that Dog Fennel ranks second; that the Ox-eye Daisy ranks third; and so on throughout his list.

The small figures following the names of the weeds and raised above the line refer in all cases in this work to the same numbers in the Descriptive List of Weeds forming Part 3 of this bulletin, where the weeds are treated of specifically and more at length.

### Valley Counties.—Table 1\*.

It will be seen that in the Valley Counties, the Blue Thistle is reported from each; that it is more frequently considered a bad weed than any other plant mentioned; and that it is given standing as the worst weed by 18 out of 38 reporters.

Note the fact that the Glenn Weed<sup>15</sup> and Water Cress<sup>11</sup> run out after passing through Jefferson and Berkeley Counties, they not being again reported. The Naked Weed<sup>112</sup> runs out in Hampshire. The Ox-eye Daisy<sup>99</sup> though mentioned in all counties of the table is more particularly considered in Grant and Hampshire than in any of the others.

\*These tables are placed at the end of this Bulletin.

### Northeastern Mountain Counties—Table 2.

From reports it will be seen that Yarrow<sup>98</sup> is considered the worst weed in this region; the Ox-eye Daisy<sup>99</sup> ranging second and Broom Sedge<sup>191</sup> third. The Blue Thistle<sup>125</sup> so prominent in the Valley Counties, also extends into these; while the Broom Sedge,<sup>191</sup> which will appear as one of the principal weeds westward, seems to end its eastern course with these counties, not passing as yet into the Valley Counties to any extent.

### Eastern Mountain Counties.—Table 3.

In the eastern Mountain Counties, the Wild Carrot<sup>59</sup> is according to the table considered the worst weed, although the Ox-eye Daisy<sup>99</sup> is reported more frequently.

In our journey toward the south and west, through these tables, the Broom Sedge<sup>191</sup> is now become to be considered more frequently as a bad weed, as is also the Buck Plantain.<sup>159</sup> The Blue Thistle<sup>125</sup> and Canada Thistle<sup>108</sup> still remain as dreaded plants, while the Teasle,<sup>70</sup> Sand-briar,<sup>132</sup> and Blue,<sup>80</sup> and White Devils,<sup>79</sup> which we will grow sadly well acquainted with as we pass westward through the State, are noted here in their easternmost extension.

### Northern Counties.—Table 4.

According to the table, the Ox-eye Daisy<sup>99</sup> is considered the worst weed in the Northern Counties, being the first mentioned by 19 out of 25 observers. Broom Sedge<sup>191</sup> ranks second, and Bitter Dock<sup>167</sup> third.

The peculiarities of this section are as follows: The total absence of any report of Wild Carrot<sup>59</sup> in Marion County, while every observer in Taylor County, which lies adjacent, reports the weed. The absence of report upon the Common Thistle,<sup>105</sup> except in Preston County; the prominence given to the Iron Weed<sup>72</sup> in Marion County, while none but myself think it a bad weed in any other; and the utter ignoring of the Spanish Needle,<sup>95</sup> which is known to be very prevalent throughout the region.

Were the Teasle<sup>70</sup> better known by name, it would doubtless have been reported upon more frequently, as it is quite common in these counties. The Blue Thistle<sup>125</sup> and Canada Thistle<sup>108</sup> so frequently reported in the previous sections are entirely absent in this.

### North-Western Ohio River Counties—Table 5.

From the tabulation compiled as reported, the Wild Carrot<sup>59</sup> is decided upon as the worst weed in the North-western Ohio River Counties, the second worst the Ox-eye Daisy<sup>99</sup> and Bitter Dock<sup>167</sup> the third.

The Sand-briar<sup>132</sup> does not seem to receive the number of votes here that it should, as I feel certain that it bids fair to be the very

worst weed throughout the extent of the River Counties. Wild Flax<sup>128</sup> is intruding its spikes of yellow flowers throughout this section, the little notice it has received being in all probability due to the lack of knowledge concerning its names as given in my query. The Canada Thistle<sup>108</sup> is shown to extend only to Marshall County, which I judge to be correct. Golden Rod<sup>77</sup> is doubtless rightly considered as to its range and greatest prevalence. Broom Sedge<sup>101</sup> substantially begins to be a pest in Pleasants and as will be seen by the next following table continues to the southern limit of the State; future tables will show its progress eastward from the river counties. The White Devil<sup>79</sup> and its sister species the Blue Devil<sup>80</sup> also begin their obtrusive frequency here, and will be found further on to receive more attention in the southern and central counties. Why Wetzel County should proclaim so plainly against Spanish Needles<sup>95</sup> while the balance of this district is silent, can only be answered by the supposition that the observers of that county are probably more interested in sheep as wool producers than those of the other counties. Wood here begins the complaint against the Wild Sweet Potato<sup>127</sup> that is taken up with more vehemence as we pass on southward and eastward. Yarrow<sup>98</sup> receives considerable attention in this section, but it is not even mentioned in the counties farther down the river. The Buck Plantain<sup>159</sup> a perfect nuisance from here on, receives its merited attention.

#### Southern Ohio River Counties.—Table 6.

In the southern tier of Ohio River Counties, the Blue Devil<sup>80</sup> is shown to reach its rank of King-of-bad-weeds there, having for its consort the Broom Sedge,<sup>191</sup> and its retinue Bitter Dock,<sup>167</sup> Cockle-bur,<sup>90</sup> and Spanish Needles.<sup>95</sup> From this line of reports, we must judge that our observers live mostly upon the fertile bottom lands of the River. Our surmise is sustained by the absence of reports on Sorrel<sup>168</sup> and Cinquefoil.<sup>47</sup>

The Ox-eye Daisy,<sup>99</sup> up to this date, seems to have ceased in its progress down the river after passing through Jackson County, and to seek here an eastern extension, as the following tables will show. The Wild Carrot<sup>59</sup> spreads downward one county farther before moving east. Wing Stem<sup>93</sup> a weed that seems to come down the feeders of the Ohio, is probably not reported to greater extent on account of the lack of a name being known for it. The Sand-briar<sup>132</sup> would probably have received more attention had we gained more reporters in Cabell and Wayne; though I judge from personal observations that it turns eastward at about the mouth of the Great Kanawha in Mason County. Why the White Devil<sup>79</sup> should lack consideration in Jackson and Mason I can not decide, as it is certainly quite prevalent in both.

#### Northern Central Counties—Table 7.

In tabulating the Northern Central Counties, I have been forced



to leave out Calhoun and Gilmer, as I have no reports whatever from them. My own observations there are on record among my notes, but without the corroboration of others there I do not feel like using them in this table.

An examination of the table will show that Broom Sedge<sup>191</sup> is entitled to the first rank as a bad weed in this section; the Sandbriar<sup>132\*</sup> second; and the honors of the third place equally divided among Blue Devils,<sup>8</sup> Ox-eye Daisies<sup>99</sup> and Elders.<sup>66</sup>

The points of interest developed by the table are as follows: The Canada Thistle<sup>108</sup> is only to be found in two counties, viz: Harrison and Doddridge; the Teasle<sup>70</sup> in Barbour, Harrison and Upshur. Field Garlic<sup>178</sup> is only complained of in Barbour. The Wild Sweet Potato<sup>127</sup> appears only to be a nuisance in the westernmost counties of the section; while the Blue Devil<sup>80</sup> does not become particularly obnoxious until south of the northern tier of the section, which bounds also the Northern Counties where this weed is not particularly prevalent.

### Southern Central Counties—Table 8.

The meagre reports from the Southern Central Counties with absence of any from Boone, render the standing of the worst weeds somewhat uncertain. Broom Sedge<sup>191</sup> might, however, be considered the worst, with the Ox-eye Daisy<sup>99</sup> second, and White Devil<sup>79</sup> third.

### Southern Boundary Counties—Table 9.

The absence of any reports whatever from Logan and Wyoming Counties, and the meagre returns from Raleigh and McDowell, render remarks upon this table too unsatisfactory. They are, therefore, omitted.

### Summary—Table 10.

The three worst weeds in the State are, therefore, Ox-eye Daisy,<sup>99</sup> Broom Sedge,<sup>191</sup> and Wild Carrot,<sup>69</sup> according to those who have weeds to deal with. All things considered, however, the Canada Thistle,<sup>108</sup> Broom Sedge,<sup>191</sup> and Blue Thistle,<sup>125</sup> prove to be the worst according to the discredit of bad points.

From the foregoing tabulations, and the tables of bad points, I have been able to select the following, as the fifty worse weeds of this State:

## THE 25 WORST WEEDS.

---

- |                                       |   |
|---------------------------------------|---|
| 1. Ox-eye Daisy, <sup>99</sup>        | ( <i>Chrysanthemum Leucanthemum</i> , L.)   |
| 2. Broom-Sedge, <sup>101</sup>        | ( <i>Andropogon Scoparius</i> , L.)   |
| 3. Pasture Thistle, <sup>105</sup>    | ( <i>Cnicus lanceolatus</i> , L.)   |
| 4. Burdock, <sup>104</sup>            | ( <i>Arctium Lappa</i> , L.)  |
| 5. Bitter-Dock, <sup>167</sup>        | ( <i>Rumex obtusifolius</i> , L.)   |
| 6. Wild Carrot, <sup>59</sup>         | ( <i>Daucus Carota</i> , L.)  |
| 7. Elders, <sup>66</sup>              | ( <i>Sambucus Canadensis</i> , L.)  |
| 8. Ironweed, <sup>73</sup>            | ( <i>Vernonia Noveboracensis</i> (L.),<br>Wild, and <i>altissimus</i> , Nutt.)        |
| 9. Yarrow, <sup>98</sup>              | ( <i>Achillea Millefolium</i> , L.)   |
| 10. Buck Plantain, <sup>159</sup>     | ( <i>Plantago lanceolata</i> , L.)  |
| 11. Cockle-bur, <sup>90</sup>         | ( <i>Xanthium Canadense</i> , L.)   |
| 12. Blue Thistle, <sup>125</sup>      | ( <i>Echium vulgare</i> , L.)   |
| 13. Rag Weed, <sup>88</sup>           | ( <i>Ambrosia artemisiaefolia</i> , L.)   |
| 14. Spanish Needles, <sup>95</sup>    | ( <i>Bidens bipinnata</i> , L.)   |
| 15. White-top, <sup>82</sup>          | ( <i>Erigeron annuus</i> , L.)  |
| 16. Sand-briar, <sup>132</sup>        | ( <i>Solanum Carolinense</i> , L.)  |
| 17. Sorrel, <sup>168</sup>            | ( <i>Rumex acetosella</i> , L.)   |
| 18. Garlic, <sup>178</sup>            | ( <i>Allium vineale</i> , L.)   |
| 19. White Devil, <sup>79</sup>        | ( <i>Aster latriflorus</i> (L.), Britt. var<br><i>hirsuticaulis</i> , (Linol), frag.) |
| 20. Blue Devil, <sup>80</sup>         | ( <i>Aster Cordifolius</i> , L., var <i>laevigatus</i> , Port.,                       |
| 21. Canada Thistle, <sup>108</sup>    | ( <i>Cnicus arvensis</i> (L.), Hoffm.)  |
| 22. Morning Glory, <sup>126</sup>     | ( <i>Ipomoea purpurea</i> (L.), Lam.)   |
| 23. Wild Sweet-potato, <sup>127</sup> | ( <i>Ipomoea pandurata</i> (L.), Meyer.)  |
| 24. Dog-fennel, <sup>97</sup>         | ( <i>Anthemis Cotula</i> , L.)  |
| 25. Cinquefoil, <sup>47</sup>         | ( <i>Potentilla Canadensis</i> , L.)  |

Several others might be added to this list, which, however, is already almost too bulky, to handle. Such weeds as the Naked-weed,<sup>112</sup> Skeleton-weed,<sup>112</sup> Devil's Grass,<sup>112</sup> or Hog-bite;<sup>112</sup> (*Chondrilla juncea*, L.); the Glenn-weed,<sup>15</sup> Glen-pepper,<sup>15</sup> Crowd-Weed,<sup>15</sup> or English Peppergrass:<sup>15</sup> (*Lepidium campestre*,); Chess:<sup>196</sup> (*Bromus scalinus*, L. & *racemosus*, L.); and numerous others, which we will treat at length in Part 3 of this bulletin.

## SECONDARY LIST OF WORST WEEDS.

- 
26. Briars,<sup>45</sup> (Rubus villosus Ait. & Canadensis, L.)
27. Mullein,<sup>136</sup> (Verbascum Thapsus, L.)
28. Wild Cotton, Milk Weed,<sup>119</sup> (Asclepias Syriaca, L.)
29. Wild Parsnip,<sup>62</sup> (Pastinaca sativa, L.)
30. Indian Hem,<sup>117</sup> (Apocynum androsaemifolium, L.)
31. Poke Weed,<sup>165</sup> (Phytolacca decandra, L.)
32. Teasle,<sup>70</sup> (Dipsacus sylvestris, Mill.)
33. Golden Rod,<sup>77</sup> (Solidago juncea, Ait.) (mostly.)
34. Smart Weed,<sup>169</sup> (Polygonum) (several species.)
35. Horse Weed,<sup>113</sup> (Lacuta Cnadensis, L.)
36. Wild Flax,<sup>138</sup> (Linaria vulgaris, Mill)
37. Indian Mallow,<sup>28</sup> (Abutilon Avicennae, Gaertn.)
38. Fox Tail,<sup>190</sup> (Setaria glauca, (L.) Beauv.)
39. Crab Grass,<sup>189</sup> (Panicum sanguinale, L.)
40. Elecampane,<sup>85</sup> (Inula Helenium, L.)
41. Stick Seed,<sup>41</sup> (Desmodium (numerous species.)
42. Corn Cockle,<sup>20</sup> (Lychnis Githago, L.)
43. Beggar's Lice,<sup>95</sup> (Bidens frondosa, L. & Connata, Muhl.)
44. Jimson Weed,<sup>135</sup> (Datura Stram L. & Tatula, L.)
45. Shepherd's Purse,<sup>13</sup> (Capsella Bursa-pastoris, L.)
46. Tar Weed,<sup>54</sup> (Cuphaea petiolata, (L.) Koehne.)
47. Wing Stem,<sup>93</sup> (Actinomeris alternifolia, (L.) D.C.
48. Spiny Amaranth,<sup>161</sup> (Amarantus spinosus, L.)
49. Tall Ragweed,<sup>87</sup> (Ambrosia trifida, L.)
50. Nigger Head,<sup>91</sup> (Rudbeckia hirta, L.)

## BAD POINTS OF WEEDS.

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Plant species like animals are in a constant state of strife with each other. They are all provided with some means more or less efficacious of both gaining a livelihood and perpetuating their species. Those first procuring a foothold in any given locality have a natural tendency to crowd out others, the larger tend to smother the smaller or prevent their seeds from germinating properly; the perennials to supersede the annuals; and the most profuse seed bearers to gradually occupy most of the space near the parent plant.

In considering the bad points of weeds, I shall calculate them much as a fancier would the good points in his pet animal, but of course reversed, for it is easily understood that all those attributes that are good points in a useful plant, naturally become bad attributes when that plant exists as a weed.

The ten principal bad points are as follows:

### 1. Prevalence.

This point I have determined from the preceding pages, which give substantially the observations of my reporters throughout the State; they are necessarily incomplete. In the following tables of bad points, this one is of course arbitrarily averaged from that source for the whole State. Any one of the weeds may be high in prevalence in one locality and very low in another. Such a weed as the Rag Weed<sup>88</sup> can be easily understood to merit (10) the highest grade, as it is found every where in the State and plentiful wherever it grows. Others are not so readily rated.

### 2. Seeding Capacity.

Some weeds are known to produce great quantities of seed, others but little, this point is easily understood and almost always readily determined.

### 3. Dissemination of Seeds.

A wide difference exists among plants as to the power they may

possess of self-distributing their seeds. Some have no known method of accomplishing this end, others have peculiarly efficient means. The gradation between that plant whose seed pods simply fall with the plant unopened, and that which has no pod, but whose surrounding tissues actually spread back out of the way while the seeds in the meantime produce feathery sails with which the least zephyr will waft them long distances and finally drop them point downward to the soil, is very gradual. The former plant would merit but a single (1) point here, while the latter would readily score ten (10).

#### 4. Root and Stem Propagating.

Under this rubric are scored all methods for plant reproduction except by its seed. Some plants have actually no method of reproduction except by seed, whereas others like the Canada Thistle<sup>108</sup> are capable of plentifully reproducing without.

#### 5. Resistance to Eradication.

There is no use of explaining this point to those who have toiled and sweat over the Common Elder<sup>66</sup>, the Sumach<sup>34</sup> and the Sand-briar<sup>132</sup>, or who have smiled as they struck the weakling with their hoe and turned its tender roots upward to the pitiless sun.

This point is really a combination of points 1, 3, and 4.

#### 6. Aggressiveness.

The persistence of a weed to spread in spite of hard labor expended against it; the rapidity of its traversing an extended area and its determined effort to occupy the soil to the exclusion of useful plants; together with other items of like nature, go toward making such weed an aggressive one.

#### 7. Robbing the Soil.

Some weeds extract from the soil to aid in their nutrition much more of those elements needed by the farmer to support his crops than others. We have at this station done all that time would allow us to get at this matter thoroughly in regard to weeds. In the table of points, I have expressed this quality of robbing the soil by the same range of figures as other points, but here the figures also mean dollars and cents as will be understood by reading Part 1 on weeds as Fertilizing Material. For example, I rate Iron Weed<sup>72</sup> as 10 as we know it to remove \$10.63 worth of fertilizing matter from the soil per dry ton; the Broom Sedge<sup>191</sup> is rated as 3 as it robs the farmer of \$3.03 worth of the substances needed for his crops.

## 8. Recognition of the Plant.

Those weeds that are well known by the farmer wherever he sees them, like the Rag Weed<sup>88</sup> are considered low (2) in this bad quality; while such plants as are newly coming into our farms take higher values in this regard, as many farmers fail to know the plants or recognize their bad qualities when they see them. None, however, have been ranked higher than eight (8) as they will be known in some sections of the State if not in others.

## 9. Longevity.

Some weeds live but a short time even if left to themselves, not even meriting the rank of an annual; others live one or two years; others a few seasons, and others seem to have a tendency of out-living the farmer himself; their rank in point here is therefore usually easy to decide upon.

## 10. Obnoxiousness.

Some weeds have other bad qualities beside their mere presence where they are not desired. Some take a high rank under this head as dangerous poisons either to man or domestic animal; such as the Cow's Bane<sup>63</sup>, Wild Parsnip<sup>62</sup>, Green Hellebore, Laurel, Stagger Bush, Indian Tobacco<sup>115</sup>, etc; others have briars or strong prickles which tear the clothing or wound cattle; others have seeds that injure the quality of wool, or render animals restive, or restless and ill from irritation; like Burdock<sup>104</sup>, Spanish Needles<sup>95,96</sup>, Beggar's Lice<sup>41</sup>, some Grasses etc; others still yield a sticky substance that utterly ruins wool in the market; as the tar weed<sup>54</sup>, etc. All these are qualities that tend to alter the points in the scale of obnoxiousness.

There are numerous other bad points in weeds that deserve more or less consideration; but I have carried the matter as far as necessary, and consistent in the table appended. Such points may be mentioned, however, as a matter for thought. They are:

### Recognition of Seed.

This is a point of great interest and of frequent use in our laboratory, and one also very useful indeed to the Agriculturist. This point in connection with

### Separation of Seed,

that is to say the ease or difficulty attending the separation of the weed seed from that of useful plants, would certainly be very desirable thing for every farmer to know, that he might be able not only to recognize but to separate all weed seeds from his sowings.

Both, however, would require great pains, time and labor, as well as some relatively costly apparatus. I deem it more important, therefore to work toward a seed control in the State than to attempt to teach the farmer that which he has no time to learn nor put in practice. As to seed grown by himself, he will naturally see to it that it is kept free from weeds should he look out as usual for his own interests. Another point might be made upon

### **The Vitality of Weed Seeds.**

But as I have as yet had no time at this Station to thoroughly test the matter, I prefer not to treat of this doubtful question.

### **Forage Value.**

This point might also be made a subject of comparison had our Chemist had more time for such analyses as would be necessary. As it is, the chapter upon that subject must suffice at least for the present.

The chances of a weed harboring fungi or injurious insects might also be considered here had our publication been delayed a sufficient length of time to carry on such investigation.

We feel assured, however, that we have presented the subject as fully as we could do it justice, and hope that it will teach those who desire to learn something at least of the methods that might be followed to gain a knowledge of the true nature of weeds.

Many of the conditions change in different localities; we have therefore in the table attempted to average them as nearly as possible for the whole State.

	Prevalence	Seedling capacity.	Dissemination seed.	Root and Stem propagation.	Resistance to Eradication.	Aggressiveness.	Robbing Soil.	Recognit'n of Plant.	Longevity.	Obnoxiousness.	Total bad Points.
Ox-eye Daisy (1)*	6	10	8	6	8	10	10	6	4	10	78
Broom-sedge (2)	6	8	10	8	10	10	3	4	8	10	77
Thistle (3)	8	10	10	5	4	4	10	2	6	5	64
Burdock (4)	6	6	8	2	6	5	10	2	8	10	63
Bitter-dock (5)	6	10	4	4	4	2	10	4	8	4	56
Wild Carrott (6)	6	10	8	2	10	10	10	6	8	10	80
Elders (7)	5	5	2	10	10	4	7	2	10	4	59
Iron-weed (8)	8	6	4	4	4	4	10	2	4	4	50
Yarrow (9)	7	8	6	2	4	6	10	5	6	6	60
Buck Plantain (10)	7	10	6	2	6	10	?	6	8	6	61†
Cockle-bur (11)	6	6	7	4	5	5	10	5	4	5	57
Blue Thistle (12)	6	10	6	10	8	10	10	6	10	10	86
Rag-weed (13)	10	10	4	2	5	8	7	2	2	6	56
Spanish Needles (14)	10	8	8	2	2	10	7	2	4	10	63
White-top (15)	10	4	4	4	7	5	?	5	3	5	47†
Sand Brier (16)	8	4	4	4	10	10	?	5	8	10	63†
Sorrel (17)	8	8	4	4	2	2	7	6	8	4	53
Field Garlic (18)	6	5	4	0	10	10	?	2	4	10	51†
White Devil (19)	8	7	5	5	10	10	9	4	4	8	70
Blue Devil (20)	8	7	5	5	10	10	8	4	4	8	71
Canada Thistle (21)	4	10	10	10	10	10	7	4	10	10	85
Morning Glory (22)	6	4	4	2	4	5	?	2	2	8	37†
Wild Sweet Potato (23)	8	4	4	8	4	6	?	3	8	8	53†
Dog Fennel (24)	8	5	4	2	4	2	?	6	6	4	41†
Cinquefoil (25)	8	3	3	8	5	5	?	4	10	5	51†
Briars (26)	8	4	2	10	10	8	9	2	10	10	73
Mullien (27)	4	4	2	4	3	4	?	2	4	5	32†
Wild Cotton, M'k W'd (28)	6	8	10	2	4	4	8	2	2	4	50
Wild Parsnip (29)	6	10	6	4	6	8	?	2	6	8	56†
Indian Hemp (30)	5	6	10	4	4	6	7	5	6	6	59
Poke Weed (31)	6	4	2	6	4	4	20	1	6	4	57
Teasle (32)	4	4	4	6	4	10	?	5	6	10	55†
Golden Rod (33)	10	6	6	4	4	4	7	2	4	5	52
Smart Weed (34)	6	10	2	4	4	4	?	2	2	6	40†
Horse Weed (35)	4	8	10	3	4	4	10	5	3	6	57
Wild Flax (36)	2	6	2	2	2	6	10	7	5	10	52
Indian Mallow (37)	2	4	2	2	2	4	?	2	2	8	28†
Fox-tail (38)	10	6	2	2	10	10	10	2	2	6	60
Crab Grass (39)	10	6	2	2	10	10	10	2	2	10	64
Elecampane (40)	2	8	10	4	4	4	?	2	4	4	42†
Stick Weed (41)	5	6	6	4	3	4	9	2	2	10	51
Corn Cockle (42)	3	5	2	0	2	5	?	2	2	10	31†
Beggar's Lice (43)	4	6	6	2	4	4	?	2	2	8	38†
Jimson Weed (44)	4	10	4	2	2	2	?	2	4	4	34†
Shepherd's Purse (45)	4	8	2	0	4	5	?	2	2	4	31†
Tar Weed (46)	5	3	2	4	4	6	?	6	5	6	41†
Wing Stem (47)	3	10	5	4	6	4	10	8	5	4	58†
Spiny Amaranth (48)	2	4	4	5	6	10	?	6	5	10	50†
Nigger Head (49)	3	4	3	2	6	10	?	2	4	10	44†
Tall Rag Weed (50)	6	6	3	3	4	4	?	4	5	4	39†

\*These figures refer back to the Tables of Worst Weeds on pp. 190-91.



## Weeds as Fodder for Stock.

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One of the questions asked of my observers was: "Do you consider any of your weeds good fodder, if so which, and for what animals."

In answer to this question 98 reporters treated it with silence, doubtless judging the question too absurd to require reply of any kind; 103 answered briefly "none;" while 70 stated positively that "Rag Weed<sup>88</sup> is good fodder for sheep if carefully and properly cured." The balance of the answers were scattered and will be found elsewhere in their place. A number stated some plant or plants that pigs or horses would eat, but I judge that they hardly consider these as actually falling under the head of fodders.

Cattle will not refuse to take both Buck Plantain<sup>159</sup> and the Common Plantain<sup>158</sup> along with the grass upon which they are browsing, neither will they refuse Broom Sedge,<sup>191</sup> Stick Weed,<sup>79</sup> and numerous others while these are young and fresh, but I doubt if they would thrive were they turned in upon any of these plants alone. I am sorry not to be able to state this positively, but our analyses have not yet reached these weeds.

Many weeds might be excellent fodder were it not for the bitter principles or milk and beef infecting substances that they contain. Some weeds actually refused outright in a green state by cattle, are eaten readily when they are properly cured with the hay, yet they can hardly be classed as fodders, for cattle could not thrive on them alone. Horses are known to be fond of nibbling at or even eating quite a quantity of Wild Lettuce,<sup>113</sup> Iron Weed,<sup>72</sup> Oak leaves, Briars,<sup>45</sup> Burdock<sup>104</sup> or Hickory leaves; and I saw a cow last summer deliberately walk up to a Jimson Weed<sup>135</sup> and eat several mouthfuls of the leaves with evidence of pleasure at her taste; yet we would not class these plants as proper animal food.

It is a well known fact that animals often seek in the plants that surround them the remedies needed for their slight ailments, evidencing a reasoning power far beyond their supposed intelligence. Some act of this sort—like the cow and the Jimson Weed,—might mislead some into the supposition that such chosen plant was considered by the animal to be good fodder.

Some Wild Grasses and plants of our forests are really excellent food for cattle, prominent among them the Wild Pea Vine (137) and Deer Tongue Grass. There are some sections of the State where the woods abound in these and other natural foods rich in

nitrogen, whereon cattle flourish excellently well; but these plants can hardly be called weeds as very few of them ever show the least tendency to intrude upon the cultivated soils of the farm.

As to the question of carefully cured Rag Weed<sup>88</sup> being good fodder for sheep, in which so many of my correspondents concur: I can readily understand this weed to be a good fodder, for sheep seem by nature to require considerable bitter substance for their health and well being; and Rag Weed shows at the same time by the analysis of our Chemist a large per cent. of nutritive substances, in fact nearly as much as the average Timothy Hay. In point of fact, if Timothy Hay was worth \$10 per ton as fodder for sheep, Rag Weed would be worth \$8.25 for the same purpose. This would hardly prove true in case of other animals, unless it might be for steers whose beef was not intended for market at the time of such feeding. I noticed upon several farms in Randolph County last season a large number of dark colored stacks in fields where there were also a number of stacks of hay. Upon examination, I found these to consist almost exclusively of Rag Weed, and upon inquiry as to its use was told by the farmer that he always cut and carefully cured the Rag Weed of his stubble fields and stacked it in his sheep pastures near his hay; and further added that often sheep would remain at the Rag Weed stacks for days at a time utterly ignoring the presence of the hay.

One of my correspondents states in good faith that "Ox-eye Daisy"<sup>99</sup> is better fodder for cattle than Clover if cut when in bloom." We must differ with this statement, for it is known not even to be as good, for if clover was worth \$20 per ton, Ox-eye Daisy would only bring \$14.90 at the same rating. Then again as a matter of taste, if he should buy a ton of each for his cattle and allow them free access to both, his \$20 hay would be all gone before the Ox-eye Daisy was touched, and the cattle would be apt to wait until they were sure no more clover was forthcoming before they would even look at the cheaper article. I would not grow Ox-eye Daisy upon any such statement as that of my correspondent, nor would you upon my statement of its nutritive value as compared with clover. The Ox-eye Daisy is a weed; it has been proven to be the worst weed in the State, that is enough to settle the fact that it is worse than useless to us.

Ox-eye Daisy might be worth something as fodder if we could import it from some country at the other end of the earth, properly cured, and all the seed guaranteed to be positively dead.

Our Chemist has analyzed other weeds to determine their nutritive value, all of which will be found in Part 3 of this Bulletin under the consideration of the weeds themselves.

There is no doubt but that these careful analyses that we are now instituting at this Station might show a few weeds to be passable fodder. I will conclude, however by stating positively that there is not a weed in this State worth cultivating as fodder for stock.

## The Use of Chemicals as Weed Exterminators.

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In answer to my question: "Do you ever use any chemical or like remedy against weed growth, if so, what, and for what weeds?" One hundred and eighty-five correspondents answered "No," and sixty-five left the question unanswered.

Among the specific answers, most of the reporters mention the use of salt to kill Elders, Dock, Iron Weed, Plantain, Canada Thistle, Ox-eye Daisy and Cinquefoil; while one stated positively that "salt will not kill Docks." Salt may be used for this purpose in four ways (1) By cutting off the larger plants at the summit of the root a few inches beneath the ground and throwing in the cavity so made a large handful. If this is thoroughly and carefully done, I can easily understand that it might prove very effective indeed. (2) By sowing salt freely about over the weedy spots after surface cutting the growth. This method might kill some weeds, but can not prove satisfactory in general. (3) By proceeding as before, but turning in stock to feed where the salt was strewn, this would probably benefit the stock, but would generally fail to kill the perennial weeds. (4) By pouring cold or hot brine upon the cut ends of weeds or their roots. In this case, if the soil was quite loose and the method thoroughly carried out, it might prove very effective indeed. Salt will certainly kill vegetation, but it must be used in great quantity and would therefore be applicable only to very limited areas indeed.

Lime used profusely has often met with partial success as a weed exterminator. Its use on weeds growing in soils known to be lacking in that element would serve a double purpose as the weeds would be of a nature to be most badly effected by its use; while the land would be thereby improved for crops needing it.

The use of coal oil or kerosene as a weed exterminator can not be recommended as it will prove too costly, and at the same time only effective when poured liberally upon small areas of soil.

Sulphuric Acid will kill any weed of no matter of what nature, yet strong as it is, it must be applied directly to each individual root-stock whose eradication is desired, thus rendering the process a tedious and costly one. The Sulphates of metals, like sulphate of zinc, (white vitriol), sulphate of copper (blue vitriol), etc., might be used in the same way, and prove efficacious, but the cost is to be considered.

Experience and experiment have conclusively proven that any extended use of chemicals as weed killers is always attended by more expense and labor than the results can possibly compensate for.

Table 1—Valley Counties.

COUNTY.	OBSERVER.	Jefferson.	Berkeley.	Morgan.	Hampshire.
Blue Thistle <sup>125</sup>	5	62		175	4
Glenn-weed <sup>15</sup>	2	67	1		5
Canada Thistle <sup>108</sup>	3	79	3		3
Field Garlic <sup>178</sup>	2	117	2	4	4
Ox-Eye Daisy <sup>99</sup>	1	155	5		1
Naked-weed <sup>112</sup>	3	199	3	2	1
Water Cress <sup>11</sup>	1	Au- thor.	4		3
Sorrel <sup>168</sup>	2	1	5		4
Wild Carrot <sup>59</sup>				3	5
Dog Fennel <sup>197</sup>	2		1		2
Boar Thistle <sup>105</sup>			3		1
Burdock <sup>104</sup>			5		2
Wild Parsnip <sup>62</sup>		1			3
Corn Cockle <sup>20</sup>			8		1
Wild Poppy <sup>8</sup>			2		2
Spanish Needles <sup>65</sup>			3		3
Buck Plantain <sup>159</sup>			6		2
Yarrow <sup>98</sup>			7	3	3
Wild Flax <sup>138</sup>			2		4
Bitter Dock <sup>167</sup>				1	2
Nigger Head <sup>61</sup>					1
Smart-weed <sup>169</sup>				4	4
Teasle <sup>70</sup>					6
Sweet Clover <sup>39</sup>	9	10			5
					4

Table 1—Valley Counties.—Continued.

COUNTY.	OBSERVER.	Hardy.	Mineral.	Grant.	Pendleton.
Blue Thistle <sup>125</sup>	44 156 239	1 3 4	46 61 161 232	45 144 165 188 192 242 272 284	70 268
Glenn-weed <sup>15</sup>					
Canada Thistle <sup>108</sup>	1			4	
Field Garlic <sup>178</sup>					
Ox-Eye Daisy <sup>99</sup>	2 5 2		3 2 1	2 2 1 1 1 1 1	2 2 2
Naked-weed <sup>112</sup>					
Water Cress <sup>11</sup>					
Sorrel <sup>168</sup>			1		
Wild Carrot <sup>39</sup>				6	1
Dog Fennel <sup>97</sup>	4			3	1
Boar Thistle <sup>105</sup>				2	5
Burdock <sup>104</sup>					
Wild Parsnip <sup>62</sup>				3	3
Spanish Needles <sup>95</sup>	3			5	
Buck Plantain <sup>159</sup>		3	2	1	
Yarrow <sup>98</sup>		5		7	
Wild Flax <sup>138</sup>	4			8	
Teasle <sup>10</sup>	2		4	4	
Broom Sedge <sup>101</sup>	5				
Cinquefoil <sup>147</sup>		1			
Jimson Weed <sup>135</sup>			2 4		
Wild Sweet Potato <sup>137</sup>			5 4		
Cockle Bur <sup>90</sup>			1 4		3
Sweet Clover <sup>39</sup>				5	2

Table 2.—Northeastern Mountain Counties.

COUNTY.	OBSERVER.	Wild Flax <sup>138</sup>	Yarrow <sup>98</sup>	Spanish Needles <sup>95</sup>	Buck Plantain <sup>159</sup>	Broom Sedge <sup>191</sup>	Bitter Dock <sup>107</sup>	Blue Thistle <sup>125</sup>	Ox-eye Daisy <sup>99</sup>	Wild Carrot <sup>59</sup>	Burdock <sup>104</sup>	Cinquefoil <sup>47</sup>	Sorrel <sup>168</sup>	Rag Weed <sup>88</sup>
Tucker.	Author.	195 222 263	1 2 3 4 5	1 1	3 3	4 4 4	2	3 2	1 3	3 2				
Randolph.	Author.	88 99 198 269	1 4 2 2 2 2	4	5 1 3	3 3 4		1	2 3 1 1		2		3 4	5

Table 3—Eastern Mountain Counties.

Monroe.	Summers.	Greenbrier.	Pocahontas.	Webster.	COUNTY.	OBSERVER.
85	19	30	139	64	Broom Sedge <sup>191</sup>	1
145	55	142	151	246	Buck Plantain <sup>159</sup>	4
158	80	152		Author	Yarrow <sup>98</sup>	2
214	100	160	3		Ox eye Daisy <sup>99</sup>	3
219	244	210	3		Sand Briar <sup>132</sup>	4
	Author	218			Spanish Needles <sup>95</sup>	2
	5	223			Sorrel <sup>168</sup>	3
		Author			Cinquefoil <sup>47</sup>	
					Dog Fennel <sup>97</sup>	
					Bitter Dock <sup>167</sup>	
					Blue Thistle <sup>125</sup>	
					Blue Devil <sup>80</sup>	
					Rag Weed <sup>88</sup>	
					Burdock <sup>104</sup>	
					Wild Carrot <sup>59</sup>	
					Canada Thistle <sup>108</sup>	
					White Devil <sup>9</sup>	
					Teasle <sup>70</sup>	
					Beggar's Lice <sup>41</sup>	
					Wild Sw't Potato <sup>127</sup>	
					Nigger Head <sup>91</sup>	

Table 4--Northern Counties.

COUNTY.	OBSERVER.	Common Thistle <sup>105</sup>	Elders <sup>106</sup>	Bitter Dock <sup>167</sup>	Ox-Eye Daisy <sup>89</sup>	Rag Weed <sup>88</sup>	Yarrow <sup>98</sup>	Burdock <sup>104</sup>	Wild Carrot <sup>59</sup>	Teasie <sup>70</sup>	Buck Plantain <sup>159</sup>	Garlic <sup>178</sup>	Broom Sedge <sup>191</sup>	Iron Weed <sup>172</sup>	Cinquefoil <sup>17</sup>	Wild Sweet Potato <sup>27</sup>	Briars <sup>45</sup>
Preston.	17	1	2	3													
	37			3	4			2									
	58				2				1	3							
	93				1						2						
	109		3	4	1				2	2							
	110	5			2				6	6	1	3	4				
	127	3	4		1				2	2							
	148	4	2	1	1				2	2							
	157	5	2		1			3	4								
	187	2									3			1			
	196		3	4	1		5		2								
	217	4		2			1				3						
	262				3	1					2						
	Author.			3	1		2		4				5				
Monongalia.	10					1	4		2		3						
	48				1								2				
	Author.				1	8	6		4	5	3		2	7			
Marion.	2		3		1								4		2		
	11		1	3										2			5
	27		1		3						2		6	4			
	29		4	4	1		6				5		5	3			7
	43													2			1
	94							5			3		1	2		3	
	115			2	1			5			4			3		4	
	120			4	1					3				2			
	205		1	2			3				4						
	259		4	3	1										2		
	271		3	4										2	1		
	276		1	3		1		4		5			3	2	2		
		Author.															
Taylor.	83				2		7		3	6	4		5				1
	181			4			5		2		3		1				
	220				1		2		5		3		4				
	243				1		4		2		5		3				
	261				1		4		3				2				
	Author.				2				1	4			3				
Total.....		6	13	18	25	4	15	4	14	10	12	1	17	12	1	2	4



Table 5—Northwestern Ohio River Counties.

OBSERVER.	Hancock	Brooke.	Ohio.	Marshall.	Wetzel.	Tyler.
Golden Rod <sup>77</sup>	1 3	9 18 164 193 250	16 54	49 50 107 111 131 138 234	14 21 33 59 60 69 123 124 162 179 237	112 204
White Top <sup>82</sup>	2 4		1 1	1 3	1 5	5 2
Sorrel <sup>108</sup>	3 1		3	3 3		1 4
Wild Flax <sup>138</sup>	4 1			2		
Yarrow <sup>98</sup>	5 5	2 3 3		4 4 5 4 2	3 4 4 6	
Wild Carrot <sup>59</sup>		2 1 1 2		2		7
Canada Thistle <sup>108</sup>	2	1 3 4	5	5 4 2	3 1 7 6 2 2 2 1 3	
Bitter Dock <sup>167</sup>	3			1 1 3	3 3 2 2 1 3	3
Elders <sup>66</sup>		4 2 1		3	3 5 6 3 2	
Common Thistle <sup>105</sup>		1 2 4 6 5	3 2		2 2 2 6	
Teasle <sup>70</sup>				1 3 2	6 4	6
Briars <sup>43</sup>						
Sand Briar <sup>132</sup>		2 3				
Ox-eye Daisy <sup>99</sup>		3 4 5	2	2		
Broom Sedge <sup>181</sup>						
Buck Plantain <sup>159</sup>						
Rag Weed <sup>88</sup>			4		5 6 6	5 5
Wild Sw't Potato <sup>127</sup>			6 4	3 6 1 4		4 1
Spanish Needles <sup>95</sup>				1		
Burdock <sup>104</sup>					2 2	6 5
Cockle-bur <sup>90</sup>					4 1 2 1	
Iron Weed <sup>72</sup>					5	
Blue Devil <sup>80</sup>					4	
Dog Fennel <sup>97</sup>					1 5 3 3 5	
White Devil <sup>79</sup>						

Table 5—Northwestern Ohio River Counties.—Continued.

Wood.	Pleasants.	COUNTY.	OBSERVER.
1	197		Golden Rod <sup>77</sup>
28	211		White top <sup>82</sup>
31			Sorrel <sup>108</sup>
53			Wild Flax <sup>138</sup>
57			Yarrow <sup>98</sup>
74	5		Wild Carrot <sup>59</sup>
89	2	I	Canada Thistle <sup>108</sup>
101			Bitter Dock <sup>107</sup>
104			Elder <sup>66</sup>
118			Common Thistle <sup>105</sup>
203			Teasle <sup>70</sup>
206			Briars <sup>45</sup>
209			Sand Briar <sup>132</sup>
228			Ox-eye Daisy <sup>99</sup>
258			Broom Sedge <sup>91</sup>
Author.			Buck Plantain <sup>159</sup>
			Rag Weed <sup>88</sup>
			Wild Sw't Potato <sup>127</sup>
			Spanish Needles <sup>95</sup>
			Burdock <sup>104</sup>
			Cockle-bur <sup>90</sup>
			Iron Weed <sup>72</sup>
			Blue Devil <sup>86</sup>
			Dog Fennel <sup>97</sup>

Table 6—Southern Ohio River Counties.

COUNTY.	OBSERVER.	Jackson.	Mason.	Cabell	Wayne.
Bitter Dock <sup>167</sup>	8 15 51 72 75 121 140 200 201 215 224 256 273 Au- thor.	1 2 2 2 2 3 3 1 1 2 6 2 3 3 3 3 3	25 170 172 Au- thor.	82 194 229	86 98 178 267
Wild Sweet Potato <sup>127</sup>					
Broom Sedge <sup>191</sup>					
Buck Plantain <sup>159</sup>					
Blue Devil <sup>80</sup>					
Cockle-bur <sup>90</sup>					
Wild Carrot <sup>59</sup>					
Ox-Eye Daisy <sup>99</sup>					
White Top <sup>82</sup>					
Sand-briar <sup>132</sup>					
Common Thistle <sup>105</sup>					
Spanish Needles <sup>95</sup>					
Elders <sup>66</sup>					
Sorrel <sup>168</sup>					
Wing Stem <sup>95</sup>					
Tall Rag Weed <sup>87</sup>					
Wild Lettuce <sup>113</sup>					
Morning Glory <sup>136</sup>					
Cinquefoil <sup>87</sup>					
Iron Weed <sup>72</sup>					
White Devil <sup>79</sup>					
Dog Fennel <sup>97</sup>					
Teasel <sup>78</sup>					

Table 7—Northern Central Counties.

Lewis.	Upshur.	Doddridge.	Harrison.	Barbour.	COUNTY.
39	12	38	3	56	OBSERVER.
40	34	103	20	122	Elders <sup>66</sup>
125	114	163	22	168	Bitter Dock <sup>167</sup>
173	207	182	26	180	Teasle <sup>70</sup>
186	238	182	36		Sand-briar <sup>132</sup>
Author.	241	251	41		Broom Sedge <sup>191</sup>
	249	260	42		Wild Carrot <sup>99</sup>
	Author.		63		Yarrow <sup>98</sup>
2	4		73		Ox-eye Daisy <sup>99</sup>
2	5		87		Cockle-bur <sup>90</sup>
5	3		90		Buck Plantain <sup>159</sup>
3	2		95		Field Garlic <sup>178</sup>
3	1		102		Wild Sw't Potato <sup>127</sup>
3	4		102		Burdock <sup>104</sup>
3	3		252		Briars <sup>45</sup>
3	1		275		Canada Thistle <sup>108</sup>
5	2		Author.		Spanish Needles <sup>95</sup>
	3				Iron Weed <sup>72</sup>
	2				Common Thistle <sup>105</sup>
	2				Rag Weed <sup>88</sup>
	4				Blue Devil <sup>80</sup>
	3				White Devil <sup>70</sup>
					Sorrel <sup>168</sup>
					Dog Fennel <sup>97</sup>



Table 8—Southern Central Counties.

Lincoln.	Fayette.	Nicholas.	Clay.	Kanawha.	Putnam.	COUNTY.	OBSERVER.
24	106 130 132 Author	189 Author	254	84 143 154 174 191 Author	32 116 212 227 Author		
1	3	2 3		1	1	Ox-eye Daisy <sup>99</sup>	
4	1 1 3 3		3	3 4	2 3 2 5 5	White Devil <sup>79</sup>	
				3	1	Broom Sedge <sup>191</sup>	
					4	Wild Carrot <sup>50</sup>	
					1	Common Thistle <sup>105</sup>	
					2	Cinquefoil <sup>47</sup>	
					4	Yarrow <sup>98</sup>	
3	6	1		4	5	Cockle-bur <sup>99</sup>	
	2 4			2	6	Dog Fennel <sup>97</sup>	
				1	5	Spanish Needles <sup>95</sup>	
					6	Wing Stem <sup>93</sup>	
	1	4			7	Iron Weed <sup>72</sup>	
			2	3	4	Blue Devil <sup>180</sup>	
2			1	2		Elders <sup>66</sup>	
				1		White Devil <sup>79</sup>	
				2		Sand brier <sup>132</sup>	
		2	4	1		Sorrel <sup>168</sup>	
	5 2 3	1 3		7		Buck Plantain <sup>169</sup>	
	1					Rag Weed <sup>88</sup>	
5							

Table 9—Southern Boundary Counties.

COUNTY.	OBSERVER.	Ox-eye Daisy <sup>99</sup>	Yarrow <sup>98</sup>	Buck Plantain <sup>159</sup>	Broom Sedge <sup>191</sup>	Spanish Needles <sup>95</sup>	Sorrel <sup>168</sup>	Bitter Dock <sup>167</sup>	Cinquefoil <sup>47</sup>	Wild Carrot <sup>39</sup>	Sand briar <sup>132</sup>	Cockle-bur <sup>90</sup>	White Top <sup>83</sup>
Raleigh.	141 150 208	1 2	2 4	3 5	4 1 3	3 1	2	5 6 4					
Mercer.	81 97 129 264 270	5 4 3 2 2	1  3		4  4	2 5 4	3 1 1 1		2  2	6 3  3	4 6	7 5 7 1	
McDowell.	169	3			2	6				4		7	1

**Table 10—Summary of the Worst Weeds, According to the Tables.**

The following weeds were *noted worst* the number of times set opposite their names:

Ox-eye Daisy <sup>99</sup>	55	Rag Weed <sup>58</sup>	5
Broom Sedge <sup>191</sup>	30	Burdock <sup>101</sup>	4
Wild Carrot <sup>59</sup>	22	Canada Thistle <sup>108</sup>	3
Blue Thistle <sup>125</sup>	19	Field Garlic <sup>178</sup>	3
Sand-briar <sup>122</sup>	15	Dog Fennel <sup>97</sup>	3
Elders <sup>66</sup>	14	Golden Rod <sup>77</sup>	3
Blue Devil <sup>50</sup>	14	Common Thistle <sup>105</sup>	3
Yarrow <sup>98</sup>	13	Wild Flax <sup>128</sup>	2
Sorrel <sup>168</sup>	12	Teasle <sup>70</sup>	2
Buck Plantain <sup>159</sup>	11	Wing Stem <sup>93</sup>	2
Bitter Dock <sup>167</sup>	9	Glenn Weed <sup>15</sup>	2
Briars <sup>45</sup>	8	Water Cress <sup>11</sup>	2
White Devil <sup>78</sup>	7	Wild Sweet Potato <sup>127</sup>	1
Spanish Needles <sup>95</sup>	5	Cinquefoil <sup>47</sup>	2
Cockle-bur <sup>90</sup>	5	Smart Weed <sup>169</sup>	2
White Top <sup>82</sup>	5	Iron Weed <sup>72</sup>	1

The following is a complete list of weeds reported as BAD, with the number of times each was so reported:

Ox-eye Daisy <sup>99</sup>	147	Common Thistle <sup>105</sup>	18
Broom Sedge <sup>191</sup>	145	White Devil <sup>79</sup>	14
Wild Carrot <sup>59</sup>	97	Field Garlic <sup>178</sup>	14
Yarrow <sup>98</sup>	94	Cinquefoil <sup>47</sup>	11
Buck Plantain <sup>159</sup>	73	Wild Flax <sup>128</sup>	9
Bitter Dock <sup>167</sup>	66	Glenn Weed <sup>15</sup>	8
Sand briar <sup>122</sup>	64	Wild Parsnip <sup>62</sup>	8
Spanish Needles <sup>95</sup>	61	Wing Stem <sup>93</sup>	7
Elders <sup>66</sup>	53	Naked Weed <sup>112</sup>	5
Cockle bur <sup>90</sup>	53	Golden Rod <sup>77</sup>	5
Blue Devil <sup>50</sup>	46	Water Cress <sup>11</sup>	4
Blue Thistle <sup>125</sup>	45	Boar Thistle <sup>105</sup>	3
Wild Sweet Potato <sup>127</sup>	37	Corn Cockle <sup>20</sup>	2
Teasle <sup>70</sup>	33	Wild Lettuce <sup>113</sup>	2
Sorrel <sup>168</sup>	31	Beggar's Lice <sup>41</sup>	2
White Top <sup>82</sup>	28	Nigger Head <sup>91</sup>	2
Dog Fennel <sup>97</sup>	27	Jimson Weed <sup>135</sup>	2
Iron Weed <sup>72</sup>	25	Smart Weed <sup>169</sup>	2
Canada Thistle <sup>108</sup>	22	Wild Poppy <sup>8</sup>	1
Briars <sup>45</sup>	20	Sweet Clover <sup>38</sup>	1
Rag Weed <sup>58</sup>	20	Tall Rag Weed <sup>89</sup>	1
Burdock <sup>101</sup>	19	Morning Glory <sup>126</sup>	1





