Minnesota State Horticultural Society Records.

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SUPPLEMENT TO

The Minnesota Horticulturist.

VOL. 22. APRIL, 1894. NO. 3.

FRUIT LIST

RECOMMENDED BY THE MINNESOTA STATE HORTICULTURAL SOCIETY FOR PLANTING IN MINNESOTA.

(Adopted at the annual meeting of the Minnesota State Horticultural Society, January 12, 1894.)

APPLES.

Hardiest apples for planting in Minnesota: Duchess, Hibernal.

For planting in favorable locations: Wealthy, Longfield.

For general trial: Patten's Greening, Peerless, Okabena, Hotchkiss, Anisim, Charlamoff, Kaump, Arabian.

Crabs and hybrids for general cultivation: Virginia, Martha, Whitney, Transcendent, Early Strawberry, Briar's Sweet, Minnesota, Hyslop.

Crabs and hybrids for trial: Tonka, Dartt's Hybrid, Faribault, Greenwood, Arctic, Gideon's No. 6.

PLUMS.

For general cultivation: Desota, Rollingstone, Wolf River, Forest Garden, Weaver.

For trial: Rockford, Owatonna, Ocheeda.

GRAPES.

For general cultivation: Concord, Delaware, Moore's Early, Worden, Janesville, Brighton, Cottage.

RASPBERRIES.

For general cultivation: Red—Turner, Cuthbert, Marlboro, Brandywine. Black—Ohio, Souhegan, Nemaha, Gregg, Shaffer.

For trial: Older, Palmer, Kansas.

BLACKBERRIES.

For general cultivation: Ancient Briton, Snyder.

CURRANTS.

For general cultivation: Red Dutch, White Grape, Victoria, Stewart, Long Bunch Holland.

GOOSEBERRIES.

For general cultivation: Houghton, Downing.

STRAWBERRIES.

For general cultivation: Crescent, Warfield, Haverland, Bubach No. 5, Bederwood, Capt. Jack, Parker Earle, Wilson.

Minnesota, would be immensely the gainer by becoming a member.

LIFE MEMBERSHIP.

The Life Membership fee is $10.00, payable in two annual installments of $5.00 each, if preferred. Life members are entitled to all the privileges of the society, including its publications, during life; and to a file of the back reports as complete as possible, some twenty volumes, constituting an invaluable horticultural library.

Address communications and remittances to the Secretary.

OFFICERS FOR 1895.

(Any of the officers will willingly answer inquiries in regard to the work of the Society.)

President, J. M. UNDERWOOD, Lake City.

Vice Presidents,

First Cong. Dist.—E. H. S. DARTT, Owatonna.
Second " —S. D. RICHARDSON, Winnebago City.
Third " —MRS. A. A. KENNEDY, Hutchinson.
Fourth " —R. S. MACKINTOSH, Langdon.
Fifth " —COL. J. H. STEVENS, Minneapolis.
Sixth " —J. O. BARRETT, Browns Valley.
Seventh " —MRS. JENNIE STAGER, Sauk Rapids.

Secretary, A. W. LATHAM,
Office and library, 207 Kasota Block, Minneapolis, Minn.
(*Office hours of the Secretary from 9 to 12 A. M. on Tuesday, Thursday and Saturday.*)

Treasurer, DITUS DAY, Farmington.

Executive Committee,
(President and secretary are members ex-officio.)
Chairman, WYMAN ELLIOT, Minneapolis.—3 years.
J. S. HARRIS, La Crescent.—3 years.
PROF. S. B. GREEN, St. Anthony Park.—2 years.
CLARENCE WEDGE. Albert Lea.—2 years.
J. P. ANDREWS, Faribault.—1 year.
L. R. MOYER, Montevideo.—1 year.

Librarian, A. W. LATHAM, Minneapolis.

Ass't Librarian, E. A. CUZNER,
Essex and 27th Avenue S. E. Minneapolis.

PLEASE READ CAREFULLY

and hand to some one interested in horticulture.

1895.

MINNESOTA STATE

Horticultural Society.

Organized 1866.

President, J. M. UNDERWOOD, Lake City, Minn.

Secretary, A. W. LATHAM.

Office (and society library), 207 Kasota Block.
MINNEAPOLIS, MINN.

Active membership for year ending Jan. 7, 1895.

567.

This society publishes monthly a magazine of forty pages, entitled

The Minnesota Horticulturist,

Edited by the Secretary.

Subscription Price, including membership in the society, the report of the society for 1894 (538 pages) and (to new members) three horticultural premiums, $1.00 per annum. Life membership fee, $10.00.

Remit to the Secretary.

THE OBJECT OF THE SOCIETY.

THE MINNESOTA STATE HORTICULTURAL SOCIETY, incorporated under the laws of the state, has for its work the accumulation and distribution of horticultural knowledge relating to forestry, fruit and vegetable growing, the culture of flowers, etc. It is not a money making institution and has no other purpose than as defined above.

The present working membership of the society consists of over five hundred of the most active and wide-awake professional and amateur horticulturists throughout the Northwest.

This society holds annual summer and winter meetings, at which fruits, vegetables, flowers, etc. are exhibited, papers and reports are read on horticultural topics, and the personal opinions of the members secured in the discussions which follow.

The annual winter meeting of four days is an event of great interest, and the published reports which follow reflect with accuracy the condition of horticulture throughout the state.

Some twenty different committees, selected from the members, have special charge of investigations in the various branches of horticulture, and a dozen experiment stations in different parts of the state, under the charge of members, are making practical tests of everything new and desirable. The reports made by these committees and by the superintendents of the experiment stations, along with the papers and discussions and other information of value, are compiled and printed at the expense of the state. The society receives also from the same source a small annual appropriation to assist in carrying on its work.

THE REPORT is issued as a monthly magazine, entitled,

"THE MINNESOTA HORTICULTURIST."

At the close of the year the twelve magazines are bound together as the Annual Report of the Society for distribution, postpaid without extra charge, to members at the beginning of the next year.

Subscription price of this magazine, which includes membership in the society and all its privileges, is $1.00 per annum.

All subscriptions to this magazine *expire with the January* number, and all numbers for the current year issued prior to the date of subscription will be sent free postpaid.

Our magazine year this year begins with the February No.

ALL SUBSCRIBERS for 1895 are entitled to receive, postpaid, a handsome cloth bound copy of the Report of the Minnesota State Horticultural Society for 1894, containing the twelve numbers of "The Minnesota Horticulturist" for 1894, the journal of the last annual meeting of the society, list of members and other papers of value, index, &c.—in all 538 pages.

N. B. It is understood that the subscribers for 1894, on receipt of this volume, will distribute among their acquaintances the magazines received in 1894.

NEW SUBSCRIBERS for 1895, besides the above described volume, are entitled to select *three* premiums from the following list:

LIST OF PREMIUMS.

No. 1. One Aminia (Rogers, No. 39) grape vine.
" 2. One Brighton grape vine.
" 3. One Lady grape vine.
" 4. Six Older raspberry (black) plants.
" 5. Six Golden Queen raspberry (yellow) plants.
" 6. One buffalo berry.
" 7. One rose plant, Chlotilde Soupert.
" 8. One Hydrangea Paniculata Grandiflora shrub.
" 9. Two Smith's Improved gooseberry plants.
" 10. Two Downing gooseberry plants.

Please select by the numbers and notify the secretary at the time of sending the subscription. They will be sent free by mail at the proper season.

Address: A. W. LATHAM, Secretary.
207 Kasota Block, Minneapolis, Minn.

THUS FOR ONE DOLLAR

A New Member may have

1. **A MONTHLY HORTICULTURAL MAGAZINE** of great practical value—40 pages.
2. **A MEMBERSHIP IN THIS SOCIETY FOR ONE YEAR.**
3. **A CLOTH BOUND VOLUME OF 538 PAGES**—the last year's report.
4. **THREE PREMIUMS OF PLANTS &c.,** adapted to the climate, and worth alone more than the price of the subscription.

ANY PERSON SENDING THREE NEW MEMBERS is entitled to receive, postpaid, the magazine, the volume and the three premiums as described above. Also, if desired, **three back reports,** including 1894, by express.

YOU CAN EASILY SECURE THESE!

The *society should include in its membership* the name of every person in any way interested in horticulture. The expense is small, compared to the benefits received, and every person who buys or plants flowers, fruits, trees or vegetables in

Minnesota State Horticultural Society.

LIBRARY AND SECRETARY'S OFFICE,
207 KASOTA BLOCK.
(Cor. Fourth St. and Hennepin Ave.)
MINNEAPOLIS, MINN.

PRESIDENT, J. M. UNDERWOOD, Lake City. 1895 SECRETARY, A. W. LATHAM, Minneaaolis.

PUBLISHES A MONTHLY MAGAZINE, ENTITLED
"THE MINNESOTA HORTICULTURALIST"
Subscription, $1.00 per annum, including membership.

Library and Office of A. W. LATHAM, Sec'y,
207 KASOTA BLOCK.

Minneapolis, Minn., ... *1895.*

.....

DEAR SIR:—Your name has been handed me by an acquaintance of yours who considers you one likely to be interested in the work of the Minnesota State Horticultural Society. May I ask *your careful perusal* of the enclosed circular, which describes the objects and methods of the society, etc.? It is an association designed for the mutual good of every person belonging to it. The expense—$1.00 per year—is only nominal, as the state pays the expense of printing its reports, &c.

As a new member you would receive the value of your outlay several fold in the monthly magazine, the bound volume for 1894, the plant premiums and the general membership privileges.

Please send your name and one dollar for membership for 1895 without delay and get the benefit of what others know about fruit growing, &c. in our state. It will not pay you to try to discover this information all alone for yourself. Perhaps you have been trying to, already, at big expense—a good many have.

Yours very respectfully,

A. W. Latham, Secy.

207 Kasota Block, Minneapolis, Minn.

P. S. A sample copy of our monthly magazine will be sent you free on application, and also to any of your acquaintances likely to be interested in this subject. Please send me the names and addresses of all such and oblige.

Badge Book

ANNUAL MEETING

DEC. 5 TO 8, 1911

MINNESOTA STATE HORTICULTURAL SOCIETY

DIRECTIONS:--Wear conspicuously the badge and numbered button accompaning this book. The following list, alphabetically arranged, contains the names of all members, delegates or visitors in attendance at the meeting who are wearing numbered badges. By consulting this list, any one of them can be identified at once by the number on the badge. : : : : : : : : : : :

A

1 Aamodt, A. W., St. Anthony Park.
2 Adams, Lousia J., Minneapolis.
3 Akin, Robt. W., Anoka.
4 Anderson, G. A., Renville.
5 Anderson, Louis, Glastone.
6 Andrews, J. P., Faribault.
7 Arrowood, Jas., Nevis.
8 Ashby, H. M., Chicago.

B

9 Bailey, E. G., Northome.
10 Baillif, R. L., Minneapolis.
11 Baker, Geo. A., Janesville.
12 Baker, H. F., Minneapolis.
13 Baldwin, H. J., Northfield.
14 Beach, Prof. S. A., Ames, Ia.
15 Beebe, H. U., Lake City.
16 Benjamin, J. F., Hutchinson.
17 Benjamin, Mrs. J. F., Hutchinson.
18 Blain, H. J., Maple Plain.
19 Blain, Mrs. H. J., Maple Plain.
20 Blaker, Rev. C. D., Minneapolis.
21 Boardman, Mrs. H. A., St. Paul.
22 Born, Otto G., St. Paul.
23 Bove, Peter, Minneapolis.
24 Brackett, A., Excelsior.
25 Brevig, A. L., Starbuck.
26 Briard, F. W., Gaylord.
27 Briggs, Geo. A., Traverse.

28 Brown, Frank, Paynesville.
29 Brown, H. A., Brownsdale.
30 Brown, J. P., Excelsior.
31 Brunkow, Chas. A., Delano.
32 Bruns, Henry, Excelsior.
33 Bubak, Chas., Olivia.
34 Bull, Prof. C. P., St. Anthony Park.
35 Bull, Mrs. C. P., St. Anthony Park.
36 Bunnell, M. C., Newport.
37 Burnap, Col. W. A., Pelican Rapids.
38 Burton, Miss Hazel, Deephaven.
39 Butler, Miss Eloise, Minneapolis.
40 Butterfield, F. J., Long Lake.
41 Butterfield, Mrs. F. J., Long Lake.
42 Butts, F. C., Minneapolis.
43 Butts, Mrs. F. C., Minneapolis.

C

44 Cady, Prof. Le Roy, St. Anthony Park.
45 Calahan, H. E., St. Paul.
46 Campbell, E. R., St. Paul.
47 Campbell, Mrs. E. R., St. Paul.
48 Cashman, M. R., Owatonna.
49 Cashman, Thos. E., Owatonna
50 Cheney, John, Morton.
51 Cheney, W. H., Olivia.
52 Clausen, P., Albert Lea.
53 Clinton, Irving J., Watkins.
54 Clinton, Nicholas, Watkins.
55 Clinton, Mrs. Nicholas, Watkins.
56 Colling, Jas. H., Inkster, N. D.
57 Collins, L. W., Minneapolis.

58 Comstock, E. F., Minneapolis.
59 Cook, Dewain, Jeffers.
60 Cowles, F. J., West Concord.
61 Cox, W. T., St. Paul.
62 Crosby, S. P., St. Paul.
63 Cummins, John R., Minneapolis.

D

64 Davis, L. O., Minneapolis.
65 Deline, F. W., Leader.
66 Deline, W. F., Cannon Falls.
67 DeSmidt, A. A., Battle Lake.
68 Deuel, Harry J., White Bear. Lake.
69 Deuel, Mrs. Harry J., White Bear Lake.
70 Dickenson, W. C., Osseo.
71 Dickenson, Mrs. W. C., Osseo.
72 Dickman, E. J., West St. Paul.
73 Dixon, Jas. K., No. St. Paul.
74 Dorsey, M. J., St. Anthony Park.
75 Drew, Prof. Jas. M., St. Anthony Park.
76 Drew, Mrs. Jas. M., St. Anthony Park.
77 Drum, S. H., Owatonna.
78 Dunsmore, Henry, Olivia.
79 Durand, Albert, Waseca.

E

80 Eckman, C. M., Hendrum.
81 Eisenach, W. L., Deer River.
82 Eklof, John, Cokato.

83 Elliot, Wyman, Minneapolis.
84 Ellison, Miss Sabra M., Minneapolis.
85 Engel, Albert, Morgan.
86 Engman, Nels, Minneapolis.

F

87 Fink, Christian, Waconia.
88 Fink, Fred, Excelsior.
89 Flagstad, J., Sacred Heart.
90 Fletcher, F. F., Minneapolis.
91 Forcier, V. E., Stewart.
92 Forcier, Mrs. V. E., Stewart.
93 Fournelle, Peter, White Bear.
94 Fournelle, Mrs. Peter, White Bear Lake.

G

95 Gardner, Chas. F., Osage, Ia.
96 Garwood, E. C., Minneapolis.
97 Garwood, Mrs. E. C., Minneapolis.
98 Glyer, Alfred, Forest Lake.
99 Goodspeed, P. J., Minneapolis.
100 Greening, C. F., Grand Meadow.
101 Griffith, Wm., Princeton.
102 Griffith, Mrs. Wm., Princeton.
103 Groat, H. G., Anoka.
104 Gunderman, H., Wabasha.

H

105 Hall, D. S., Olivia.
106 Hall, Mrs. D. S., Olivia.

107 Hall, Thornton, W., Minneapolis.
108 Hall, Mrs. Thornton W., Minneapolis.
109 Hamnstrom, C. J., New Brighton.
110 Handy, A. M., Granada.
111 Hansen, Prof. N. E., Brookings, S. D.
112 Harris, Frank I., LaCrescent.
113 Harrison, F. M., Glenwood.
114 Harrison, Mrs. F. M., Glenwood.
115 Haralson, Chas., Excelsior.
116 Harrison, Jas. F., Excelsior.
117 Hart, W. H., Owatonna.
118 Haseltine, E. W., Minneapolis.
119 Hatcher, Frank, Wayzata.
120 Hatcher, Mrs. Frank, Wayzata.
121 Haynes, A. E., Minneapolis.
122 Hendricks, Chas. W., Spring Valley
123 Hermanson, Herman, Hopkins.
124 Herrick, U. G., Minneapolis.
125 Higbie, W. S., Eden Prairie.
126 Hilborn, E. C., Valley City, N. D.
127 Horton, W. H., Alexandria.
128 Horton, Mrs. W. H., Alexandria.
129 Hostetter, A. B., Duluth.
130 Hoverstad, A. T., Maynard.
131 Hoyt, B. T., St. Paul.
132 Hoyt, Mrs. B. T., St. Paul.
133 Huestis, Dr. O. M., Minneapolis.
134 Huestis, Mrs. O. M., Minneapolis.
135 Hunt, O. W., Lewiston.
136 Hunter, C. C., Minneapolis.
137 Husser, Henry, Minneiska.
138 Husting, L. P., Hastings.
139 Husting, Mrs. L. P., Hastings.

J

140 Jager, H. J., Owatonna.
141 Jager, Mrs. H. J., Owatonna.
142 Jager, John, Minneapolis.
143 Jager, Mrs. John, Minneapolis.
144 Jenson, C. M., Albert Lea.
145 Johnson, A. A., Winnebago.
146 Johnson, C. J., Pennock.
147 Johnson, Gust, Minneapolis.
148 Johnson, Mrs. Gust, Minneapolis.
149 Johnson, P. G., Minneapolis.
150 Jordan, J. J., Shakopee.
151 Jordan, Mrs. J. J., Shakopee.

K

152 Katzner, Rev. Jno. B., Collegeville.
153 Kellogg, Geo. J., Lake Mills, Wis.
154 Kellogg, M. S., Janesville, Wis.
155 Kenney, Dr. D. J., Minneapolis.
156 Kenney, Mrs. D. J., Minneapolis.
157 Kenney, Seth H., Waterville.
158 Ketchum, C. S., Henrietta.
159 Kimball, F. W., Austin.
160 Kinney, S. G., Faribault.
161 Kirk, Loren O., Minneapolis.
162 Kirkpatrick, Prof. K. A., St. Anthony Park.
163 Knowles, Mrs. M. A., Excelsior.
164 Knowlton, J. E., Excelsior.
165 Knowlton, Mrs. J. E., Excelsior.

166 Kohler, Prof. A. R., St. Anthony Park.
167 Kolisch, Aug., St. Louis Park.
168 Kolisch, Mrs. Aug., St. Louis Park.
169 Krinkey, Herman, Hutchinson.

L

170 Lange, Prof. D., St. Paul.
171 Larson, C. L., Winthrop.
173 Larson, Louis M., St. Louis Park.
174 Latham, A. W., Minneapolis.
175 Lee, E. G., St. Paul.
176 Lee, Mrs. E. G., St. Paul.
177 Lien, Thos. J., Delavan.
178 Long, A. G., Minneapolis.
179 Long, Mrs. A. G., Minneapolis.
180 Longfellow, D. W., Minneapolis.
181 Longfellow, Levi, Minneapolis.
182 Longyear, E. J., Excelsior.
183 Longyear, Mrs. E. J., Excelsior.
184 Lowe, J. W., Fairmont.
185 Ludescher, J. L., Rockford.
186 Ludwig, Mrs. F. B., Merriam Park.
187 Lundgren, Mrs. E. E., St. Paul.
188 Lyman, A. B., Excelsior.
189 Lyman, Mrs. A. B., Excelsior.

Mc

190 McCully, Preston, Maple Plain.
191 McCully, Mrs. Preston, Maple Plain.
192 McDonald, Wm. M., Excelsior.
193 McKisson, G. D., Fairmont.
194 McVeety, J. A., Howard Lake.
195 McVeety, Mrs. J. A., Howard Lake.

M

196 MacGillivery, N. D., Hopkins.
197 Mackintosh, R. S., Caledonia.
198 Magnusson, Sven, Harris.
199 Maher, John W., Devils Lake, N. D.
200 Mareck, Titus, Minneapolis.
201 Mareck, Mrs. Titus, Minneapolis.
202 Marsh, A. J., Argyle.
203 Marsh, F. L., Champlin.
204 Matzke, Sil, So. St. Paul.
205 Mayo, E. D., Minneapolis.
206 Merriam, L. O., Minneapolis.
207 Merriam, Mrs. L. O., Minneapolis.
208 Meyer, Wm. H., Waseca.
209 Miks, Rev. A., St. Michael.
210 Miller, E. B., Minneapolis.
211 Miller, Mrs. E. B., Minneapolis.
212 Mitchell, D. M., Owatonna.
213 Moore, Jas. G., Madison, Wis.
214 Moore, O. W., Spring Valley.
215 Moris, Frank, Lake Elmo.
216 Mosbaek, Ludvig, Askov.
217 Moyer, L. R., Montevideo.
218 Mueller, Paul L., Minneapolis.
219 Murray, J. W., Excelsior.
220 Myrah, E. G., Spring Grove.

N

221 Nelson, Anton, Grasston.
222 Nelson, John A., Maynard.
223 Newman, Dr. G. A., Stillwater.
224 Norberg, Theo. M., Victoria.

O

225 Odell, Mrs. Robt., Minneapolis.
226 Older, C. E., Luverne.
227 Older, F. E., Bottineau, N. D.
228 Oldenburg, Henry C., Carlton.
229 Oleson, Michael, Montevideo.
230 Olmstead, Rev. Rett E., Excelsior.
231 Olson, Peter M., Zumbrota.
232 Oredalen, Ole, Kenyon.

P

233 Pabody, E. F., Minneapolis.
234 Palmer, A. T., Minneapolis.
235 Palmer, C. A., St. Paul.
236 Palmer, Phebe E., Minneapolis.
237 Peck, C. M., Excelsior.
238 Peet, Wm., Minneapolis.
239 Penney, John, Cushing, Wis.
240 Perkins, Alfred G., St. Paul.
241 Perkins, T. E., Red Wing.
242 Perry, P. H., Excelsior.
243 Peterson, P. H., Atwater.
244 Peterson, R. M., St. Paul.
245 Peterson, Mrs. R. M., St. Paul.
246 Pfaender, Wm., Jr., New Ulm.
247 Pfeiffer, C. A., Winona.
248 Philips, A. J., West Salem, Wis.
249 Philips, Mrs. A. J., West Salem, Wis.
250 Pierce, C. A., New Richland.
251 Pollard, A. A., Minneapolis.

252 Pond, H. H., Minneapolis.
253 Pond, Mrs. H. H., Minneapolis.
254 Pond, I. W., Madelia.
255 Pond, Mrs. I. W., Madelia.
256 Poore, Hamlin, V., Bird Island.
257 Porter, J. E., Minneapolis.
258 Pyle, T. G., Stillwater.

R

259 Ramsdell, Chas. H., Minneapolis.
260 Redpath, Geo., Wayzata.
262 Redpath, Thos., Wayzata.
263 Reed, A. H., Glencoe.
264 Reeves, C. E., Minneapolis.
265 Reel, E. G. E., Excelsior.
266 Reid, E. W., St. Paul.
267 Remel, Casper, Menomonie, Wis.
268 Rhodes, J. E., St. Paul.
269 Richardson, A. W., Howard Lake.
270 Richardson, Mrs. A. W., Howard Lake.
271 Richardson, Ira E., New Brighton.
272 Richardson, Mrs. Ira E., New Brighton.
273 Richardson, S. D., Winnebago.
274 Robinson, Reubin, Champlin.
275 Robson, Mrs. J. J., Langdon, N. D.
276 Rosander, J. W., Wayzata.
277 Rowe, Chas., Wayzata.
278 Ruff, D. W. C., St. Paul.
279 Ruggles, Prof. A. G., St. Anthony Park
280 Russell, Mrs. Mary, Minneapolis.
281 Ryan, Timothy, Hopkins.
282 Ryan, Mrs. Timothy, Hopkins.
283 Rydeen, Arthur, Marietta.

S

284 Sahler, Emil, Waseca.
285 Sandbo, I. A., Wegdahl.
286 Sandvig, C. R., Belgrade.
287 Scammell, H. B., St. Anthony Park.
288 Schmidt, Dr. G., Sleepy Eye.
289 Schneider, Frank, Chaska.
290 Schwerin, Henry, Echo.
291 Schwerin, Mrs. Henry, Echo.
292 Schwyzer, Gustav, Minneapolis.
293 Seamons, Oscar, Excelsior.
294 Simmons, Harold, Howard Lake.
295 Simons, W. D., Minneapolis.
296 Simons, Mrs. W. D., Minneapolis.
299 Siverts, Peter, Canby.
300 Skotterud, E. O., Dawson.
301 Slocum, A. M., Excelsior.
302 Smith, E. A., Lake City.
303 Smith, F. C., Plum City, Wis.
304 Smith, L. W., St. Paul.
305 Snyder, C. E., Preston.
306 Snyder, Prof. Harry, St. Paul.
307 Snyder, S. W., Center Point, Ia.
308 Soholt, M., Madison.
309 Soholt, Mrs. M., Madison.
310 Speechly, H. M., Pilot Mounds, Man.
311 Sprague, Mrs. L. E. P., Minneapolis.
312 Stager, Mrs. Jennie, Sauk Rapids.
314 Steller, C. G., Excelsior.
315 Stewart, Rollin, Minneapolis.

316 Stewart, Prof. John T., St. Anthony Park.
317 Stockwell, S. A., Minneapolis.
318 Stockwell, Mrs. S. A., Minneapolis.
319 Strand, Geo. W., Taylors Falls.
320 Strand, Mrs. Geo. W., Taylors Falls.
321 Swanson, Peter, Excelsior.
322 Swanson, Mrs. Peter, Excelsior.
323 Swennes, Knute, Minneota.

T

324 Teigland, J. L., Minneota.
325 Thomsen, Th. I., Minneapolis.
326 Thomsen, Mrs. Th. I., Minneapolis.
327 Thorp, Col. Freeman, Hubert.
328 Tillotson, Mrs. H. B., Minneapolis.
329 Tingley, W. J., Forest Lake.
330 Tingley, Mrs. W. J., Forest Lake.

U

331 Underwood, Mrs. Anna B., Lake City.
332 Underwood, J. M., Lake City.
333 Underwood, Roy D., Lake City.

V

334 Valleau, W. D., St. Anthony Park.
335 Vandergon, D. D., Maple Lake.
336 Vierling, E. J., Shakopee.
337 Voigt, Louis H., Hastings.
338 Vollenweider, Henry, La Crescent.

W

339 Waldron, Prof. C. B., Fargo, N. D.
340 Walker, Chas. E., Glencoe.
341 Wampler, A. J., White Bear.
342 Wampler, Mrs. A. J., White Bear.
343 Wanlass, Jos., Mindora, Wis.
344 Ward, F. A., Fairmont.
345 Washburn, Prof. F. L., St. Anthony Park.
346 Weber, John, Murdock.
347 Weber, V., Murdock.
348 Webster, D. C., La Crescent.
349 Webster, Mrs. D. C., La Crescent.
350 Webster, Mrs. Mary P., Minneapolis.
351 Wedge, Clarence, Albert Lea.
352 Wedge, Mrs. Clarence, Albert Lea.
353 Wedge, Robt., Albert Lea.
354 Wendlandt, Wm., Waseca.
355 Westley, O. B., Cooperstown, N. D.
356 Westley, Mrs. O. B., Cooperstown, N. Dak.
357 Wheaton, D. T., Morris.
358 White, Miss Emma V., Minneapolis.
359 White, J. C., Mabel.
360 Whiting, Geo. H., Yankton, S. D.
361 Whiting, Mrs. Geo. H., Yankton, S. D.
362 Widmoyer, W. S., Dresbach.
363 Wille, F. W., St. Paul.
364 Willis, Rev. Francis, Excelsior.
365 Wilson, A. D., St. Anthony Park.
366 Wilson, Robt., Stillwater.

357 Winkley, F. C., Minneapolis.
368 Winkley, Mrs. F. C., Minneapolis.
359 Winter, T. G., Minneapolis.
370 Woodruff, C. O., Excelsior.
371 Wright, R. A., Excelsior.

Z

372 Zachritz, Geo. P., Excelsior.
373 Zachritz, Mrs. Geo. P., Excelsior.
375 Zachritz, Geo. P., Jr., Excelsior.
376 Zuercher, Fred, Excelsior.
377 Yahnke, W. A., Winona.
378 Yanish, Ed., St. Paul.

SUPPLEMENT

379 Averill, F. A., Minneapolis.
380 Eddy, W. H., Howard Lake.
381 Robertson, Lynn, St. Louis Park.
382 Elliot, S. D., Maple Plain.
383 Suderburg, Carl, Wayzata.
384 Gibbs, F. H., St. Anthony Park.
385 Gibbs, Mrs. F. H., St. Anthony Park.
386 Collins, P. V., Minneapolis.
387 Zimmerman, Jul, Minneiska.
388 Stoa, Martin, Albert Lea.
389 Spates, Mrs. S. R., Wayzata.
390 Klinkenberg, C. R., Minneapolis.
393 Moak, Mrs. M. A., Excelsior.

Ye HORTICULTURISTS DO DINE

1919

MENU

CREAM OF TOMATO

CELERY DILL PICKLES

MIGNON OF TENDERLOIN BEEF DIXIE

SPECIAL BAKED POTATOES

BROWNED CORN

HEART OF LETTUCE CREAM DRESSING

WHITE HOUSE ICE CREAM

CAKE

COFFEE

HORTICULTURAL BANQUET.

1 9 1 8.

Toastmaster, Prof. F. L. Washburn.

Grace ..... Rev. Chas. D. Blaker

1. a. America, first and fourth stanzas, page 28. All standing and singing.
   b. Song ..... Trafford N. Jayne
2. John Nordine. 'Tis easy to go with the wind but dusty—face the other way.
3. Reading ..... Mrs. Wm. Willing
4. Song. ..... Trafford N. Jayne
5. N. A. Rasmussen. "Why are we here? You tell."
6. Rev. Francis Jager, "The Red Cross in Serbia."
7. Battle Hymn of the Republic, page 29, verses 1, 4, 5. All standing and singing.
8. Prof. N. E. Hansen, "In the days of Moses and subsequently."
9. Reading ..... Mrs. Wm. Willey
10. Dean R. W. Thatcher. "Life is an opportunity—so is this toast."
11. Song ..... Trafford N. Jayne
12. Miss Maria L. Sanford. "The making of an American."
13. Song. "Auld Lang Syne." 1st verse, page 223. All standing and singing.

Return to S. B. Green.

1897

Hampden County Horticultural Society

Thirty-fifth Year.

1897.

The . . . Hampden County Horticultural Society . . . Annual . . .

SPRINGFIELD, MASS.

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HAMPDEN COUNTY HORTICULTURAL SOCIETY.

SECRETARY'S REPORT.

SPRINGFIELD, MASS., DECEMBER 4, 1896.

THIS closes the 35th year of the Hampden County Horticultural Society and marks unusual progress in the work of the society, scientifically as well as in the way of horticulture. The advances made in new varieties and improved forms of flowers of several types have been introduced at our exhibitions, thus giving us the opportunity of first showing to the world their merits.

Our sweet pea shows have a wide reputation, extending every where that this beautiful flower is cultivated and studied for improvement; the reports of these exhibitions are called for far beyond the borders of these United States.

While most of the new varieties are introduced from England, American growers, among them some of our members, have hybridized and put out new and improved varieties that have found a place among the best introductions.

The sweet pea exhibition, held July 28 and 29, was noted for the extent of territory from which it attracted growers, experts and artists. Much time was given to study of the flower from a seedsman's point, by representatives of some of the growers and by those who examined the flowers in comparison, from the artists view, and in the light of horticultural students.

Prizes for general collection were awarded to H. A. Jones, Worcester, Mass., first, and to Mrs. H. S. Hyde, Brush Hill Farm, West Springfield, for second best; this class had five entries.

The class for thirty vases had four entries. E. A. Weeks, Worcester, Mass., received the first award, W. A. Phelps of Lee, second, and F. A. Blake, Rochdale, third; all good flowers. W. J. Eldred's entry was of real merit but as there was but three offers in this class this collection received no notice. For fifty sprays, any named variety, Lemon Queen, by W. A. Phelps, received first prize, Blanche Ferry, second, grown by R. L. Persons, Mittineague, and

America, by E. C. Fenn, Ware, was third. Other entries in this class were by F. A. Blake, Bronze King; W. J. Eldred, Blanche Ferry; E. A. Weeks, America; H. A. Jones, Alice Eckford; A. H. Smith, Boreatton; L. D. Robinson, Boreatton and Mrs. H. S. Hyde, Blanche Ferry; eleven in all. The class for best white had seven entries. Emily Henderson, by L. D. Robinson, received first, and by D. W. Brainard, Thompsonville, Ct., third prize. Blanche Burpee, by E. A. Weeks, took second.

The class for best light pink was a pretty sight. Katherine Tracy took the lead, those grown by E. C. Fenn took first award and the bunch by A. H. Smith, third; this last was a very fine bunch. Mrs. Gladstone took second; this was grown by D. W. Brainard.

Mauve is a color hard to pass upon. Some of the shades are very pleasing, and, without doubt, these are the best, and also according to the judges' report. Dorothy Tennant, grown by D. W. Brainard, took first, Emily Eckford, by H. A. Jones, second, and Princess May, by A. H. Smith, third. L. D. Robinson's Butterfly was an excellent bunch of this old favorite.

Reds are a hard color to define in sweet peas. For best fifty, Firefly, grown by W. J. Eldred, took first money; it was a beautiful bright color. Cardinal, grown by A. H. Smith, took second, and "Harvard" (cardinal,) by H. A. Jones, third.

W. J. Eldred took first for new varieties, which included Gray Friar, America, Romona, Extra Early Blanche Ferry, Meteor, Duchess of York, Blanche Burpee, Alice Eckford, Eliza Eckford, Katherine Tracy, Daybreak, Duke of York, Juanita and Oddity. The second award for this class went to H. A. Jones. The varieties were Ramona, Juanita, Duke of York, Eliza Eckford, Katherine Tracy, Duchess of York, Blanche Burpee, Novelty, Meteor and Mrs. Joseph Chamberlain.

The best new variety was judged to be America, grown by E. C. Fenn; second best, Gray Friar, by E. A. Weeks; third, Juanita, by W. A. Phelps. Mrs. H. S. Hyde received first, and A. H. Smith, second, for largest number of single stems with five blooms. For the new type of double flowering sweet peas, E. A. Weeks received first award, and H. A. Jones, second. First prize for best ten stems with largest blossoms was awarded E. A. Weeks for Senator, second to W. J. Eldred, mixed, third to H. A. Jones, mixed. Spray with longest stem still attracted considerable attention. There was seven entries for this, and three awards. E. C. Fenn received first, W. A. Phelps, second, and W. J. Eldred, third.

A diploma was awarded John Wilkinson for eighteen vases of sweet peas arranged for effect. Special prizes. Peter Henderson & Co's specials for the year's novelties were awarded to E. A. Weeks for Countess of Aberdeen, America, Daybreak, Oddity, Ovid, Celestial, Gray Friar, Alice Eckford, Crown Jewel, Mikado and Novelty. The second in this class was W. J. Eldred, who had many of the varieties in the first entry, also Extra Early Blanche Ferry, Captivation and Little Dorritt.

James Vick's Son's first offer for Bride of Niagara went to W. A. Phelps, second to E. A. Weeks, third to W. J. Eldred. O. H. Dickinson's prize was awarded to A. H. Smith. The varieties entered were Lady Penzance, Emily Henderson,Gaiety,Duke of Clarence, Stanley, Senator, Katherine Tracy, Cardinal, Blanche Ferry, Boreatton, Her Majesty, Countess of Radnor.

The Gale prizes went to D. W. Brainard for Mrs. Sankey, Daybreak, Butterfly, Dorothy Tennant, Blanche Ferry, "Light Blue and Purple," Blanche Burpee, Emily Henderson, Mrs. Gladstone, Lady Penzance, American Belle and Boreatton. The second went to A. H. Smith.

There were eight entries for D. M. Ferry & Co.'s prizes for Extra Early Blanche Ferry. The first went to W. A. Phelps; the second to R. L. Persons and the third to A. H. Smith. Their first offer for Katherine Tracy was given to W. A. Phelps, the second to E. C. Fenn, the third to W. J. Eldred.

W. Atlee Burpee & Co. offered several prizes for Daybreak, Ramona and Blanche Burpee. The first award for Daybreak went to W. A. Phelps, second to D. W. Brainard. Mr. Brainard also had second for Blanche Burpee, E. C. Fenn receiving first.

The committee on awards made honorable mention of a seedling sweet pea, Little Allen, a cross by W. J. Eldred, with Emily Henderson and Royal Robe. It is a very promising variety. The committee recommend it for further trial, requesting that it be presented at the next sweet pea exhibition. Honorable mention was also made the Cornell University of Ithaca, N. Y., for a very complete exhibit of sweet peas in comparison, which to the seedsmen was of great importance, showing as it did the genuineness of various strains. Such exhibits as this will tend to make growers more careful to have their stocks true to name. Rev. W. T. Hutchins was awarded a diploma for his very complete collection, including varieties not yet on the market, one of which, Red Riding Hood,is a very marked variation from former sports. Its chief merit is its oddity. Other awards were made to Edward Cooke, E. D.

Stock and Thomas Pool for Dahlias. Donald O. McGregor, gardener for E. H. R. Lyman, Northampton, for a most beautiful display of Gloxinias and Lilium Auratum; L. D. Robinson for Gladiolus; W. T. Hodge for Hollyhocks; W. J. Eldred for Nasturtiums; Mrs. L. D. Robinson for pansies; Mrs. W. F. Gale for table centerpiece and Bride's Bouquet and to H. A. Dreer for water lilies, French Cannas and Fringed Petunias.

Mr. E. H. Barney, of the city park commissioners, contributed several vases of beautiful lotus from the ponds at Forest Park.

A diploma was awarded W. J. Eldred for novelties in sweet peas to be introduced in '97. Membership certificates were awarded E. B. Beals for asters, Galardia and Scabiosa; Thomas Pool for mixed sweet peas; Fanny D. White, Zinnias; A. V. Beebe, Holyoke, Mrs. Dexter Snow and W. T. Hodge for sweet peas; George Smith, Manchester, Vt., miscellaneous flowers.

This exhibition I have no hesitation in saying was the best of its kind ever held in this country. As far as I know no horticultural society has devoted as much attention to sweet peas; thus we stand as leaders in sweet pea culture. Yet one thing we lacked badly; that was attendance. The premiums and gratuities awarded at this show amounted to $125.75. May our exhibitions in the future be still better, as educators, and very much better attended, as they deserve to be.

On account of the sickness of the secretary the fruit and vegetable show was abandoned. When it was known that preparations had been made for it, special gratuities were awarded. These will appear later.

THE CHRYSANTHEMUM EXHIBITION.

The board of managers, desirous of making this the crowning festival of the year, offered special inducements for exhibits from the various states of the Union and from Canada. On account of this the exhibition was styled the International. We had entries from 21 states and districts and two from the Province of Canada. Owing to the forward condition of flowers in various states, not all that entered were able to exhibit. Yet enough came in to make this part of the exhibit very interesting, attracting some of the best growers in the Eastern States as visitors, among them Mr. E A. Wood, president of the Chrysanthemum Society of America, West Newton, Mr. John N. May, Mr. Ernest Asmers, Mr. Eugene Dalledouze of New York, all members of the same society.

Prizes awarded were as follows: Six bush plants, three bush plants and single specimens, Mrs. H. S. Hyde, first, the Misses Taylor, second. Donald O. McGregor of Northampton was awarded first prize for 25, 12 and six single bloom plants; A. N. Pierson, Cromwell, Ct., second; and E. H. Howland, Holyoke, third. Mr. Howland also received first for specimen standard and three standards, and Mrs. H. S. Hyde second for specimen standard. The Misses Taylor received first for three plants in the amateur class. There were 12 elegant specimens from T. D. Hatfield, Wellesley.

This brings us to the cut blooms. What a magnificent sight! Fully half the hall was taken up by this gorgeous display. The class for 12 vases, six blooms each, was an elegant sight. The first award went to A. N. Pierson, the second to John Coombs, Hartford, Ct., and the third to E. H. Howland. Next came 25 blooms, with six entries. Mrs. B. P. Cheney, Wellesley, received first, A. N. Pierson second, and John Coombs third. Mr. Howland had A1 flowers in this class and so did Mr. Hatfield. The first award for 12 cut blooms went to Mr. Pierson; the second to Mr. Howland; the third was not awarded. Mr. Pierson took first for 12 blooms, white, John Coombs, second and E. H. Howland, third. The prizes for 12 pink were awarded in this order: First, A. N. Pierson; second, Mrs. B. P. Cheney; third, E. H. R. Lyman. In the class for twelve yellow Mrs. Cheney was first, A. N. Pierson second and E. H. Howland third. T. D. Hatfield had the best single specimen bloom, L. W. Goodell, Dwight, second, and A. N. Pierson, third. Mr. Pierson also received the president's prize and also the C. R. Miller & Co. prize.

L. W. Goodell made a display of natural growth Mums, some 75 vases, showing quite a contrast with the disbudded sorts. Mr. Farquhar Macræ, of Providence, R. I., brought an elegant bunch of his very distinct chrysanthemum, Mrs. Francis B. Hayes. Mrs. H. S. Hyde exhibited well-grown Ivory plants, and F. M. Allen a group of natural growth plants.

Then came the state exhibits. The Connecticut state prize went to A. N. Pierson, Cromwell; the Delaware prize to L. E. Baylis, Wilmington; the Indiana to E. G. Hill & Co., Richmond; the Massachusetts to Mrs. B. P. Cheney, Wellesley, Mr. John Barr, gardener. This exhibit also took the capital prize of $50 for the best exhibit from any state or province. The Michigan prize was taken by Nathan Smith & Sons, Adrian; the New Hampshire by Ellis Bros., Keene; the New Jersey by John N. May, Summit; the South Carolina by I. I. & P. S. Norsitti, Charleston; the Vermont by C. E. Allen, Brattleboro; the New Brunswick, Canada, by Homer I. Cruikohauk, St. Johns.

The seedlings exhibited attracted much attention from those interested in new varieties, and were judged with care by members of the Chrysanthemum Society of America. Nathan Smith & Son sent two seedlings, Western King, which was awarded a first-class certificate and Mrs. Martin H. Ryerson, which was a charming white, the judges awarded 95 points out of a possible 100. This being the highest award, the society's prize of $50 for the best seedling was given to this variety.

Thomas H. Spaulding, of Orange, N. J., sent a beautiful lot of seedlings, including Mrs. E. F. Hyde, Mabel Downing, Mrs. Robert M. Arthur, Gladys, C. W. Ward, Kensington, and J. M. Gifford. These were awarded a diploma for collection.

On the second day of the exhibition a beautiful seedling came from Dalledouze Bros., Brooklyn, N. Y., this not being received until after the committee representing the Chrysanthemum Society of America had left the city, could not be judged by them, but our local committee awarded this a first-class certificate. It was called the Pearl. One other vase of chrysanthemums that should receive special notice was from Farquhar Macræ of Providence, R. I. It was a fine bunch of Mrs. Francis B. Hayes, exceedingly well grown.

One of the best exhibits of roses ever made at our fall shows came from A. N. Pierson, taking first award in all classes. E. H. Howland took second for display and single flower, and E. B. Beals third for display.

Carnations, the divine flower, so-called, was by far the best we have ever had. George B. Whitehead, Green's Farms, Ct., took first for display, the Cottage Gardens second for display and single variety, and E. H. Howland third for display and single variety. Other exhibitors were E. B. Beals, H. Grout, Collis & Tucker, Ware, George Smith, Manchester Vt, B. J. Shaw and A. N. Pierson. Mr. Pierson took first for Daybreak. The display from the Cottage Gardens, Queens, N. Y., in care of Mr. Littlefield were mostly for exhibition only, and included a number of new varieties that promise well, including Maud Dean, C. A. Dana and Flora Hill. This collection was awarded a diploma.

H. Grout's new seedling, Sea Shells, was noticed with honorable mention, the committee thinking it a very promising variety, resembling Della Fox in color. F. A. Blake's Scarlet seedling; John N. May's Lilly Dean and Maud Dean, and the Cottage Gardens' C. A. Dana, were noticed with letters of recommendation. The new carnation, Mayor Pingree, from John Breitmeyer & Sons,

Detroit, Mich., was not received until the second day of the show, but the committee thought it worthy a first-class certificate, which was granted.

Pansies shown by E. H. Howland received first premium, George B. Whitehead being second.

Violets were never in better condition than at this show. The winning bunch of double blue came from M. J. Moore, Highland, N. Y., A. N. Pierson, second, and George B. Whitehead, third. Others in this class were Mrs. Hyde, Brush Hill; E. H. R. Lyman, Northampton; A. H. Smith, West Springfield, and L. W. Goodell, Dwight; all well grown. Beautiful single violets were shown by A. N. Pierson, receiving the first award; and by R. E. Shuphelt, Chatham, N. Y., taking the second. Lilies of the Valley from A. N. Pierson took the first premium. A diploma was granted W. F. Gale for Palms, A. N. Pierson for display of chrysanthemums. First-class certificates were awarded L. W. Goodell for 75 varieties of chrysanthemums; also to Alexander MacLellan Newport, R.I., for a magnificent specimen of Cyanophyllum Magnificum. Some good French Cannas were shown by Robert Christie. Carl W. A. Ehlers exhibited a new variety of chrysanthemum, said to be a sport from Cullingfordii, but the judges did not think it authentic.

The amount received and due the society on account of the sweet pea show was $146.95; the premiums and gratuities awarded at this exhibition amounted to $125.75. At the chrysanthemum show the total amount received and due the society was $726.15; the premiums and gratuities amounted to $452.25.

The property of the society consists of tables, vases, glasses, printed matter, certificates, etc., as per previous inventory, $318.17; deduct for the year's use ten per cent., $31.82, leaves a net value of $286.35, the original cost of which was over $500.

We have lost four members during the year, Mrs. F. R. Belden, Mrs. O. M. Baker, Mr. O. H. Greenleaf and Mr. A. B. Underhill. The present membership is 260. There is ample room for enlarging our membership which we are very desirous of doing, and in the near future to erect a building where horticulture may have a home.

I am under obligations to the officers and members for their kind support throughout the year, and hope that the years before us may be full of profit and pleasure, in mingling together with the beauties of nature's art.

W. F. GALE, *Secretary.*

SWEET PEAS NOT CATALOGUED IN THE U. S. PREVIOUS TO 1896.—See Class 9.

Rev. W. T. Hutchins, Specialist.

America—(Vaughn) An intense and heavy cardinal stripe.
Alice Eckford—(Eckford) Apricot and cream.
Bride of Niagara—(Vick) A double sweet pea, pink and white.
Captivation—(Eckford) Light purple magenta.
Celestial—(Lorenx) Very soft mauve.
Countess of Aberdeen—(Eckford) Almost white, margined with pale pink.
Crown Jewel—(Eckford) Creamy white, tinted and veined with violet rose.
Cupid—(Burpee) Genuine dwarf Sweet Pea, white.
Daybreak—(Hutchins) A white ground, with a crimson scarlet cloud on the back of standard, with watered scarlet front.
Extra Early Blanche Ferry—(Ferry) Very early pink and white.
Gray Friar—(Burpee) A large, finely-formed, grayish blossom.
Juanita—(Burpee) *Wah-nee-ta.* A grandiflora white, delicately lined and flaked with light blue.
Little Dorritt—(Eckford) Pink and white.
Mikado—(Eckford) Deep orange cerise ground, with white stripe.
Oddity—(Burpee) Pale carmine, with bright rose edge.
Ramona—(Burpee) Creamy white, splashed and flaked with soft pink.

NEW VARIETIES LISTED THIS YEAR FOR THE FIRST TIME.—See Class 10.

Aurora—(Burpee) Salmon, pink stripe on white ground.
Brilliant—(Burpee) A new scarlet.
Burpee's New Countess—(Burpee)—Soft lavender.
California—(Lynch) Soft pink.
Columbia(Hutchins) Red, white and blue stripe.
Coquette—(Eckford) Primrose shaded fawn.
Coronet—(Hutchins) Orange stripe.
Countess of Powis—(Eckford) Orange, suffused with light purple.
Countess of Shrewsbury—(Eckford) Deep pink, suffused with light purple.
Creole—(Burpee) Light pinkish lavender standard, lavender wings.
Emily Lynch—(Lynch) A great advance on Duke of York.
Golden Gate—(Burpee) Pink, lavender and mauve blended.
Golden Gleam—(Sunset Seed and Plant Co.) New Primrose.
Lady Nina Balfour—(Eckford) Delicate mauve.

THE B. L. BRAGG CO.,

337 Main Street,
Springfield, Mass.

Special Offers of Sweet Peas for 1897.

The **"National Dozen,"** *up to date.* The cream of the entire list. Every variety of sterling merit. We offer one packet (100 seeds) each, of the following twelve beautiful Sweet Peas: Blanche Ferry, Butterfly, Cardinal, Captain of the Blues, Countess of Radnor, Duke of Clarence, Lemon Queen, Lady Penzance, Ovid, Royal Robe, Stanley and Venus. The entire set, in separate packets, each bearing our Sweet Pea guarantee, together with a copy of "Practical Helps on Sweet Peas," mailed free to any address on receipt of 50c.

Our "FLORISTS' MIXTURE," still flourishes.

The 1897 mixture contains not only all the new varieties up to date, but all those of which it was made up last year. There being none in last year's list we wished to discard. Postage paid on receipt of price to any address. Price per ounce 25c., in sealed packets, five for $1.00.

The **"BRIGHTWOOD SIX,"** of delicate new shades. One packet (100 seeds) each, of the following exquisite tints: Blushing Beauty, Countess of Radnor, Dorothy Tennant, Her Majesty, Lady Beaconsfield, Lemon Queen, and our pamphlet "Practical Helps on Sweet Peas" mailed free to any address on receipt of 25c.

Eckford's Giant Sweet Peas.

HENRY ECKFORD, Wem, Shropshire, England.

Sweet Pea Specialist of Novelties for 1897.

"Prince Edward of York." **"Queen Victoria."**

"Countess of Powis." **"Lady Nina Balfour."**

Triumph. **Salopian.**

Shahzada.

Illustrated catalogue mailed free to any address.

LOVELY—(Eckford) Soft pink.
MAID OF HONOR—(Burpee) Improved Butterfly.
MARS—(Eckford) Bright crimson.
PRIMA DONNA—(Eckford) Lovely shade of pink.
PRINCE EDWARD OF YORK—(Eckford) Standards scarlet, wings rose.
QUEEN VICTORIA—(Eckford) Soft yellow, overlaid with faint purple.
RED RIDING HOOD—(Sunset Seed and Plant Co.) The standard is drawn down into a snug hood, bright rose.
ROYAL ROSE—(Eckford) Standards deep rose, wings light rose.
SALOPIAN—(Eckford) Deep crimson, tinged with mulberry red, suffused with scarlet orange.
SHAHZADA—(Eckford) Dark maroon, with a shade of purple.
STRIPED CELESTIAL—(Lorenz) Bluish violet stripe on an azure-ground.
THE BRIDE—(Lynch) White.
TRIUMPH—(Eckford) Orange pink standards, white wings, flushed with purple.

HOMER FOOT & Co.

IRON AND STEEL.

Corner Main and State Streets,
SPRINGFIELD, MASS.

Wheels, Axles, Springs, Rims, Shafts,
Spokes, Anvils, Vises, Bellows, Fire
Brick and Clay, Farming Tools,

Floral Tools,

Famous Philadelphia Lawn Mowers,

Fairbanks' Standard Scales, Carpenters' and Machinists' Tools, Builders' Hardware, Fine Cutlery, Ladies' Scissors, Barbed Wire, Preston's Braided Truss Cable Wire, Poultry Netting, Wire Cloth, Window Screens and Screen Doors.

All Sold at Lowest Prices.

THE COMMITTEE ON NOMENCLATURE,

To expediate work, will examine the Exhibits previous to the Committee of Awards, and will attach the Committee's card in all cases in which corrections are made.

FOR THE COMMITTEE OF AWARDS.

Scales of Points for Judging, as Adopted by Various Societies and Recommended.

APPLES AND PEARS. Form, 10; size, 10; color, 10; freedom from blemishes, 20; uniformity, 20; quality, 30=100.

GRAPES. Flavor, 30; form of bunch, 10; size of bunch, 15; size of berry, 15; color, 10; firmness, 5; bloom, 5; freedom from blemishes, 10=100.

TOMATO. (This might apply to other vegetables.) Vigor, 5; earliness, 10; color, 5; solidity, 20; shape, 20; size, 10; flavor, 5; cooking qualities, 5; productiveness, 20=100.

CHRYSANTHEMUM PLANTS. Size of plant, 30; size of bloom, 30; foliage, 20; color, 10; general effect, 10=100.

CHRYSANTHEMUM FLOWERS. (Rule of Chrysanthemum Society of America.) For Commercial Purposes: Color, 25; form, 25; fullness, 15; stem, 10; petalage, 10; size, 15=100.

CHRYSANTHEMUM FLOWERS. For Exhibition Purposes: Distinctiveness, 25; color, 15; form, 15; size, 15; stem, 10; foliage, 10; fullness, 10=100.

FLORAL ARRANGEMENTS. Adaptability for purpose intended, 35; color harmony, 25; arrangement, 25; excellence of material, 15=100.

SWEET PEAS. Substance, 15; form, 25; size, 25, color, 15; fullness of stem, 20=100.

CARNATIONS. (Rule of American Carnation Society). General competition: Color, 25; size, 15; substance, 10; form, 15; stem, 20; fragrance, 15=100.

ROSES. Form and substance, 15; size, 20; color, 25; stem, 15; vigor, 10; fragrance, 15=100.

RULES AND REGULATIONS.

1. Exhibitors may replenish their flowers.
2. All flowers, fruits or vegetables offered for prizes must have been grown by the exhibitor.
3. All articles offered for prizes must have the name legibly and correctly written on stiff card, wood or other permanent material, and attached to the flower or plant. The Society's cards should be used as far as possible. No advertising matter should be allowed in connection with any exhibit.
4. Articles exhibited at the Chrysanthemum show for prizes must be placed before 11 o'clock a. m. of the first day, and the other exhibitions one hour before the time of opening. The Committees of Award will meet at that time to judge the exhibit, and nothing can be received for competition *after* that time.
5. No article to which a premium has been awarded in one class shall be allowed to compete in another; and no article forming part of a collection entered for a premium on collections shall receive a premium as a single article.
6. Committees will not award premiums simply because the exhibit is the best shown, unless the premium is merited by its superior quality.
7. All members of the Society have the right of competing for prizes. Persons *not* members, on the payment of one dollar, shall be entitled to compete on the same footing as members. Those not paying such entrance fee shall not be permitted to compete.
8. Each member is entitled to a season ticket.

SPECIAL NOTICE.

9. Entries should be made to the Secretary at least three days *before* the date of opening, stating distinctly each and every premium competed for. An entry blank will be supplied on application to the manager of exhibitions.
10. All entries not according to schedule will be disqualified.
11. All entries to be placed BY NUMBER ONLY! The name of the exhibitor to be attached *after* awards are made.
12. All exhibits of Cut Flowers must be shown in uniform vases or dishes furnished by the Society.

☞See also, Special Rules of the Garden Committee, following class 264 and special rules, page before premium list.

AMATEUR GARDENING.

"Here's a Flower for You;" flowers for all,
In there quiet homes, or in festive hall,
Whether old or young, whether weak or strong,
Whether freighted with sadness, or joyous song;
Flowers for the chamber of pillowed birth;
Flowers moist with tears at the last of earth;
Flowers in language royal and true,
Flowers for all, and "A Flower for You."

"Here's a Flower for You," blithe, bonny bride,
For the breast of the lover by your side;
Flowers for the lowly, desolate home,
Where pain and grief unbidden come;
Flowers for pleasure's giddy round,
Where mirth and joy alone abound;
"Here's a Flower for You," whoever you are,
Whether bred to a modest or lofty air.

"Here's a Flower for You," wherever you may be,
For grandsire and grandame, down to the baby;
A flower that comes to bedeck and bless
All hearts and homes with loveliness,
Like coals from off an altar fire,
To warm and lift our life up higher;
Flowers, fresh flowers to win and woo,
Your love and lucre—this flower for you.

"Here's a Flower for You," to pluck and to hold,
Of value greater than glittering gold;
With fruits of the earth and flowers of the land,
In profusion unbounded at our command;
We come to the front of a flower-strewn stage,
With AMATEUR GARDENING, in printed page;
And ring up the curtain without much ado—
A bow and a rhyme—"A Flower for You."

This flower may be had at a trifling expense,
Five Cents for a nosegay—for a year, Fifty Cents;
To gather this flower alone or EN MASSE,
Address AMATEUR GARDENING, Springfield, Mass.

MONTHLY. 50 CENTS A YEAR.

Amateur Gardening

Rev. W. T. HUTCHINS, Editor.

"Fragrance and Beauty Here Their Charms Combine."

One Dollar's Worth for Half-a-Dollar.

AMATEUR GARDENING was originated in a hot-bed of genuine love for Flowers, and founded not only in the interest of flower growers, but for the dissemination of reliable suggestions for all who would like to grow them—if they but knew how. It is a Floral and Horticultural publication, with educational and practical tendencies, leading up to a sensible recreation, rational enjoyment and helpful occupation, in combination, marking life's pathway with Fragrance and Beauty all along the way.

That AMATEUR GARDENING may have place in the front ranks of the latest developments of floriculture, and fulfill a special mission of its own, its conductors have placed its future control in the ready and experienced hands of Rev. W. T. HUTCHINS, so universally known and deservedly appreciated in the Floral World as a leader and guide in the successful rearing of Flowers, who will give its readers the benefit of his large experience especially along Floricultural lines.

A remittance of FIFTY CENTS will bring this journal as a welcome guest, monthly, for a year to any and every home in the land, each issue being filled with Floral and Horticultural information and dissertation, worth more—ten times over—than its yearly cost of FIFTY CENTS, with premiums as specified on following page.

Single copies 5 cents, on the News Stands; yearly subscriptions 50 cents.

CLARK W. BRYAN CO., Publishers,

39, 41 and 43 Lyman Street, SPRINGFIELD, MASS.

FOR the first thousand subscriptions, of **Fifty Cents** each, we will send **Ten Named Packets of Hutchins' Finest Stock of Sweet Peas,** with a retail value of Fifty Cents, accompanied by printed directions for culture, by the author of "Sweet Peas up-to-date." Or we will send **Four Packets of Goodell's Famous (Pansy Park) Pansy Seed,** of a retail value of Sixty Cents, one Hundred or more seeds in each packet, put up by Mr. Goodell, with his printed directions for growing. Or **Six Packets of Goodell's Asters** of the finest sorts, one hundred or more seeds in each packet, of a retail value of Sixty Cents, with directions for growing, by an expert and successful grower.

These seeds are not of the kind sown broadcast throughout the world at Ten cents a cord, but are freshly grown and reliable in every respect, and are selected with the purpose of giving liberal value both as regards quantity and quality.

No better Sweet Peas, Pansies or Asters are known in the world, than those grown by Messrs. Hutchins and Goodell.

CLARK W. BRYAN CO.,
Publishers

39, 41 and 43 Lyman Street,
Springfield, Mass.

Sweet Pea Exhibition.

1897.

The Most Extensive in the United States.

To be held Wednesday and Thursday, July 28th and 29th, from 1 to 10 p. m. the first day, and from 10 a. m. until 10 p. m. the second day.

Every known variety will be on exhibition. An unequaled opportunity for comparison.

☞Exhibits not complying with schedule will be disqualified. All articles for competition should be ready for the judges one hour before time of opening the first day. See Rules and Regulations.

SCHEDULE OF PRIZES.

CLASS.				
1	Display—general collection not to exceed 60 distinct varieties, 25 stems each, not to include novelties later than 1896, three prizes	$5 00	$3 00	$2 00
2	Best 30 vases, distinct named varieties, 10 sprays each, three prizes, ...	3 00	2 00	1 00
3	Best 50 sprays, any named variety, three prizes, ...	1 00	50	25
4	Best white, named variety, 50 sprays, three prizes, ...	1 00	50	25
5	Best light pink, named variety, 50 sprays, three prizes, ...	1 00	50	25
6	Best mauve, named variety, 50 sprays, three prizes, ...	1 00	50	25
7	Best red, named variety, 50 sprays, three prizes, ...	1 00	50	25
8	Best variegated, named variety, 50 sprays, three prizes, ...	1 00	50	25
9	Display, new varieties, not catalogued previous to 1896, 6 sprays each, all named, three prizes, ...	1 00	50	25

CLASS.				
10	Best new variety, not catalogued before 1897, 6 sprays, named, three prizes,	$0 50	$0 25	$0 25
11	Largest number of single stems with 5 blooms on each stem, three prizes,	50	25	25
12	Best 25 sprays of double flowering Sweet Peas,	50	25	25
13	Best 10 stems with largest blossoms, any varieties, three prizes,	25	25	25
14	Spray with longest stem, three prizes,	25	25	25
15	Display for effect. We invite competition in arranging Sweet Peas with their foliage. The society will recognize such with diplomas.			

SPECIAL PRIZES.

SILVER CUP, VALUE NOT LESS THAN $25.00.

"The Eckford Challenge Cup,"

16 Given by Henry Eckford, Wem, Shropshire, England, for the best exhibit of the Eckford Sweet Peas, varieties of the current year. Varieties to be exhibited for this premium: Queen Victoria, Lady Nina Balfour, Salopian, Triumph, Prince Edward of York, Countess of Powis, Shahzada.

Conditions: The competition open to amateurs and gentlemen gardeners only; the cup not to become the property of any competitor until he (or she) has won it twice; the winner of 1897 to give security to the committee that the cup shall be returned to the secretary of this society before July 1, 1898.

17	Best display of novelties of 1897, named, three prizes, offered by Peter Henderson & Co., New York,	$5 00	$3 00	$2 00
18	Best bunch mixed varieties of 25 sprays, grown by a child under 15 years of age, three prizes, offered by Rev. W. T. Hutchins, Indian Orchard,	1 00	75	50
19	Best bunch, 50 sprays, mixed varieties, grown by a lady, three prizes, offered by Rev. W. T. Hutchins, Indian Orchard,	1 00	75	50
20	Best 50 sprays, each of 12 named varieties, offered by O. H. Dickinson,	5 00		
21	Best 25 sprays each of 12 named varieties, two prizes, offered by W. F. Gale, Sec'y,	3 00	2 00	
22	Best set of 10 sprays each, grown from their "National Dozen" collection, two prizes, offered by the B. L. Bragg Co., *Provided* there are five or more entries, otherwise $2.00 for the *best* only.	3 00	2 00	
23	Best pot of the dwarf Sweet Pea Cupid, in bloom, three prizes, offered by W. Atlee Burpee & Co., Philadelphia,	5 00	3 00	2 00
24	Best 25 sprays Blanche Burpee, two prizes, offered by W. Atlee Burpee & Co., Philadelphia,	3 00	2 00	

CLASS.				
25	Best 25 sprays Burpee's Aurora, two prizes, offered by W. Atlee Burpee & Co., Philadelphia,	$3 00	$2 00	
26	Best 25 sprays Brilliant, two prizes, offered by W. Atlee Burpee & Co., Philadelphia,	3 00	2 00	
27	Best 25 sprays Burpee's New Countess, two prizes, offered by W. Atlee Burpee & Co., Philadelphia,	3 00	2 00	
28	Best 25 sprays of the new sweet pea, Red Riding Hood, three prizes, offered by the Sunset Seed and Plant Co., San Francisco, Cal.	7 50	5 00	2 50
29	Best 10 sprays of the new sweet pea, "Golden Gleam," three prizes, offered by the Sunset Seed and Plant Co.	1 50	1 00	50
30	For the briefest, clearest and most practicable cultural directions for Sweet Peas, that would be generally applicable throughout the United States, one prize, offered by the Sunset Seed and Plant Co., San Francisco, Cal.,	2 50		
31	For the clearest and best system of color classification that will enable the public at large to readily select from a long list a few varieties, if only a few be needed. One prize, offered by the Sunset Seed and Plant Co., San Francisco, Cal.	2 50		
32	For the best bona fide criticism of the *Sweet Pea Review*, published by the Sunset Seed and Plant Co , one prize, offered by the Sunset Seed and Plant Co., San Francisco, Cal.,	2 50		
33	For the best 10 sprays of Sweet Peas in each color class, as named in the *Sweet Pea Review*. One prize, offered by the Sunset Seed and Plant Co , San Francisco, Cal.,	5 00		
34	Best and largest general display of Sweet Peas, the complete collection of 21 books on horticultural topics, published and offered by W. Atlee Burpee & Co.			

MISCELLANEOUS CUT FLOWERS.

40 Carnations, hardy sorts, display, two prizes, annual membership each.
41 Coreopsis lanceolata, best vase, two prizes, annual membership each.
42 Campanula, display, two prizes, annual membership each.
43 Dahlias, best collection, two prizes, annual membership each.
44 Dahlias, best 12 varieties, 1 bloom each, two prizes, annual membership each.
45 Delphinium, display, two prizes, annual membership each.
46 Foxglove, display, two prizes, annual membership each.
47 Gloxinias, display, two prizes, annual membership each.
48 Gladiolus, display, two prizes, annual membership each.
49 Hollyhocks, display, two prizes, annual membership each.
50 Lilium Harrisii or Longiflorum, display, two prizes, annual membership each.

CLASS.

51 Lilium Auratum display, two prizes, annual membership each.
52 Nasturtiums, best collection, not less than 12 varieties, two prizes, annual membership each.
53 Pansies, best collection with foliage, not less than 12 varieties of 12 blooms, each, two prizes, annual membership each.
54 Pansies, best 50 blooms with foliage, two prizes, annual membership each.
55 Petunias, best collection, two prizes, annual membership each.
56 Water Lilies, display, two prizes, diplomas.
57 Perennial Phlox, display, two prizes, annual membership each.
58 Native wild flowers, display, two prizes, annual membership each.
59 Basket of flowers, arranged for effect, certificate of award.
60 Dinner Table Decoration, not including china, silver or glass, diploma.
61 Mantel Decoration, diploma.
62 Table Centerpiece, flowers or foliage, or both, two prizes, annual membership each.
63 Bride's Bouquet. Silver plate offered by the Gale Floral Company.

PLANTS.

64 Foliage plants arranged for effect, covering 200 square feet diploma.
65 Palms, best 5 specimens, distinct varieties, diploma.
66 Palms, best specimen plant, diploma.
67 Cycad, best specimen plant, diploma.
68 Ferns, best 10 specimens, distinct varieties, in not less than 6-inch pots, diploma.
69 Begonia Rex, 10 varieties, in not less than 6-inch pots, diploma.
70 New Foliage Plant, best specimens, diploma.
71 The Society awards Certificates of Merit for New and Superior Seedlings of Fruits, Flowers and Vegetables; also for skill in the cultivation of specimens exhibited, and invites all having choice specimens of any class of plants to present them at this exhibition.

NOTE.—Should the persons awarded Life and Annual Membership be already members, they may designate to whom the membership shall apply.

☞Please notify the Hall Superintendent what disposition you wish made of your Exhibit at the close of the show.

ANNUAL EXHIBITION OF

Fruits and Vegetables,

Wednesday and Thursday, September 22 and 23.

The Hall will be open to the public on Wednesday at 1, closing at 10 p. m., and on Thursday from 10 a. m. to 10 p. m.

All articles entered for competition must be ready for the judges at 12 m. on the first day. See Rules and Regulations.

FRUIT.

CLASS.				
73	Best general display of fruit, first premium, life membership.			
74	Best general display of fruit, second premium, "Success with Small Fruits," offered by the Gale Floral Company.			
	APPLES.			
75	Best display of varieties, 6 specimens to each plate, three prizes, ...	$3 00	$2 00	$1 00
76	Best plate Baldwin, 6 specimens, annual membership and two cash prizes, ...		50	25
77	Best plate Hubbardston, 6 specimens, annual membership and two cash prizes, . .		50	25
78	Best plate Maiden's Blush, 6 specimens, annual membership and two cash prizes, .		50	25
79	Best plate Northern Spy, 6 specimens, annual membership and two cash prizes, . .		50	25
80	Best plate Rhode Island Greening, 6 specimens, annual membership and two cash prizes, ...		50	25
81	Best plate Roxbury Russett, 6 specimens, annual membership and two cash prizes, .		50	25
82	Best plate Tolman's Sweet, 6 specimens, annual membership and two cash prizes, .		50	25
83	Best plate any other variety, 6 specimens, annual membership and two cash prizes, .		50	25
	PEARS.			
84	Best display of varieties, 6 specimens to each plate, three prizes, ...	$3 00	$2 00	$1 00
85	Best plate Sheldon, 6 specimens, annual membership and two cash prizes, ...		50	25
86	Best plate Sekel, 6 specimens, annual membership and two cash prizes, . . .		50	25

CLASS.				
87	Best plate Bose, 6 specimens, annual membership and two cash prizes,		$0 50	$0 25
88	Best plate Bartlett, 6 specimens, annual membership and two cash prizes,		50	25
89	Best plate Swan's Orange, 6 specimens, annual membership and two cash prizes,		50	25
90	Best plate Eastern Bell, 6 specimens, annual membership and two cash prizes,		50	25
91	Best plate Flemish Beauty, 6 specimens, annual membership and two cash prizes,		50	25
92	Best plate any other variety, 6 specimens, annual membership and two cash prizes,		50	25
	PLUMS.			
93	Best single plate of 12 specimens of one variety, three prizes,	$1 00	$0 50	$0 25
	PEACHES.			
94	Best single plate of 12 specimens of one variety, three prizes,	$1 00	$0 50	$0 25
	QUINCES.			
95	Best single plate of 6 specimens of one variety, three prizes,	$1 00	$0 50	$0 25
	GRAPES.			
96	Best display of varieties, 3 bunches each, three prizes,	$3 00	$2 00	$1 00
97	Best plate Delaware, 3 bunches, annual membership and two cash prizes,		50	25
98	Best plate Niagara, 3 bunches, annual membership and two cash prizes,		50	25
99	Best plate Concord, 3 bunches, annual membership and two cash prizes,		50	25
100	Best plate Lady, 3 bunches, annual membership and two cash prizes,		50	25
101	Best plate Worden, 3 bunches, annual membership and two cash prizes,		50	25
102	Best plate Wilder, 3 bunches, annual membership and two cash prizes,		50	25
103	Best plate Eaton, 3 bunches, annual membership and two cash prizes,		50	25
104	Best plate of any other variety, 3 bunches, annual membership and two cash prizes,		50	25

The attention of fruit growers is called to the fact that our exhibitions are a sort of FRUIT MARKET. By a vote of the Society those interested are allowed to buy and sell as their interests can best be served. It is our wish that this be not only an exhibition worthy the name, but that it may be profitable to all—seller and buyer alike. Nursery agents are invited to meet would-be buyers of their stock at this exhibition.

☞Please notify the Hall Superintendent what disposition you wish made of your exhibit at the close of the show.

VEGETABLES.

CLASS.				
105	Best collection, to occupy table 12 by 3 feet,	$5 00	$4 00	$3 00
106	Beets, best 12 turnips rooted, two prizes,		75	50
107	Carrots, best 12, two prizes,		75	50
108	Cauliflower, best 3 specimens, two prizes,		1 00	50
109	Cabbage, best 3 white, two prizes,		75	50
110	Cabbage, best 3 red, two prizes,		75	50
111	Celery, best 3 bunches, any variety, two prizes,		75	50
112	Corn, sweet, best 12 ears, any variety, two prizes,		75	50
113	Corn, yellow, best 12 ears, traced, any variety, two prizes,		75	50
114	Beans, large Lima, two quarts, two prizes,		50	25
115	Beans, bush, Lima, two quarts, two prizes,		50	25
116	Endive, three specimens, two prizes,		50	25
117	Egg plant, three specimens, purple, two prizes,		50	25
118	Horse-radish, 6 roots, two prizes,		50	25
119	Muskmelons, 2 specimens, yellow flushed, two prizes,		50	25
120	Muskmelons, 2 specimens, green flushed, two prizes,		50	25
121	Onions, 12 Danvers, two prizes,		50	25
122	Onions, 12 red, two prizes,		50	25
123	Onions, 12 white, two prizes,		50	25
124	Parsnips, 12 specimens, two prizes,		50	25
125	Potatoes, 4 varieties, 12 specimens each, two prizes,		1 00	75
126	Potatoes, 12 specimens, any variety, two prizes,		50	25
127	Salsify, 12 specimens, two prizes,		50	25
128	Squashes, 3 Hubbard, two prizes,		1 00	75
129	Squashes, 3 Essex Hybrid, two prizes,		1 00	75
130	Squashes, 3 Marblehead, two prizes,		1 00	75
131	Squashes, 3 Boston Marrow, two prizes,		1 00	75
132	Squashes, 3 any other variety, two prizes,		1 00	75
133	Tomatoes, three varieties, 12 specimens each, two prizes,		50	25
134	Tomatoes, collection, not less than 6 varieties 12 specimens each, two prizes,		1 00	75
135	Turnips, 12 Flat, two prizes,		50	25
136	Turnips, 12 Swedish, two prizes,		50	25
137	Watermelons, 2 specimens, two prizes,		1 00	50

The Society awards Certificates of Merit for New and Superior Seedlings of Fruits, Flowers and Vegetables; also for skill in the cultivation of specimens exhibited, and invites all having choice specimens of any class of plants, to present them at this exhibition.

NOTE.—Should the persons awarded Life and Annual Membership be already members, they may designate to whom the membership shall apply.

SPECIAL RULES OF THE FRUIT AND VEGETABLE COMMITTEE.

13. The specimens offered must be well-grown and placed on the tables clean, correctly labeled and fully complying with Rules and Regulations of the Society.
14. All Exhibits of Fruit and Vegetables offered for premiums must be composed of exactly the number of specimens or quantity named in the schedule.
15. The exhibitor will receive from the Secretary an Entry Card specifying the class and number of the entry, which must be placed with the exhibit when arranged for exhibition, for the guidance of Committees.
16. Premiums will not be awarded unless the exhibit is deemed worthy.

☞ Please notify the Hall Superintendent what disposition you wish made of your Exhibit at the close of the show.

INTERNATIONAL

Chrysanthemum Exhibition.

Wednesday, Thursday and Friday, November 10, 11 and 12, 1897.

An Exhibition of Extraordinary Merit.

The Hall will be open to the public on the first day from 1 to 10 p. m., and other days from 10 a. m. to 10 p. m.

☞All articles for competition must be ready for examination by the Committee at 11 a. m. on the opening day. See also Rules and Regulations, page 28.

SCHEDULE OF PRIZES.

CHRYSANTHEMUMS—PLANTS.

SECTION A.

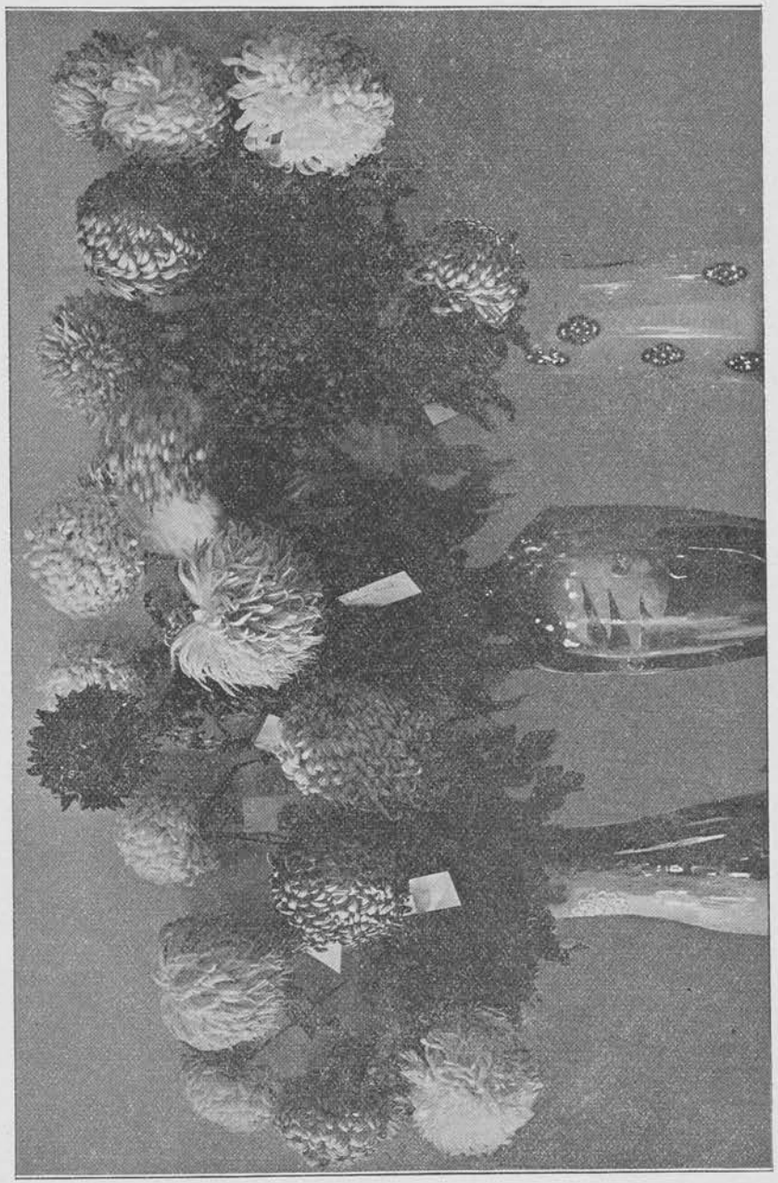
OPEN TO ALL.

NOTICE.—Bush plants must not be less than 30 inches in diameter and need not be grown to single stem.

*Standards— The stems must not be less than 30 inches high, from top of soil in pot, with heads not less than two feet in diameter.

(See Rules and Regulations.)

CLASS.				
139	Six plants of distinct named varieties, three prizes,	$6 00	$4 00	$2 00
140	Three plants of distinct named varieties, three prizes,	3 00	2 00	1 00
141	Single specimen plant, named, three prizes,	2 00	1 00	50
142	Twenty-five single bloom plants, in not over 6-inch pots, not more than two of one variety, named, three prizes,	6 00	4 00	2 00
143	Twelve single bloom plants in not over 6-inch pots, not more than two of one variety, named, three prizes,	3 00	2 00	1 00
144	Six single bloom plants in not over 6-inch pots, all different varieties, named,	1 50	1 00	50
145	Single Specimen Standard,* three prizes,	1 50	1 00	50
146	Three Standards,* all different varieties,	3 00	2 00	1 00
147	Specimen bush plant, grafted with not less than three varieties, diploma.			
148	Ten plants, 10 varieties, novelties introduced during spring of 1897, diploma.			



MASSACHUSETTS EXHIBIT. WINNER OF THE CAPITAL PRIZE, 1896.

SECTION B.

Not open to professionals or those who employ a professional gardener.

CLASS.				
150	Twelve plants, distinct named varieties, not less than 24 inches in diameter, three prizes,	$3 00	$2 00	$1 00
151	Six plants, distinct named varieties, not less than 24 inches in diameter, three prizes,	2 00	1 00	50
152	Three plants, distinct named variety, not less than 24 inches in diameter, three prizes,	1 00	50	25
153	One specimen plant, named, not less than 24 inches in diameter, three prizes,	50	25	25
154	Twelve single bloom plants, in not over 6-inch pots, named, three prizes,	2 00	1 50	1 00
155	Six single bloom plants, in not over 6-inch pots, named, three prizes,	1 00	75	50
156	One single bloom plant, in not over 6-inch pot, named, three prizes,	50	25	25

CUT BLOOMS.

SECTION C.

OPEN TO ALL.

157	Twelve vases, 6 blooms of a kind in each, 12 distinct named varieties, three prizes,	$15 00	$8 00	$5 00
158	Twenty-five cut blooms, one each of 25 distinct named varieties, three prizes,	6 00	4 00	3 00
159	Twelve cut blooms, one each of 12 distinct named varieties, three prizes,	3 00	2 00	1 00
160	Twelve blooms white, all one variety, three prizes,	4 00	2 00	1 00
161	Twelve blooms pink, all one variety, three prizes,	4 00	2 00	1 00
162	Twelve blooms yellow, all one variety, three prizes,	4 00	2 00	1 00
163	Single specimen bloom, three prizes,	75	50	25

SECTION D.

166	Best 25 blooms, mixed varieties, grown by amateurs, three prizes,	2 00	1 00	50

SECTION E.

INTERNATIONAL COMPETITION.

Twenty-five blooms of 5 distinct named varieties, (5 blooms each) open to every State and Territory in the Union; also, to all the Canadian Provinces. The best 25 blooms from each will be awarded $10 as follows:

CLASS.			CLASS.		
167	Alabama,	$10 00	176	Florida,	$10 00
168	Alaska Ter.,	10 00	177	Georgia,	10 00
169	Arizona Ter.,	10 00	178	Idaho,	10 00
170	Arkansas	10 00	179	Illinois,	10 00
171	California,	10 00	180	Indiana,	10 00
172	Colorado,	10 00	181	Indian Ter.,	10 00
173	Connecticut,	10 00	182	Iowa,	10 00
174	Delaware,	10 00	183	Kansas,	10 00
175	District of Columbia	10 00	184	Kentucky,	10 00

CLASS.			CLASS.		
185	Louisiana	$10 00	205	Pennsylvania,	$10 00
186	Maine,	10 00	206	Rhode Island,	10 00
187	Maryland,	10 00	207	South Carolina,	10 00
188	Massachusetts,	10 00	208	South Dakota,	10 00
189	Michigan,	10 00	209	Tennessee,	10 00
190	Minnesota,	10 00	210	Texas,	10 00
191	Mississippi,	10 00	211	Utah,	10 00
192	Missouri,	10 00	212	Vermont,	10 00
193	Montana,	10 00	213	Virginia,	10 00
194	Nebraska,	10 00	214	Washington,	10 00
195	Nevada,	10 00	215	West Virginia,	10 00
196	New Hampshire,	10 00	216	Wisconsin,	10 00
197	New Jersey,	10 00	217	Wyoming,	10 00
198	New Mexico Tr,	10 00	218	British Columbia	10 00
199	New York,	10 00	219	Manitoba,	10 00
200	North Carolina,	10 00	220	New Brunswick,	10 00
201	North Dakota,	10 00	221	Nova Scotia,	10 00
202	Ohio,	10 00	222	Ontario,	10 00
203	Oklahoma Ter.,	10 00	223	Quebec,	10 00
204,	Oregon	10 00			

224 These exhibits from the several States and Provinces are also to compete with each other for a capital prize of $25. In addition, each exhibit will receive an elegant lithographed certificate, which will be of *special value* to all in the trade. The several Exhibits will be known for example as:

International Contest
Massachusetts Exhibit
Grown by.....

International Contest
Illinois Exhibit.
Grown by.....

Or whatever State or Province they come from, and ticketed accordingly.

These exhibits will be of much interest to all lovers of the Chrysanthemum, for they will show the highest state of cultivation yet reached in the various sections of this continent, which will be compared with each other side by side.

The judges will be Chrysanthemum experts of national reputation.

N. B —These Exhibits will be shown in five vases, one variety in each, with foliage.

SEEDLINGS.

SECTION F.

225 Best 6 flowers of new seedling white, certificate or diploma.
226 Best 6 flowers of new seedling yellow, certificate or diploma.
227 Best 6 flowers of new seedling pink, certificate or diploma.
228 Best 6 flowers of new seedling any other color,certificate or diploma.

The Seedling Committee of the Chrysanthemum Society of America have been invited to hold a meeting in this city in connection with this exhibition. Growers are invited to present seedlings for examination by the committee at this time, please note.

WHITE CHRYSANTHEMUM, MRS. MARTIN H. RYERSON.

The Seedling that received the $50.00 prize from the Hampden County Horticultural Society, Nov., 1896, being awarded 95 points by the Judges. Exhibited by Nathan Smith & Son, Adrian, Mich.

Full particulars and official notice relating to this will appear in the trade papers after the August meeting of the Society of American Florists and the Chrysanthemum Society of America.

The Chrysanthemum Society of America requires that not less than 6 blooms of each variety be shown, and those only which have been given the second year's trial.

CLASS

229 ☞The seedling receiving the highest number of points (not less than eighty-five), by the Committee of the Chrysanthemum Society of America at their meeting here will receive in addition from this Society a cash prize of $25.

SPECIAL PRIZES.

230	Best vase of 50 blooms, mixed varieties, named, offered by E. P. Chapin, president,	$10 00	
231	Best vase chrysanthemums, 50 blooms, any one variety, offered by J. C. Lutz, . .	10 00	
232	Best vase of 25 blooms, mixed varieties, named, offered by the C. R. Miller Co , .	5 00	

ROSES.

236	General display of cut blooms, three prizes, .	$5 00	$3 00	$2 00
237	Twelve blooms, one each of 12 named varieties, three prizes, ...	2 00	1 00	75
238	Single bloom, named, three prizes, . . .	50	25	25
239	Best vase of new rose, not yet introduced, certificate or diploma.			

PANSIES.

240	Fifty cut blooms on platter, three prizes, .	$3 00	$2 00	$1 00
241	Twelve distinct blooms, three prizes, . .	1 00	50	25

VIOLETS.

242	Best bunch of 100 double blue, three prizes, .	$1 50	$1 00	$0 50
243	Best bunch of 100 double white, three prizes,	1 50	1 00	50
244	Best bunch of 100 single blue, three prizes, .	1 50	1 00	50

LILIES-OF-THE-VALLEY.

245	Best 50 sprays, two prizes, ...	$2 00	$1 00

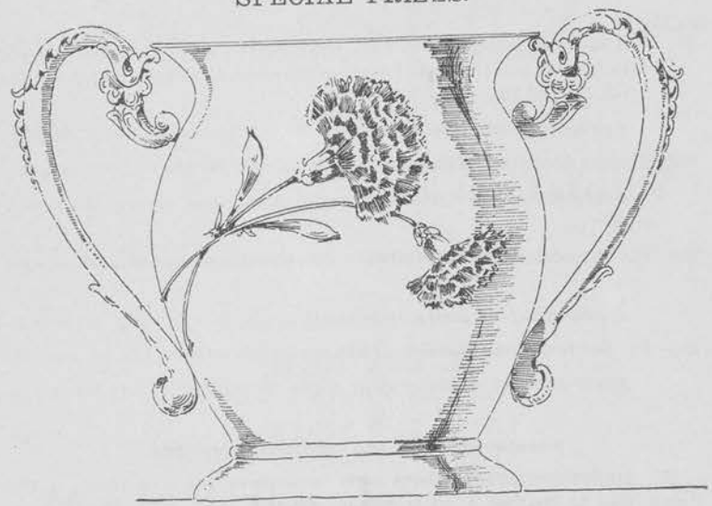
MISCELLANEOUS.

246 Twelve Specimen Palms, diploma.
247 Collection of Palms to occupy 100 square feet, diploma.
248 Collection of Ferns to occupy 100 square feet, diploma.
249 Twelve Ferns in not less than 6-inch pots, diploma.
250 New Foliage Plant, diploma
251 New Flowering Plant, other than chrysanthemum, in bloom, diploma.
252 Cyclamen, 6 plants, not over 8-inch pots, diploma.
253 Mushrooms, best dish of 25 mixed, diploma.
254 The Society awards Certificates of Merit for New and Superior Seedlings of Fruits, Flowers and Vegetables; also for skill in the cultivation of specimens exhibited, and invites all having choice specimens of any class of plants to present them at this exhibition.

CARNATIONS.

CLASS.				
255	Display of cut blooms, 10 blooms of each variety in vases, with foliage, three prizes,	$4 00	$2 00	$1 00
256	Single variety, 10 blooms in vase with foliage, three prizes,	50	25	25
257	Best vase of 50 blooms, any color,	2 00	1 00	50

SPECIAL PRIZES.



SILVER CUP, VALUE $25.00.

Offered by The Cottage Gardens, Queens, N. Y., C. W. Ward, Mgr.

258 For the best seedling carnation, originated and grown by the exhibitor, the exhibit to consist of a vase of twelve perfect blooms, six half open buds, and six buds showing color, and three sprays of foliage from the seedling plants on which the flowers exhibited are grown. A perfect flower shall mean one that has not a bursted calyx, has a stiff stem at least 15 inches long, and is otherwise reasonably perfect in form. No premium shall be awarded to a variety that has a weak neck or does not hold the flower erect, and no premium shall be awarded to any seedling where the flower shall be less than 3 inches in diameter.

CASH PRIZE $5.00,

259 For best vase of not less than 25 blooms of the new carnation, NOVELTY Mayor Pingree, offered by John Breitmeyer & Sons, Detroit, Mich.

260 Best vase of 50 blooms, any variety, named, offered by secretary, $5.00

☞ Please notify the Hall Superintendent what disposition you wish made of your Exhibit at the close of the show.

PRIZES FOR GARDENS AND GREENHOUSES.

WITHIN THE COUNTY OF HAMPDEN.

CLASS.

261 For the best arranged and best kept flower garden, named Hardy Perennial and Biennial Plants admissible, Certificates of Awards, 1st, 2d and 3d.

Application for a visit must be made on or before the first of August.

262 For the best Rose House during the month of March. Certificate.

Application for a visit may be made at any time during the month of March.

263 For the best Vegetable Garden. Certificates of awards, 1st, 2d and 3d.

Application for a visit may be made at any time during the season.

264 For the best Fruit Garden. Certificates of awards, 1st, 2d and 3d.

Application for a visit may be made at any time during the season.

Special Rules for the Garden Committee.

17. All applications for visits must be made to the Chairman of the Committee, in writing, at the times mentioned.

18. It shall be the duty of the Committee to select from the applications those which may seem most deserving of notice, and to visit as many places, and as often, as they may deem expedient.

19. In making all examinations, the utmost regard must be paid to economy and general thrift; in cases, however, of pleasure, landscape or ornamental grounds, more allowance must be made for taste and design, and a gratuity or complimentary notice may be given at the discretion of the committee.

20. The Committee may, at their discretion, give Gratuities, or substitute gratuities for prizes, as may best promote the objects of the society and meet special cases; always, of course, within the limits of the appropriation.

21. Competitors for the prizes shall furnish to the committee, if required, written statements of their modes of cultivation, the quantities and kinds of manure applied, amount of labor, and any other particulars, under the penalty of forfeiture of such prizes, if withheld.

22. The expenses of the Committee shall be paid by the Society, and record shall be kept by the Chairman of all places visited.


HAMPDEN COUNTY HORTICULTURAL SOCIETY,
ORGANIZED
JAN. 15TH 1861.

GENERAL TOPICS:

FORESTRY.

VOL. 22. | 1894. NOVEMBER. | No. 10.

. . . THE . . .

MINNESOTA HORTICULTURIST

ISSUED MONTHLY,

UNDER THE MANAGEMENT OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY

FOR THE PURPOSE OF DISSEMINATING THE HORTICULTURAL INFORMATION COLLECTED THROUGH THE AGENCY OF THE SOCIETY.

EDITED BY THE SECRETARY,
A. W. LATHAM
OFFICE AND LIBRARY, 207 KASOTA BLOCK,
Corner Fourth St. and Hennepin Avenue.
MINNEAPOLIS, MINN.

PRESS OF HARRISON & SMITH,
MINNEAPOLIS.

SUPPLEMENT TO

The Minnesota Horticulturist.

VOL. 22 MARCH, 1894. NO. 2

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FARMERS'

Handy References

BY THE

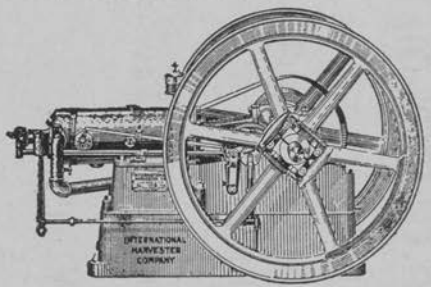
Minnesota Farmers' Institutes

CONTAINING

Common Formulae
Treatment of Animal Diseases
Handy Devices
Statistics and Hints

USEFUL TO FARMERS

MAY, 1908



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Sawing, Spraying, Pumping outfits and jacks.

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FARMERS' INSTITUTE

Farmers' Handy References

"KNOWLEDGE IS POWER"

Edited by
A. D. WILSON, Supt.

May, 1908

HALL, BLACK & CO., PRINTERS
MINNEAPOLIS

PREFACE.

For many years it has been customary to give out Institute Annuals at each Farmers' Institute held in the State. These books, containing the best thought by our farmers and scientists are very valuable additions to the farmers' library and are highly prized by those most familiar with them. Many farmers have nearly a complete set of these books from No. 1 up to No. 20.

So many institutes were held during the year 1907-1908, and they were so well attended that the 35,000 edition of Annual No. 20 was completely exhausted by the winter institutes. It is the desire of the Institute workers to leave at each meeting something that will be of real value as a reference. An extra edition of Annual No. 20 would have entailed great cost and it was therefore deemed advisable to publish for the summer institutes of 1908 this Handy Reference Book, containing in convenient form the formulae and information so often needed on the farm and very often on short notice. Those who wish more information than is given here on these subjects can get it by sending for bulletins mentioned herein.

A. D. WILSON,
Superintendent.

"GET TOGETHER."

A uniform carload of cattle, hogs, sheep or potatoes, always brings a better price than does a mixed load. It is always to the advantage of the farmer if the buyer comes to him rather than for him to go to the buyer, as he has his product at home where he can hold it if the price does not suit him, which he cannot well do if he has hauled it or shipped it to market. A buyer can pay a higher price for a product where he can get it in large quantities, because it takes less time and expense for him to get the amount he needs.

The above facts make it obviously to the interest of the farmers in any locality to "get together" for the purpose of producing some product of uniform quality and in large enough quantities to attract buyers.

Twelve farmers at a small town in North Dakota "got together" on growing potatoes. Each farmer grew from ten to forty acres of a certain variety. They get from 5 cents to 10 cents per bushel more for their potatoes because a postal to their secretary brings a car of uniform potatoes, while at other towns a buyer spends two or more days "picking up" a carload, and then they are not of uniform quality. At West Salem, Wis., thirty farmers are breeding Guernsey cattle. They use better sires than most breeders can afford when working alone. Buyers come to them for Guernseys, because in one day they can look over a few hundred head. At. St. Cloud, Minn,. several men are breeding Shorthorn cattle. Breeders all over the country know this and go to St. Cloud for Shorthorns. Any

community may become noted for the excellence and quantity of any particular product and reap the benefits therefrom. Are the farmers of Minnesota going to be behind in the race? Shall we "get together?" Think it over and talk it over with your neighbors. Here is an opportunity to increase your profits.

A PLAN FOR IMPROVING LIVE STOCK.

Andrew Boss.

Plan for Organizing a Community:

An excellent plan of organization of community breeders' associations is being put forward by the Michigan College of Agriculture. The plan is to organize the farmers of the community into associations, each association to control 120 cows. One farmer may put in 10 cows, another 20, or any desired number. The association is then divided into blocks, each block containing 40 cows. Three registered bulls are bought of the chosen breed, and one placed with each block of cows. The cost may be pro rata among the members according to the number of cows owned. At the end of two years the bulls are rotated, No. 1 going to Block II, No. 2 going to Block III, and No. 3 to Block I. Two years later the bulls are rotated again and two years following that three new bulls are purchased to replace the original ones. A service fee of $1.00 for members and $2.00 for non-members is charged, thus providing the funds from which to defray cost of maintenance and handling sires.

Applied to Pure-Breds:

While the above plan is applied to a system of grading up native cattle, it can easily be

adapted to the problem of a neighborhood breeding a class of pure bred stock, greatly reducing the cost of pure bred sires and resulting in a center for high class stock. The Division of Animal Husbandry of the College of Agriculture, St. Anthony Park, will furnish rules and by-laws for such an organization and otherwise aid in establishing such centers in Minnesota.

SPRAYING WEEDS.

Mustard may be destroyed in grain fields without injury to the grain by spraying with a 3% solution of copper sulphate or with a 20% per cent solution of iron sulphate. Iron sulphate is the cheaper chemical and is more commonly used. It is a by-product in the manufacture of wire and can be purchased at from $12.00 to $15.00 per ton. It usually comes in 100-lb. socks.

100 lbs. dissolved in a barrel (50 gals.) of water makes a 20% solution and the 50 gals. is sufficient to spray one acre. Mustard should be sprayed before it forms pods. The smaller the plants the easier they are killed.

Spraying machines are offered for sale at from $60 to $150, that spray a strip of land from 16 ft. to 24 ft. wide. They have a tank holding from 50 to 160 gals. of water, mounted on two wheels and a force pump run by the traction of the wheels. Sufficient pressure must be obtained to force the solution thru fine nozzles to make a misty, fog-like spray that settles on the leaves without falling to the ground. Large fields badly infested with mustard have been sprayed and 90 to 95 per cent of the mustard destroyed at a cost of 60 cents

to 75 cents per acre for material and 15 cents to 25 cents per acre for labor. French weed and kinghead were injured by this treatment, but not enough to prevent them from seeding. Canada thistles were injured, but grow up from the roots again. Sow thistles and wild oats were uninjured by this treatment.

SMUT TREATMENT.

Oat smut and stinking smut of wheat are prevented by treating the seed grain. The oat smut is easily seen, as it causes all kernels in a head of oats to turn black, the spores of the smut taking the place of the oat kernels. The stinking smut of wheat, or bunt, is not so easily seen, as it produces its spores within the kernels of wheat and they are not seen unless the kernel is broken open. The spores of these smuts do not live over in the soil, but are carried from one year to the next on the surface of the seed grain. These grains may be treated sufficiently to kill the smut spores without injury to the grain.

Formaline Treatment.

Formaline may be bought at any drug store at from 25 to 50 cents per pint or pound. It is a liquid. One pint of formaline added to 45 gallons of water makes sufficient solution to treat 60 to 85 bushels of oats, or 80 to 100 bushels of wheat. Grain should be thoroly fanned before treating. It is just necessary to get the seeds moistened with the solution. There are machines manufactured for the purpose, or the grain may be spread on a tight floor and the solution sprinkled on with a sprinkling can. The grain

should be shoveled over in the meantime to make sure that all seeds are moistened. Shovel up in a pile and throw a blanket or some sacks over so the fumes of the formaline may kill any spores that were missed with the liquid. Treat 12 to 20 hours before sowing. Treat sacks, drill box and other receptacles in which the grain is handled. The solution causes the grain to swell slightly, hence it is necessary to open the drill ¼ to ½ bu. per acre wider.

BARLEY SMUT AND LOOSE SMUT OF WHEAT.

These two smuts are plainly seen in the field when the grain is just heading out. The smut is carried from one crop to the next in the seed, but the spores are evidently within the kernels of grain, hence the treatment that is effective with the other smuts has no effect on these smuts. Dipping for 10 minutes in water kept at a temperature of 132° to 133°F. has been recommended. This treatment is hard to make and not advisable under farm conditions. Sow seed from a field that is free from this smut, or a small amount of seed can be obtained pure by carefully pulling by hand from a small seed plot the smutted heads as they appear.

FLAX WILT.

Flax wilt, the disease that attacks flax and causes the young plants to die when flax is grown for several years on the same ground is also a fungous disease. It lives for several years in the soil, hence it is not wise to sow flax oftener than once every seven years.

Seed taken from diseased fields to be sown on clean land, may be effectively treated by formaline mixed the same as for oat smut. Care must be taken not to get flax too wet with the solution as it will get gummy and stick together.

CORN SMUT.

C. P. Bull.

Corn smut stimulates the plant on which it grows into enlarged growths which enhance the development of the smut. The large slimy, dark colored outgrowths so often found on corn are the results of this stimulating effect. Corn smut is not carried by the seed in any appreciable degree, but is carried from one year to the next in the soil. A soil containing lots of vegetable matter or a manure pile are excellent places for the breeding of smut spores.

To lessen the attack of smut on corn there is no better way than to carefully watch the field and gather the large smut masses as they appear. If a stalk is badly infested it should be entirely cut out. A diligent effort for one season will greatly reduce the amount of smut for the next year. If the work is followed up during the succeeding seasons the corn smut will need but little attention after two or three years.

When smut masses and plants infested with smut are gathered, be sure to carry them off the field and burn or bury them. Do not throw them on the ground or on the manure pile, for some of the spores may ripen and infect the next crop.

AGRICULTURAL COST STATISTICS.

E. C. Parker.

The following statistics have been collected by the Minnesota Agricultural Experiment Station and the Bureau of Statistics of the U. S. Department of Agriculture. In three counties of Minnesota, namely, Rice, Lyon and Norman counties, an employee of the Experiment Station is located, whose duties are to visit about ten farms daily and collect labor reports from the farm managers concerning the work of the men and teams in crop and live stock production. Cash sales and expenditures are also recorded and the amounts of grain and roughage fed to the live stock. Inventories of all live stock, machinery, crop products, etc., are taken at the beginning and close of each year. The data collected in this way is posted in such a manner as to show the net receipts of the farms, also to show the cost of the various farm operations and the cost of producing the farm crops.

TABLE I.—Total cost per acre of producing field crops.

CROP	Northfield (Rice County).	Marshall (Lyon County).	Halstad (Norman County).	Minnesota Experiment Station.	Large farm northwestern Minn.
Barley—spring plowing	$9.135	$8.576	$6.410	.....	$5.967
Corn—earshucked from standing stalks	11.194	9.368	.....	.....	.....
Corn—cut, shocked, and shredded	14.745	.....	.....	.....	.....
Corn—cut, shocked, and hauled in from the field	.....	11.020	.....	.....	.....
Corn—grown thickly and siloed	.....	.....	.....	$18.212	.....
Flax—thrashed from windrow	9.828	.....	6.871	.....	6.139
Flax—unbound, stacked, thrashed	.....	8.861	6.727	.....	.....
Flax—bound, shocked, stacked and thrashed	.....	9.260	.....	.....	.....
Fodder corn—cut and shocked in field	10.526	.....	8.073	.....	7.518
Fodder corn—cut, shocked, and stacked	12.197	.....	.....	.....	.....
Hay (timothy and clover), two cuttings	6.966	.....	.....	.....	.....
Hay (millet)	9.184	8.162	5.973	.....	.....
Hay (wild grasses)	5.850	5.179	2.872	.....	2.286
Hay (timothy)	.....	.....	.....	.....	3.302
Mangles	.....	.....	.....	34.081	.....
Millet—cut for seed	9.383	.....	6.584	.....	.....
Oats—fall plowing	9.837	8.829	6.314	.....	5.878
Oats—disked corn stubble	9.002	.....	.....	.....	.....
Potatoes	.....	.....	.....	.....	23.381
Rye—spring sown	.....	.....	.....	.....	6.090
Timothy—cut for seed	5.957	.....	.....	.....	4.079
Wheat fall plowing	.....	7.890	6.262	.....	5.824

Note: These crop costs are averaged from all farms reporting in each county. The detailed cost of crop productions is illustrated in Table II. In making comparisons between various crops the data from one county only should be used.

TABLE II.—Cost of producing corn—ears husked from the standing stalks.

Operation.	Northfield (Rice County).			Marshall (Lyon County).		
	Total acreage, three years.	Total cost.	Cost per acre.	Total acreage, three years.	Total cost.	Cost per acre.
Seed value	509.35	$108.68	$0.213	776.71	$128.36	$0.165
Shelling seed	411.07	9.57	.023	467.37	13.06	.028
Plowing	605.89	730.28	1.205	579.78	602.50	1.039
Dragging	791.75	380.37	.480	681.97	305.12	.447
Planting (horse planter)	670.83	150.72	.225	711.08	180.27	.254
Cultivating	776.34	1,256.61	1.619	701.16	934.71	1.333
Weeding	.....	.....	.....	133.04	14.57	.110
Husking on hill	331.32	1,164.77	3.516	169.21	440.09	2.601
Machinery cost	.....	.....	.413	.....	.....	.391
Land rental	.....	.....	3.500	.....	.....	3.000
Total	.....	.....	11.194	.....	.....	9.368

Note: The items entering into the cost of producing field crops are seed value, labor of men and teams, machinery depreciation and repairs, and rental value of land. Average cost of horse labor on farms is shown in Table IV. Cost of man labor is based on wages and farm board. Machinery cost per acre is determined by dividing the average annual depreciation and repair charge by the average annual acreage covered by each machine. Land rental, or interest, on the investment in land should always be included in the cost of production. The amount remaining over and above these costs is "net profit."

TABLE III.—Average annual cost of maintaining a farm work horse.

	Rice Co. Av. 04-05-06-07.	Lyon Co. Av. 04-05-06-07.	Norman Co. Av 04-05-06-07.	1820 Acre Farm Norman Co. Av. 04-05-06-07.
Interest on investment	$5.54	$4.69	$5.16	$4.24
Depreciation	5.56	6.93	5.82	1.04
Harness depreciation	2.09	1.64	1.35	1.10
Shoeing	1.41	.49	.12	....
Feed	63.49	58.71	42.34	40.21
Labor	11.89	14.06	19.68	18.62
Miscellaneous expense	.41	.49	.61	.03
Total	$90.39	$87.01	$75.08	$65.24

Note: The depreciation charges shown in this table represent the change in values as actually shown by inventories during the years 1904, 1905, 1906, 1907. The working life of a farm horse will not average more than 10 years so that an annual depreciation charge of $15.00 is justified when costs through a long period of time are considered.

TABLE IV.—Cost of horse labor per hour.

	1904	1905	1906	1907	Average
Northfield (Rice County)	.0833	.0852	.0913	.1102	.0925
Marshall (Lyon County)	.0895	.0716	.0831	.0902	.0836
Halstad (Norman County)	.0727	.0672	.0762	.0767	.0732
1.820 acre farm (Norman County)	.0660	.0768	.0679	.0877	.0746

Note: The cost of horse labor per hour is determined by dividing the total cost of maintaining the work horses by the number of hours worked. The cost of all horse labor or any enterprise should be determined from the cost per hour basis rather than the cost per day basis, which is sometimes used. The average number of hours worked per day by a farm work horse is approximately three.

TABLE V.—Annual rates of depreciation, farm machinery, expressed in percentages.

Machines	Northfield Rice County	Marshall Lyon County	Halstad Norman County	1,820 acre farm in Norman County	640 acre farm in Stevens County	Minn. Aver.
Grain binders	8.33	9.44	7.47	6.53	10.57	7.91
Grain drills and seeders	7.27	8.07	6.53	4.36	6.47	6.75
Corn binders	11.46	10.16	11.40	....	9.00	10.03
Corn planters	6.74	8.54	....	....	....	7.15
Corn cultivators	6.67	9.04	6.97	4.66	5.00	7.25
Mowers	7.25	10.01	6.97	7.28	8.93	7.80
Hay rakes	7.68	7.51	8.46	5.81	5.00	7.80
Gang plows	10.51	7.16	6.69	8.46	6.71	7.40
Sulky plows	10.27	11.93	5.77	....	3.70	8.42
Walking plows	4.77	7.29	7.64	....	8.82	6.09
Wagons	6.66	4.86	5.44	2.47	5.90	4.89
Harrows	11.01	8.20	7.93	8.89	6.78	8.72
Discs	5.41	7.46	....	3.35	7.50	5.19
Manure spreaders	10.50	12.59	....	....	10.00	11.67
Hay racks	14.57	14.89	10.30	5.12	....	7.76
Sleds	5.66	4.50	6.82	8.20	....	5.81
Fanning mills	5.00	4.97	3.66	3.33	....	4.58
Harnesses (heavy)	5.97	6.63	7.21	....	4.44	6.17

Note: The Minnesota average depreciation for each machine is determined from the depreciation charge on all the machines inventoried, and is not computed by averaging the depreciation charges for each county.

The average annual depreciation of grain binders is shown to be 7.91% or an average life of 12.6 years, that of corn binders, 10.03% or an average life of 9.9 years. The average annual depreciation of all classes of farm machinery shown in this table is approximately 7.29%.

APPROXIMATE NUMBER OF SEEDS PER POUND.

	No. per lb.
Corn, Minn. No. 13, average sample	1,700
Wheat, Minn. No. 169, average sample	16,600
Wheat, winter, Minn. No. 529, average sample	15,000
Wheat, macaroni, Minn. No. 843, average sample	13,200
Rye, winter, Minn. No. 46, average sample	17,200
Oats, Minn. No. 26, average sample	15,000
Oats, Minn. No. 6, average sample	14,700
Barley, Minn. No. 105, average sample	13,500
Peas, Canada field, average sample	2,780
Beans, Navy, average sample	2,140
Flax, Minn. No. 25, average sample	89,400
Alfalfa, average sample	226,000
Millet, Siberian red, average sample	225,000
Red clover, average sample	261,000
Alsike, average sample	702,000
Timothy, average sample	1,500,000

NUMBER OF HILLS PER ACRE.

Distance apart.	Hills per acre.
1 ft. x 1 ft.	43,560
1 ft. x 2 ft.	21,780
2 ft. x 2 ft.	10,890
2 ft. x 3 ft.	7,260
3 ft. x 3 ft.	4,840
3 ft. 6 in. x 3 ft. 6 in.	3,556
3 ft. 8 in x 3 ft. 8 in.	3,240
4 ft. x 4 ft.	2,722

WEIGHTS PER BUSHEL AND AMOUNT OF SEED TO SOW PER ACRE OF COMMON CROPS.—C. P. BULL.

	Lbs. Per Bushel.	Pecks Per Acre.	Quarts Per Acre.
Alfalfa	60	1	.....
Barley	48	7–9	.....
Beans	60	2–4	16–32
Buckwheat	48	3–4	.....
Can. Field Peas	60	8–12	.....
Clover—Red	60	.....	6–8
Clover—Alsike	60	.....	3–4
Corn (Shelled)	56	.....	4–6
Corn (Ear)	72	.....	.....
Emmer (Speltz)	40	10	.....
Flax (for seed)	56	2–3	.....
Flax (for fibre)	56	4–6	.....
Red Top (in chaff)	14	8–12	.....
Red Top (solid)	42	.....	3–6
Timothy	45	.....	8–12
Bromus inermis	14	5–6	.....
Millet	48	2–3	.....
Ky. Blue Grass	14	6–12	.....
Wheat	60	5–6	.....
Rye	56	5–6	.....
Potatoes	60	32–40	.....
Hemp	50	4	.....

It is here worthy of note that nowadays seed is being sold largely by the hundredweight instead of by the bushel as formerly. When bought by the cwt. the cost of feeding as well as the cost per pound is more readily figured; e.g., suppose barley is $1.15, corn is 85 cents and bran is $1.00 per cwt.; it is an easy matter to add these figures, point off and thus know what each pound is worth. Then by weighing the feed used per day, the cost of feeding the stock or of each individual head can be ascertained. Let us lay aside the awkward bushel, with varying weights, and adopt the more sensible standard of one hundred pounds.

AMOUNT, COMPOSITION AND VALUE OF MANURE PRODUCED BY DIFFERENT KINDS OF FARM ANIMALS.

(Results of Experiments conducted by Cornell Experiment Station.

Animal.	Food.	Analysis and Value Per Ton.					Amt. & Value Per 1,000 lbs. Live Weight.		
		% Water.	% Nitrogen.	% Phosphor. acid.	% Potassium.	Value Per Ton.	Lbs. Per Day.	Value Per Day.	Value Per Year.
Sheep	Hay, corn and oats; or hay, wheat bran, cottonseed meal and linseed meal	59.52	.77	9.39	.59	3.30	34.1	$0.072	$26.09
Swine	Skim-milk, corn meal, meat scraps or corn meal, wheat bran, and linseed meal	74.13	.84	.39	.32	3.29	83.6	.167	60.88
Cattle	Hay, silage, beets, wheat bran, corn meal and cottonseed meal	75.25	.43	.29	.44	2.02	74.1	.08	29.27
Horses	Hay, oats, corn meal and wheat bran	48.69	.49	.26	.48	2.21	48.8	.076	27.74

According to Prof. Roberts, of Cornell University, who conducted the above experiments, at least 50% of the fertilizing elements of manure is lost on the average farm under average conditions.

AVERAGE FARM PRICE OF GRAIN IN MINNESOTA. DEC. 1st, FOR 10 YEARS, 1898-1907. INCLUSIVE.

Year	Wheat	Oats	Corn	Hay	Barley	Flax
1898....	$0.54	$0.21	$0.24	$3.70	$0.33	.....
1899....	.55	.22	.24	4.35	.31	1.005
1900....	.63	.24	.29	6.95	.38	.....
1901....	.60	.34	.45	5.58	.45	.....
1902....	.61	.27	.40	5.36	.37	1.07
1903....	.69	.30	.38	6.61	.37	.83
1904....	.87	.26	.36	5.51	.32	1.01
1905....	.71	.24	.33	5.80	.32	.86
1906....	.65	.27	.34	5.50	.35	1.03
1907....	.92	.41	.50	7.50	.67	.98
Average 10 yrs.	.677	.276	.353	5.686	.387	.969

AVERAGE YIELD PER ACRE OF FARM CROPS IN MINESOTA FOR 10 YEARS, 1898-1907. INCLUSIVE.

Year	Wheat	Oats	Corn	Hay	Barley	Flax
1898....	15.8	36.3	32.0	1.80	28.4	....
1899....	13.4	32.0	33.0	1.70	25.0	10.3
1900....	10.5	25.2	33.0	1.16	22.4	....
1901....	12.9	32.1	26.3	1.55	25.8	....
1902....	13.9	39.0	22.8	1.76	28.6	10.4
1903....	13.1	32.3	28.3	1.84	25.3	9.9
1904....	12.8	39.2	26.9	1.74	28.4	10.8
1905....	13.3	37.5	32.5	1.75	27.0	11.3
1906....	10.9	32.5	33.6	1.70	28.0	11.0
1907....	13.0	24.5	27.0	1.70	22.5	10.5
Average 10 yrs.	12.96	33.06	29.54	1.67	26.14	10.6
Authentic yields average 10 yrs.	28.8	74.73	56.7	3.55	53.5	16.6

APPROXIMATE CAPACITY OF ROUND SILOS IN TONS.

Depth of Silo, Feet.	Inside Diameter, Feet. 10	12	14	16	18	20
20	26	38	51	67	85	105
21	28	40	55	72	91	112
22	30	43	59	77	97	120
23	32	46	62	82	103	128
24	34	49	66	87	110	135
25	36	52	70	92	116	143
26	38	55	74	97	123	152
27	40	58	78	103	130	160
28	42	61	83	108	137	169
29	45	64	88	114	144	178
30	47	68	93	119	151	187
31	49	70	96	125	158	195
32	51	73	101	131	166	205

SIZE OF SILO NEEDED FOR DIFFERENT SIZED HERDS.

Dimensions.	Capacity, Tons.	Acres to Fill at 10 tons per acre.	Cows it will feed 6 mo., 40 lbs. feed per day.
10x20	28	2.8	8
12x20	40	4.	11
12x24	49	5.	13
12x28	60	6.	15
14x22	61	6.	17
14x24	67	6.7	19
14x28	83	8.3	22
14x30	93	9.3	23
16x24	87	8.7	24
16x26	97	9.7	26
16x30	119	12.	29
18x30	151	15.	37
18x36	180	18.	45

—Modern Silage Methods.

INDIVIDUAL EAR TEST OF SEED CORN.

To make the individual ear test take a box 36 inches square and 6 inches deep; fill with sawdust, bran or sand, and moisten well. Take a cotton cloth (sheeting) large enough to completely cover top of box; mark off in 2-inch squares with a lead pencil and number squares. This makes 324 squares or space enough to test the seed needed on twenty acres.

Secure three or four 6-inch fence boards. Divide the boards into 2½-inch spaces by driving nails every 2½ inches and number the spaces. Select the best seed ears you have and with a knife remove 10 kernels from different parts of each ear, avoiding the tip and butt kernels. Place these ten kernels on square No. 1 in the box and place the ear on space No. 1 on the board. Treat each ear in the same manner, being careful to place the ear on the same space corresponding to number with the square in the box on which the

kernels were placed. In this manner it is easy to tell from which ear the kernels upon any one of the squares came.

Cover the box with a damp cloth and a little more sawdust and set away in a warm place, in the kitchen or living room, and keep moist, but not too wet. In five or seven days examine for germination. Note the number of kernels starting and vigor of growth. On square No. 10 you may find 10 kernels sprouted. This means that ear on space No. 10 will germinate 100%. On space No. 20 you may find only 8 kernels growing, which means 80% for ear No. 20. Not good enough for seed, so this ear may be discarded. No ear should be saved for seed that falls below 90%. The box should be examined from time to time and any ears that have not sprouted in 5 to 7 days under favorable conditions, should be discarded.

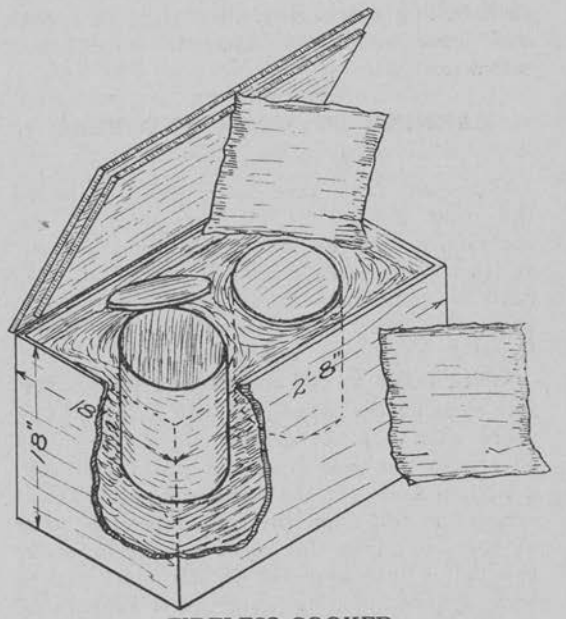
FIRELESS COOKER.

Mary L. Bull

The drawing shows a home-made fireless cooker, costing about $3.00. The box is made of pine lined with tin. Two small-sized lard cans are placed in the box, then packed about closely with wild hay. Two pads (flour sacks packed with wild hay) lie on top of the cans. These pads should be as thick as it is possible to have them and still allow the cover to close tightly. Excelsior, shredded paper and sawdust are some of the near-at-hand materials which may be used as packing. Mineral wool and excelsior mixed are considered best for this purpose. It is necessary that all the packing of the entire box be done very closely in

order that the heat of the boiling-hot food material in kettles, which is placed in the cans or pockets, be retained as long as possible.

An ingenious person may construct a fireless cooker that will do very successful work



FIRELESS COOKER.

with almost no outlay of money. (Select a close box, with tight-fitting cover, covered cans or pails of a size suitable to hold cooking vessels in use, packing of any of the afore-mentioned materials, and a fireless cooker is at hand.)

For preparing cereals and other foods requiring long, slow cooking they are excellent.

It is claimed for those sold on the market

that by their use the gas bill is reduced over one-half. Why not reduce the wood-consumption and also lessen the amount of heat in the kitchen, during the summer days at least.

To cook meat or oatmeal, place on stove until boiling thoroughly, then place in cooker and leave until just ready to serve; then warm up.

CANNING OF CORN AND PEAS.

J. L. Shepperd.

Corn and peas have long been considered the most difficult of all vegetables to can sucessfully. By the methods commonly used, at least some cans almost always spoil. The bacteria sometimes found upon these green vegetables are more resistant than those found in any other vegetable.

When ready to can corn, select ears in perfect roasting ear stage and with a sharp knife score each row of grains, cut a very thin slice from the ends of all the grains, and with a kitchen knife (or the back of a sharp knife) scrape the rest from the cob. For each quart of corn, put into the kettle a pint of water and half a tablespoonful of salt; put corn to cook and add boiling water as it evaporates. It should be as watery as commercial canned corn usually is. Let it cook for fifteen or twenty minutes after it actually boils all through. Watch and stir with a wooden spoon to prevent burning, but do not allow it to stop boiling.

When it has boiled for twenty minutes fill sterilized jars and seal. Then place the cans in a pan of hot water, having the water extend up to the rims and let it boil for one

half-hour, being sure that it does boil that length of time. The center of the can must reach the highest degree of heat possible, and they cannot reach that temperature unless the surrounding water is boiling all of the given time. Let the cans stand until the next day, then put them in a cold water bath and cook for half an hour after the water begins to boil; repeat the treatment on the third day. Tighten the covers if possible, while contents of jars are still boiling hot; wipe and set away where there is no draft and allow to cool.

The first boiling, if properly done, will kill the living germs, but the spores will remain unaffected. By the second and third days all the spores will have reached the vegetative stage, in which they reproduce, and may then be exterminated by continued boiling heat. If a single germ is left alive in the food after boiling, the canning will be a failure, because these invisible enemies of the housewife grow and multiply so rapidly that one left alive will speedily cause a large amount of food to spoil. This is the only sure process of canning this vegetable without the aid of chemicals. Success may sometimes attend the other methods, but a great deal of uncertainty must always exist. If no germs of this kind happen to be present all will be well, but if they are present, all is lost. Another favorable feature of this method is that as the cans are sealed all the time, there is no danger of contamination from the air or other sources after the canning process begins.

Canning Peas.

Pick the peas just before using; shell; cook half an hour, and salt as for the table; put in-

to sterilized jars and seal; then proceed exactly the same way as in canning corn.

To Can Corn and Tomatoes.

Corn and tomatoes may be successfully canned by cooking in an open kettle and sealing in the usual way. The greater the proportion of tomatoes to corn the better (it is usually supposed), because the inference is that the tomato being acid and watery offers not only less food material for germs, but offers the nutrients that are furnished, in a less desirable form than they are in corn alone. Experience has proved that equal parts of corn and tomatoes will keep well, and this makes a more palatable winter vegetable than does an excess of tomato.

Canning Pie Plant in Cold Water.

Owing to the large amount of acid and the small amount of proteid matter pie plant contains, it may be canned by the cold water method with a marked degree of success. The lack of food and the excess of acid in pie plant is not conducive to the growth of such germs as in most cases cause canned goods to spoil when not thoroughly sterilized by boiling, hence it will very generally, though not always, keep when put up cold. The advantages of this canning are that it is little trouble and expense, usually keeps well and makes pies almost if not entirely equal to fresh pieplant.

DAIRY FEEDING.

By T. L. Haecker.

Composition of Common Feeds.

Lbs.	Dry Matter.	Digestible Pro.	Digestible C. H.	Digestible Fat.
Spring Wheat Bran				
1	.88	.129	.40	.034
2	1.77	.258	.80	.068
3	2.65	.387	1.20	.102
4	3.54	.516	1.60	.136
5	4.42	.645	2.00	.170
6	5.31	.774	2.41	.204
7	6.19	.903	2.81	.238
8	7.08	1.032	3.21	.272
9	7.96	1.161	3.61	.306
10	8.85	1.290	4.01	.340
Corn.				
1	.89	.079	.67	.043
2	1.78	.158	1.33	.086
3	2.67	.237	2.01	.129
4	3.56	.316	2.67	.172
5	4.45	.395	3.33	.215
6	5.35	.474	4.00	.258
7	6.24	.533	4.67	.301
8	7.13	.632	5.34	.344
9	8.02	.711	6.00	.387
10	8.91	.790	6.67	.430
Oil Meal.				
1	.91	.293	.33	.07
2	1.82	.586	.65	.14
3	2.73	.879	.98	.21
4	3.64	1.172	1.31	.28
5	4.55	1.465	1.63	.35
Emmer (Speltz).				
1	.90	.091	.68	.021
2	1.80	.182	1.37	.042
3	2.71	.273	2.05	.063
4	3.61	.364	2.74	.084
5	4.51	.455	3.42	.105
6	5.41	.546	4.10	.126
7	6.31	.637	4.79	.147
8	7.22	.728	5.47	.168
9	8.12	.819	6.16	.189
10	9 02	.910	6.84	.210
Oats.				
1	.89	.092	.47	.042
2	1.78	.184	.94	.084
3	2.67	.276	1.41	.126
4	3.56	.368	1.88	.168
5	4.45	.460	2.35	.210
6	5.34	.552	2.82	.252
7	6.23	.644	3.29	.294
8	7.12	.736	3.76	.336
9	8.01	.828	4.23	.378
10	8.90	.920	4.70	.420

Lbs.	Dry Matter.	Digestible Pro.	Digestible C. H.	Digestible Fat.
Barley.				
1	.89	.087	.66	.016
2	1.78	.174	1.32	.032
3	2.67	.261	1.98	.048
4	3.56	.348	2.64	.064
5	4.45	.435	3.30	.080
6	5.35	.522	3.96	.096
7	6.24	.609	4.62	.112
8	7.13	.696	5.28	.128
9	8.02	.783	5.94	.144
10	8.91	.870	6.60	.160
Wheat Shorts.				
1	.88	.122	.50	.038
2	1.76	.244	1.00	.076
3	2.65	.366	1.50	.114
4	3.53	.488	2.00	.152
5	4.41	.610	2.50	.190
6	5.29	.732	3.00	.228
7	6.17	.854	3.50	.226
8	7.06	.976	4.00	.304
9	7.94	1.098	4.50	.342
10	8.82	1.220	5.00	.380
Red Clover Hay.				
1	.85	.068	.36	.017
2	1.69	.136	.72	.034
3	2.54	.204	1.07	.051
4	3.39	.272	1.43	.068
5	4.23	.340	1.79	.085
6	5.08	.408	2.15	.102
7	5.93	.476	2.51	.119
8	6.78	.544	2.86	.136
9	7.62	.612	3.22	.153
10	8.47	.680	3.58	.170
Fodder Corn.				
1	.58	.025	.35	.012
2	1.16	.050	.69	.024
3	1.73	.075	1.04	.036
4	2.31	.100	1.38	.048
5	2.89	.125	1.73	.060
6	3.47	.150	2.08	.072
7	4.05	.175	2.42	.084
8	4.62	.200	2.77	.096
9	5.20	.225	3.11	.108
10	5.78	.250	3.46	.120
Mangels.				
1	.09	.011	.05	.001
2	.18	.022	.11	.002
3	.27	.033	.16	.003
4	.36	.044	.22	.004
5	.45	.055	.27	.005
6	.54	.066	.32	.006
7	.63	.077	.38	.007
8	.72	.088	.43	.008
9	.81	.099	.49	.009
10	.90	.110	.54	.010

Lbs.	Dry Matter.	Digestible Pro.	Digestible C. H.	Digestible Fat.
Millet.				
1	.88	.032	.48	.01
2	1.76	.064	.97	.02
3	2.64	.096	1.45	.03
4	3.52	.128	1.94	.04
5	4.40	.160	2.42	.05
6	5.28	.192	2.91	.06
7	6.16	.224	3.39	.07
8	7.04	.256	3.88	.08
9	7.92	.288	4.36	.09
10	8.80	.320	4.85	.10
Timothy.				
1	.21	.009	.11	.007
2	.42	.018	.23	.014
3	.63	.027	.34	.021
4	.84	.036	.45	.028
5	1.04	.045	.56	.035
6	1.25	.054	.68	.042
7	1.46	.063	.79	.049
8	1.67	.072	.90	.056
9	1.88	.081	1.02	.063
10	2.09	.090	1.13	.070
Prairie Hay Mixed.				
1	.84	.029	.41	.012
2	1.62	.058	.83	.024
3	2.52	.087	1.24	.036
4	3.36	.116	1.66	.048
5	4.20	.145	2.07	.060
6	5.05	.174	2.49	.072
7	5.89	.203	2.90	.084
8	6.73	.232	3.32	.096
9	7.57	.261	3.73	.108
10	8.41	.290	4.15	.120
Corn Silage.				
1	.87	.028	.43	.014
2	1.74	.056	.87	.028
3	2.60	.084	1.30	.042
4	3.47	.112	1.74	.056
5	4.34	.140	2.17	.070
6	5.21	.168	2.60	.084
7	6.08	.196	3.04	.098
8	6.94	.224	3.47	.112
9	7.81	.252	3.81	.126
10	8.68	.280	4.34	.140
Alfalfa.				
1	.92	.11	.40	.012
2	1.83	.22	.79	.024
3	2.75	.33	1.19	.036
4	3.66	.44	1.58	.048
5	4.58	.55	1.98	.060
6	5.50	.66	2.38	.072
7	6.41	.77	2.77	.084
8	7.33	.88	3.17	.096
9	8.24	.99	3.56	.108
10	9.16	1.10	3.96	.120

NET NUTRIENTS REQUIRED FOR THE PRODUCTION OF MILK CONTAINING A GIVEN PER CENT OF BUTTER FAT.

T. L. Haecker.

Lbs. Milk	3% Fat in Milk. Pro.	C. H.	Fat.
1	.042	.189	.0133
2	.084	.378	.0266
3	.126	.567	.0399
4	.168	.756	.0532
5	.21	.945	.0665
6	.252	1.134	.0798
7	.294	1.323	.0931
8	.336	1.512	.1064
9	.378	1.701	.1197
10	.42	1.89	.133
Lbs. Milk	3.5% Fat in Milk. Pro.	C. H.	Fat.
1	.045	.211	.0149
2	.090	.422	.0298
3	.135	.633	.0447
4	.18	.844	.0596
5	.225	1.055	.0745
6	.27	1.266	.0894
7	.315	1.477	.1043
8	.36	1.688	.1192
9	.405	1.899	.1341
10	.45	2.11	.149
Lbs. Milk	4% Fat in Milk. Pro.	C. H.	Fat.
1	.048	.233	.0164
2	.096	.466	.0328
3	.144	.699	.0492
4	.192	.932	.0656
5	.24	1.165	.082
6	.288	1.398	.0984
7	.336	1.631	.1148
8	.384	1.864	.1312
9	.432	2.097	.1476
10	.48	2.33	.164
Lbs. Milk	5% Fat in Milk. Pro.	C. H.	Fat.
1	.054	.271	.0191
2	.108	.542	.0382
3	.162	.813	.0573
4	.216	1.084	.0764
5	.27	1.355	.0955
6	.324	1.626	.1146
7	.378	1.897	.1337
8	.432	2.168	.1528
9	.486	2.439	.1719
10	.54	2.71	.191

The above table shows the amount of nutrients required to produce 1, 2, 3, etc., up to 10 lbs. of milk, testing different percentages of fat.

To maintain a 1,000-lb. cow when she is not producing, that is, just to keep her alive and in good condition without gain or loss in weight, it requires approximately .7 lb. of protein, 7 lbs. carbohydrates and .1 lb. of fat. If she is giving 10 lbs. of 4% milk her requirements will be as follows. (See bottom row of figures under 4% milk.)

	Pro.	C. H.	Fat.
For maintenance	.7	7.	.1
For production of 10 lbs. milk	.48	2.33	.164
Total requirement.....	1.18	9.33	.264

If the same cow were to give 18 lbs. of 4% milk, her requirements for maintenance would be the same, and for milk production the requirements to produce 8 lbs. and 10 lbs. of milk would be added together, thus:

	a Pro.	C. H.	Fat.
For production 10 lbs. 4% milk	.48	2.33	.16
For production 8 lbs. 4% milk	.38	1.86	.13
For production 18 lbs. 4% milk	.86	4.19	.29
For maintenance.....	.7	7.	.1
Total requirement.....1.56		11.19	.39

RATIONS FOR DAIRY COWS.

T. L. Haecker.

When a cow's requirements are known it is a simple matter by using the tables on pages 29 to 31 to determine a ration that will supply them. Roughly speaking a cow requires about 1 lb. of grain for each 3 lbs. of milk she gives. A cow giving 10 lbs. of milk should get from

3 to 4 lbs. of grain per day, and one giving 18 lbs. of milk should get about six lbs. of grain per day.

RATIONS FOR A DAIRY COW GIVING 10 LBS. OF MILK TESTING 4% FAT.

	Pro.	C. H.	Fat.
Nutrients required	1.18	9.33	.264
Corn, 2 lbs.	.158	1.33	.08
Bran 2 lbs.	.258	.80	.06
Corn Silage, 30 lbs.	.27	3.40	.21
Clover Hay, 10 lbs.	.68	3.58	.17
	1.366	9.11	.52

	Pro.	C. H.	Fat.
Corn, 2 lbs.	.158	1.33	.08
Bran, 2 lbs.	.258	.80	.06
Clover Hay, 10 lbs.	.68	3.58	.17
Fodder Corn, 8 lbs.	.20	2.77	.096
Mangels, 10 lbs.	.11	.54	.01
	1.406	9.02	.416

	Pro.	C. H.	Fat.
Barley, 2 lbs.	.174	1.32	.032
Bran, 2 lbs.	.258	.80	.06
Clover Hay, 10 lbs.	.68	3.58	.17
Fodder Corn, 8 lbs.	.20	2.77	.096
Mangels, 10 lbs.	.11	.54	.01
	1.422	9.01	.368

RATIONS FOR A DAIRY COW GIVING 18 LBS. OF MILK, TESTING 4% FAT.

	Pro.	C. H.	Fat.
Nutrients required	1.56	11.19	.39
Corn, 4 lbs.	.316	2.67	.172
Bran, 2 lbs.	2.58	.80	.068
Corn Silage, 30 lbs.	.27	3.40	.21
Clover Hay, 12 lbs.	.816	4.30	.20
	1.66	11.17	.65

	Pro.	C. H.	Fat.
Corn, 4 lbs.	3.16	4.30	.20
Bran, 2 lbs.	2.58	.80	.068
Clover Hay, 12 lbs.	.816	4.30	.20
Fodder Corn, 7 lbs.	.175	2.42	.08
Mangels, 10 lbs.	.11	.54	.01
	1.675	10.73	.53

	Pro.	C. H.	Fat.
Barley, 4 lbs.	.348	2.64	.064
Bran, 2 lbs.	.258	.80	.06
Clover Hay, 12 lbs.	.816	4.30	.20
Fodder Corn, 10 lbs.	.25	3.46	.12
	1.672	11.20	.444

DAIRY CALF BREEDING.

Carl Gaumnitz.

At birth the calf has meconium in the stomach and intestines, therefore the first food should be laxative in character in order to remove this before it is absorbed. Nature has provided the food suited to this purpose in the form of colostrum milk (the first milk the cow gives). It seems best to leave the calf with its mother for about two days, thus giving him a good start in life, and thereafter he should be fed as outlined in the following table.

The change to skim milk should be very gradual, taking two to three weeks, so as to give the calf's stomach time to adjust itself to the new feed.

The calf should be offered ground grain just as soon as he gets through drinking his milk. To teach him to eat, the grain should be put in his mouth when he tries to suck your hand. A mixture of ground grain and bran with milk makes a good ration. Oil meal or flax seed meal is not necessary when feeding skim milk. Oats contain a large quantity of fiber which is too hard and harsh for the young calf to digest.

He should be taught to eat grain and hay up clean. This is done by not giving him more than he can eat (a simple way). Feed should always be fresh and clean. He likes to pick up wisps of hay and eat them, so give him nice fine hay—early cut second crop is best—it is more economical and palatable.

Scours in calves are caused mostly by violent changes in temperature, quantity and quality of milk fed, and by infection. Therefore the temperature of milk fed should be as near 98° F. as possible; this is very important; and milk should be sweet and fed from clean pails—not slop pails. When this is done scours do not often occur.

If scours do occur milk should be decreased one-half and water added to make the original amount. This should be done until scouring ceases. A teaspoonful of a solution of formalin (1 part formalin to 1400 parts water) to every pound of milk fed may be added.

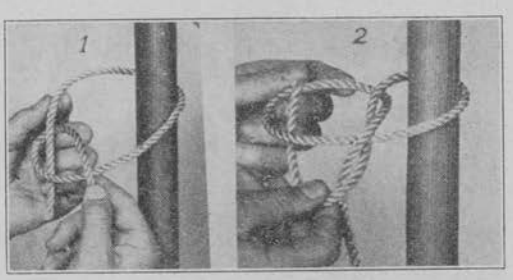
FEED PER DAY FOR CALF AT DIFFERENT AGES.

Age.	Approx. Wt. of Calf.	Whole Milk.	Sweet Skim Milk.	Grain.	Hay
1-2 days.....	60 lbs.	suck	0	0.	0.
1st week.....	60 lbs.	6 lbs.	0	0.	0.
2nd week.....	65 lbs.	4 lbs.	2	.2	.2
3rd week.....	70 lbs.	3 lbs.	4	.3	.3
4th week.....	75 lbs.	1 lb.	6	.4	.4
5th week.....	80 lbs.		8	.5	.5
6th week.....	90 lbs.		9	.6	.6
7th week.....	100 lbs.		10	.7	.7
8th week.....	110 lbs.		11	.8	.8
9th week.....	120 lbs.		12	1.0	1.0
10th week.....	130 lbs.		12	1.2	1.2
11th week.....	140 lbs.		12	1.4	1.4
12th week.....	150 lbs.		11	1.5	1.6
13th week.....	160 lbs.		10	1.6	2.0
14th week.....	170 lbs.		10	1.7	2.0
15th week.....	180 lbs.		10	1.8	2.2
16th week.....	190 lbs.		10	1.9	2.2
17th week.....	200 lbs.		10	1.9	2.2
18th week.....	210 lbs.		10	2.0	2.5
19th week.....	220 lbs.		10	2.2	2.5
20 weeks 5 mo...	230 lbs.		10	2.3	2.5
21st week.....	240 lbs.		8	2.5	2.5
22nd week.....	250 lbs.		6	2.5	2.5
23rd week.....	260 lbs.		3	2.5	3.0
24th week.....	270 lbs.		0	2.5	3.0
25th week.....	280 lbs.		0	2.7	3.0
26th week.....	290 lbs.		0	2.7	3.0
27th week.....	300 lbs.		0	3.0	3.0

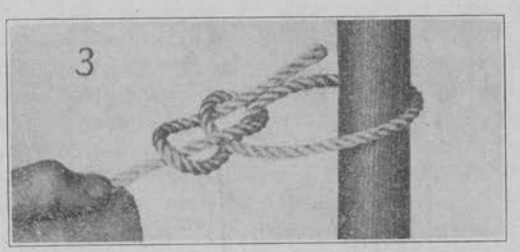
THE BOW LINE KNOT.

J. M. Drew.

This is one of the most useful knots known to the sailor. It does not slip nor become

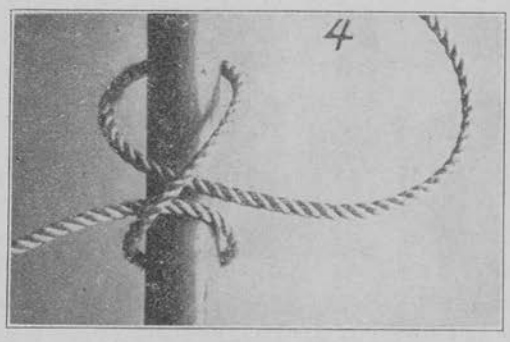


loose of itself, and no matter how much strain is put upon it, it never becomes jammed so that it cannot be easily untied. For fastening the hay-fork rope to the whiffletrees or tying



a rope around an animal's neck, this knot cannot be excelled. To tie the bowline, place the rope around the object to be tied so that the loose end is in the left hand. Cast an overhand loop in the main part of the rope and put the end of the rope down through this loop, as in Fig. 1. Then pass the end around the

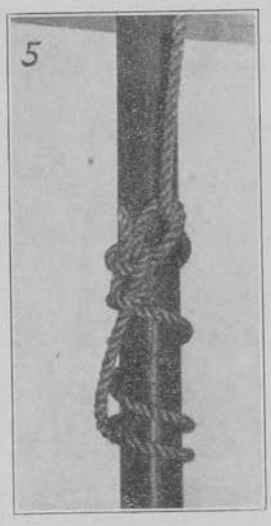
main rope and **up** through the loop, as in Fig. 2. Now pull on the main part of the rope and the completed knot will look like Fig. 3.



CLOVE HITCH.

Fig. 4 shows what is known as the Clove Hitch. It is a good knot to use in case a horse is to be hitched to a pole, pipe or post which has no ring to keep the rope or strap from slipping down. The ordinary halter knot tied in a case of this kind will often allow the rope or strap to slide down so that the horse may get his foot over it. The cut shows plainly how the hitch is made.

Fig. 5 shows a hitch used in pulling a pipe out of a well or for hitching to any smooth object which is to be pulled endwise. To make this hitch, first make a loop in one end of the rope and pass it several times around the object, (going in the opposite direction from the way the pull is to be exerted), then put the other end of the rope through the loop.



THE LONG SPLICE.

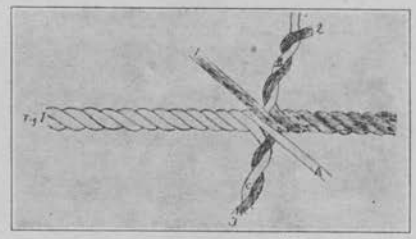
J. M. Drew.

The accompanying cuts show how to make what sailors call the "long splice" in a rope.

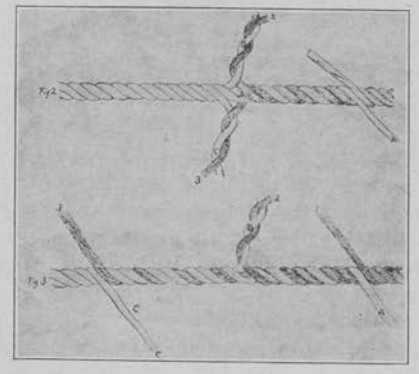
The length of a long splice should be about 100 diameters of the rope for large rope and 80 diameters for small rope.

Suppose we have a splice to make in a ¾-inch hay fork rope. Unravel each rope for a distance of about three feet, and set them together in such a way that each of the unravelled strands shall be between two strands of the opposite rope. Now twist adjacent strands together in pairs as in Fig. 1. This twisting is done to avoid confusion and tangling and is no part of the splicing proper. In the cut one rope

is represented as black, and the other white to make the operation more plain, and the strands of the black rope are numbered 1, 2 and 3,

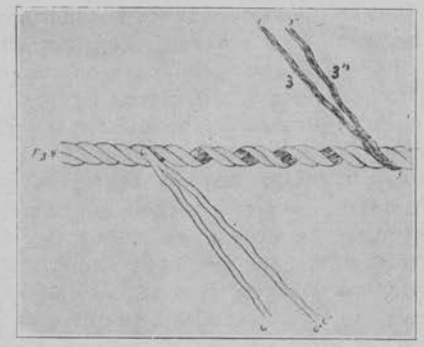


and those of the white rope are lettered A, B and C. After twisting B and 2, and C and 3 together in pairs, proceed with the splicing by

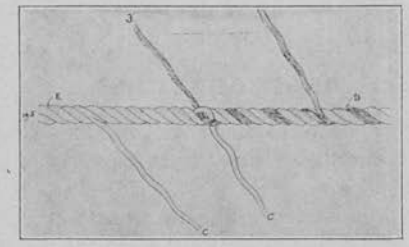


unlaying strand 1 a turn or two and laying strand A in its place; continue this process for a distance of about 2½ feet and leave as in Fig. 2. These figures are shortened to save space and the strands are shown much shorter

than they would be in the real rope. Next unlay C and lay 3 in its place, the same distance as in the case of A and 1. Each pair of strands



is now to be subjected to the following treatment: For convenience we will take strands 3 and C. Unlay each of these strands and slip in halves as in Fig. 4; then lay one-half of each



strand back where the whole strand came from and tie as in Fig. 5. Be very careful to tie exactly as shown in the figure, that is, have C pass around 3 so that when pulled down tight they will form a smooth strand and not be

lumpy, as they are sure to be if put around each other the wrong way.

Continue to tuck C around 3 till just past the place where strand 3 was split (point D in the cut), then in the same manner tuck 3 around C till the point E is reached. Now cut off the ends of the half strands about a quarter of an inch from the rope. After treating the other two pairs of strands in the same manner, the splice will be complete.

Two or three precautions are necessary to be observed in order to make a smooth splice. Be sure that the strands are set together properly at the start so that each strand goes in between two strands from the opposite rope. In replacing one strand with another, be sure to give the same amount of twist as it had in the original rope.

After tying the half strands and beginning to tuck one around the other, pull on both to draw up tight, otherwise a bunchy loose place will be left.

GRASS MIXTURES.

For rotation pastures and meadows sow 8 lbs. of timothy, 4 lbs. of red clover and 2 lbs. of alsike clover.

For highland permanent meadows or pastures sow 8 lbs, of bromus, 4 lbs. of red clover and 2 lbs. of alsike clover, or sow 15 lbs. of Kentucky blue grass, 4 lbs. of red clover and 2 lbs. of alsike clover.

For lowland meadows or pastures sow 8 lbs. solid red top seed and 4 lbs. alsike clover.

AMOUNT OF NITROGEN, PHOSPHORIC ACID (P_2O_5), AND POTASH (K_2O) REMOVED IN ONE DOLLAR'S WORTH OF FARM PRODUCTS.

Product.	Average Price.	Pounds sold for $1.00.	Nitrogen in $1.00 worth.*	Lbs. P_2O_5 in $1.00 worth.*	Lbs. K_2O in $1.00 Worth.*	Value of N. at 17c per lb.	Value of P_2O_5 at 6c per lb.	Value of K_2O at 5c per lb.	Total value.	Value of P_2O_5 and K_2O.
Wheat	.677	88.6	1.94	.88	.53	.33	.052	.026	.408	.078
Oats	.276	115.	2.53	.92	.53	.43	.055	.031	.516	.086
Barley	.387	129.	1.8	1.15	.70	.31	.069	.035	.414	.104
Corn	.353	158.	1.73	1.10	.63	.29	.066	.031	.387	.097
Flax	1.094	51.	2.36	.81	.35	.40	.048	.017	.465	.065
Potatoes	.334	179.	.77	.26	.98	.13	.015	.049	.194	.064
Hay	5.15	389.	.0	3.10	6.80	.00	.186	.34	.526	.526
Butter	.20	5.	.0025	.0025	.0025	.0004	.0001	.0001	.0006	.0002
Milk (gal.)	.08	100.	.5	.15	.15	.09	.009	.007	.106	.016
Beef	4.42	22.	.58	.40	.03	.10	.024	.001	.125	.025
Pork	4.93	20.	.4	.16	.03	.07	.009	.001	.080	.010
Mangels	1.75	1120.	4.2	1.96	7.50	.71	.117	.375	1.201	.492

*Compiled from Prof. Snyder's "Soils and Fer-tilizers."

EXPERIMENTS WITH TREATING FENCE POSTS.

Sixteen sets of 5 each were treated as follows and set in moist soil between two irrigation ditches. Posts set April 15, 1891, dug up June 27, 1907, a period of 16 years, 2 months, and 12 days; all posts were pitch pine. Notes given in table judged from appearance of posts, those being sound and solid would last up to thirty years or more.

FENCE POST EXPERIMENT.

No. Set.	Treatment	No. whole	No. broken	Condition at bottom %	Condition at ground surface %	Condition of top %	Notes.
1.	Coal tar, 2½ ft. bottom	4	1	100	65	85	1 gone at 15 years; 4 would last 20 years.
2.	No treatment...	2	3	30	12	85	3 gone at about 12 years; 1 would last 17 years; 1, 18 years.
3.	Crue oil, 2½ ft. base	5	0	95	25	12	2 would last 20 years; 3 perhaps 30 years.
4.	Tar band, 1 ft. wide	3	2	75	50	95	2 good as new; 1, 20 years; 2 about 12 years.
5.	Crude oil band, 1 ft. wide, 30 in from base..	5	0	95	90	98	4 good as new; 1 good for 25 years.
6.	Crude oil, 2½ ft. from base, burned off....	5	0	100	98	85	All 5 good as new.
7.	Tar, 2½ ft. and burned	5	0	60	50	95	1 good as new; 4 would last 20 years or more.
8.	Crude oil, band 18 in. from base —burned off..	2	3	60	15	90	1 good for 18 years; 3 broken, 4 years; 1 gone this year.
9.	No treatment...	4	1	40	35	90	1 good for 25 years; 3 gone now; 1, 17 years.
10.	Tar band, 18 to 30 in. from base —burned off..	3	2	5	40	85	2 good for 20 years; 2, 14 years, 1, 16 years.
11.	Tar, 12 in. base.	5	0	75	50	95	All would stand 25 years.
12.	Tar, 12 in. base and burned...	4	1	50	40	80	2 would last 20 years; 3, 18 years.
13.	No treatment...	2	3	00	7	80	1 might stand 17 years; 2, 16 years; 2, 14 years.
14.	Charred 2½ ft. from base.....	4	1	70	65	90	2, 25 years; 1, 17 years; 2, 20 years or more.
15.	Crude oil, 12 in. base	2	3	...	40	90	2 good for 20 years; 1, 16 years; 2, 15 years.
16.	Crude oil, 12 in. base—burned..	2	3	...	30	90	2 may last 20 years; 2 gone this year; 1 gone 2 years ago.

Extra taken from the Seventeenth Annual Report by B. C. Buffum, Wyoming Exp. Station.

FARM FACTS.

If it is desired to sow some legume crop in the grain, with a view of plowing it under in the fall, sow 2 to 4 lbs. of medium red, mammoth or crimson clover.

Sow grass seed early in the spring on firm, mellow, rich, moist soil.

On light sandy or sandy loam soils, sow grass seed with the drill, as it is less likely to dry out in dry seasons.

Grass crops, especially clovers, are our most valuable soil-building crops, as their extensive root systems open up the subsoil and increase the supply of humus.

It costs less than four dollars to grow and save an acre of hay, while it costs from $8.00 to $11.00 to grow an acre of corn.

DOMESTIC SCIENCE BOX.

Domestic Science Department, Minnesota Agricultural College.

The Domestic Science Box is designed for use in rural schools in giving some simple lessons in cookery. Accompanying the box is a list of bulletins which may be obtained on application, free of charge, from the Department of Agriculture, Washington, D. C. These bulletins contain information regarding the nutritive and money value and combination with other foods, etc., of the food materials selected to be used in these simple lessons. There is also a list of lessons, such as may be easily demostrated. The outlay in money for such a box is about $5.00, and $5.00 more will procure a one-burner gasoline stove with

small oven. For the sum of $10.00 and the proper disposition on the part of the teacher, the children of the rural schools might learn to enjoy the art of cookery and find something of interest in the study of the products of their own homes as well as being able to appreciate the many blessings of rural life. For instance, different varieties of potatoes from different farms might be studied and discussed by the boys, showing the results of various methods of planting, cultivating, etc. Then some of each variety should be cooked in the same manner, length of time, etc., and the girls allowed to judge of their merits or demerits from the standpoint of the housewife. How better make a profitable half-holiday of Friday afternoon?

MATERIALS FOR GARMENTS.

Mrs. Margaret J. Blair.

Underwear: Longcloth, lonsdale, Berkeley, Jones, nainsook.

Work dress: Percales, ginghams, prints; 10 to 12 yards.

House dress: Dimity, French gingham, linen; 10 to 12 yards.

Shirt waists; Pique, madras, linen, mercerized cotton; 2½ to 3½ yards; according to width.

Evening gowns: Crepe, wool or silk, soft silks; 18 yards. India linen, Persian lawn, organdy, mull; 10 to 12 yards.

Street dress: Broad cloth; 6 to 7 yards; panama, 8 yards; serge, 8 yards; Scotch tweed, 7 to 8 yards.

All goods should be shrunk before being

made into garments. Cottons and linens should be put into a tub of warm water and hung on the line in folds so they will not get out of shape. When shrinking wool, wet a sheet and lay in the folds of material, roll upon a round stick and let it lay over night and press on the wrong side.

What to Avoid: Always avoid large plaids and stripes. Also bright colors in cotton materials. Avoid the short threads in linens, which can easily be seen by rubbing the linen, and if it rubs up this shows that there are short threads mixed with the long ones.

Avoid transparent spots in cotton on account of the dead cotton which will not wear well.

Avoid artificial silks and stiff silks which will crack.

Avoid artificial wools as they are made up of short threads and old knotted goods.

RUGS.

Bed room rugs may be made of rags and will be beautiful if the rags used harmonize in color. They are the most desirable from a sanitary as well as an artistic standpoint. If possible, use small rugs, as they are so easily cleaned. But a large room requires a larger rug. But whatever its size, avoid large figures and strong colors, choosing rather a small, somewhat indistinct pattern, using the deeper shades of the other decorations of the room.

HANDY DEVICES.

L. B. Bassett.

Fig. 1 represents a handy device for pulling

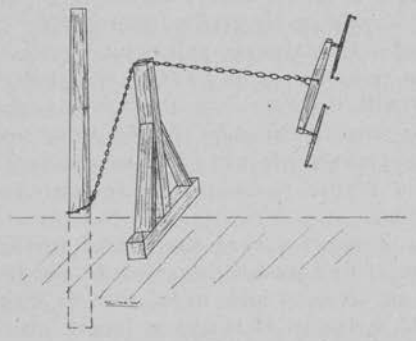


FIG. 1.

posts. The bed or sill is made of 4x4—3 ft. in length. The upright is a piece of 4x4—2½

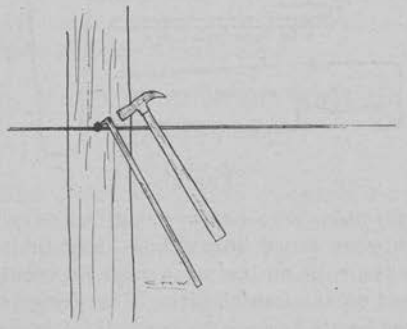


FIG. 2.

ft. in length. The braces are made of 2x4's mortised in at the sill and also at the junction formed with the 4x4 upright. A chain with

ring in one end and a hook in the other makes the best hitch. This is looped around the post at the surface of the ground and the hook end engaged in the clevice on the evener. If the post does not come out the first pull the chain should be lowered to the surface of the ground before another pull is made. Two men and a team can pull posts very rapidly and easily with this hitch. It is not even necessary to dig around the edge of the posts with a spade as in the old way. We have even pulled up old corner posts that were anchored in 4 ft. deep.

Fig. 2 shows a very handy tool for pulling staples. Any blacksmith can make one from a piece of steel ½ inch or ¾ inch in diameter and 10 inches to 14 inches in length.

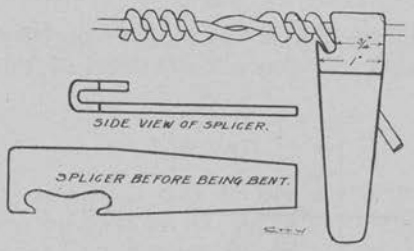


FIG. 3.

Every man who has ever put up very much woven wire fence knows how difficult it is to splice the rolls so the strain will be evenly distributed on the lateral wires. The device shown in Fig. 3 will be found very helpful indeed for making these splices. This splice can be made by any blacksmith at a cost not to exceed 20 to 25 cents. A piece of steel one inch wide at the large end and tapering to ½ inch in

width at the lower end, ⅛ inch in thickness and 8 inches in length will suffice. The notch which holds the wire should be slightly concave to keep the wire from slipping out.

GROUND FENCE WIRES.

Every farmer who is keeping stock enclosed by wire fences can reduce the chances of loss by lightning by grounding his wire every 20 or 30 rods. Telephone companies, in order to prevent damage by lightning, think it necessary to ground their wires every few poles.

As a general rule, cattle or horses during a storm will huddle together with their backs to the storm and heads over or through the fence.

Lightning often hits the fence many rods from the cattle, follows the wire along and sometimes kills several animals at once. Every wire fence should be grounded at least every 30 rods. Each lateral wire should come in contact with the ground wire and the ground wire should be buried to a depth of 3 ft. or deep enough to find moist earth.

THE KIND OF HORSES RAISED IN MINNESOTA.

Andrew Boss.

Stallion owners are now required by **State Law** to have their stallions licensed by the Stallion Registration board, St. Anthony Park, Minn. This law went into effect April 25th, 1907. On April 1st, 1908, there were licensed in the state 2,749 stallions. Of these 1701 or 61.8% were grades and 1,048 or 38.2% pure breds.

The table shows the breeds represented as compiled by the secretary of the board.

Licensed Stallions in Minnesota, April 1st, 1908

Name of Breed.	No. Licensed.	
	Pure Bred.	Grade.
Draft Horses—		
Percheron	568	711
Belgians	110	144
Clydesdales	65	79
French draft	63	77
English shires	40	122
Suffolk	2	
Light and heavy harness horses—		
American trotters	135	136
Morgans	10	53
German coach	25	18
French coach	18	13
Cleveland bay	5	3
Hackney	5	6
Shetland Ponies	2	3
Arabians		6
Unknown Breeding		314
Jacks		16
	1048	1701

HORTICULTURAL AND FORESTRY NOTES.

Some of the Most Common Diseases and Other Troubles Affecting Fruits, with Their Treatment and Prevention.

A. R. Kohler.

Apples.—Apple Scab—Causes the leaves to become badly spotted and the fruit to become gnarly and affected with large scab-like spots. Use Bordeaux mixture. The best single application is just before the blossoms open. Other applications may be made just as the buds are bursting, after the blossoms fall, two weeks later and in late July or early August.

Sun Scald.—Kills the bark on the trunks of young trees on the south or southwest side. Cover the bark on the trunks during winter by tying cornstalks or burlap around the trunk, by wrapping with wood veneer or by boxing up, anything that will shade the trunk, but do not use tar paper.

Root-killing often kills young trees within first few years after set out. Buy trees that are grown on hardy roots. Mulch around the tree with straw and half a foot of manure during winter.

Mice and Rabbits often gnaw the bark and girdle the trees. Prevent by banking up with a foot of earth in fall and wrapping rest of trunk with wood veneer or something that will keep them off. Tramp snow down around each tree after a heavy fall of snow. If already injured, dress wound and mound up to cover with earth. If completely girdled, cions must be stuck in to connect the bark above and below the injury.

Blackberries.—Cane rust or Anthracnose causes numerous quite distinct spots on the canes and weakens them. Remove and burn all old canes soon after fruiting. Spray young canes in Spring when six inches high with Bordeaux and repeat occasionally. If badly infested, cut down all growth in fall and burn.

Raspberries, Same as Blackberries.

Currant.—Anthracnose and Leaf Spots—Causes spots on foliage and leaves often fall early. Spray with Bordeaux while leaves are small, again when fruit is half grown and after fruit is picked.

Gooseberries.—Same enemies and treatment as currants.

Grapes.—Black rot.—Causes berries to rot, shrivel, dry up and turn black. Keep all diseased fruit removed and destroyed. Spray with Bordeaux when the leaves are one-third grown and just after the fruit sets. If bad, other applications may be made just as the buds are bursting, before flowers open and two more, ten to twenty days apart after the fruit sets, but not so late that fruit will be discolored when picked.

Brown Rot or Mildew.—Same treatment as for Black Rot will be quite effective.

Plums.—Brown Rot—Causes plums to turn brown, shrivel and dry up. Use Bordeaux mixutre. Make the first application just before blossoms open, and other applications just after the blossoms fall, about two weeks later and in the latter half of June. For later applications when Bordeaux would discolor fruit use Ammoniacal Copper Carbonate and Soap. It is safer to use Bordeaux mixture containing only three pounds blue vitriol and four pounds lime to 50 gallons water for plums while in leaf.

Plum Pocket—Causes enlarged plums without a pit or stone. Prune out the limbs that bear plum pockets. Spraying with one pound of blue vitriol to 25 gallons of water (without lime) in late winter while the trees are still dormant is helpful.

Black Rot—Causes large, black warty swellings on smaller branches. Prune it out.

Strawberries.—Rust or Leaf Spot—Causes the leaves to become badly spotted with rust-like spots. Use Bordeaux mixture when growth begins and as often after that as necessary.

BORDEAUX MIXTURE.

The common formula for Bordeaux mixture for fruits is four pounds blue vitriol, four pounds fresh, high grade stone lime, which slacks readily and uniformly and fifty gallons of water. Dissolve the blue vitriol by hanging it in the top of a five-gallon keg or bucket of water. (Do not use metal ware.) Slack the lime. When both are dissolved dilute each to 25 gallons and pour the two together into the spraying barrel at the same time.

Where large quantities are used, stock solutions of each ingredient may be prepared. A saturated solution of blue vitriol contains three pounds to the gallon. Lime may be made up in equal proportion. When ready to mix up a batch of Bordeaux mixture take enough of the stock solution of each to make up the required quantity of each ingredient, dilute as above and mix. Great care must be exercised to stir the lime mixture thoroughly before the required amount is taken out or there will be great danger of burning the foliage. Stock solutions of lime should not be kept over a month and should be kept covered to prevent evaporation.

Bordeaux mixture can be made to take the place of water in the formulae for arsenical poisons without weakening its effect as a fungicide.

SOME ESSENTIALS TO SUCCESS IN SPRAYING.

To be sure of success with spraying it is necessary to (1) keep the liquid well stirred,

(2) use high pressure, 60 to 100 pounds, (3) use good nozzles (Vermorel are best), (4) strain everything well that goes into the spraying machine, and (5) keep all parts clean and in good order.

AMMONIACAL COPPER CARBONATE AND SOAP.

Formula: Copper carbonate, 6 ounces.
Ammonia, strong (26° Baume), about 3 pints.
Soap, 1 pound.
Water, 50 gallons.

Add a quart or two of water to the ammonia, pour over the copper carbonate until dissolved, and dilute to 40 gallons. Dissolve the soap in 10 gallons of water and pour into the above solution.

Prepare only as needed.

SEX IN STRAWBERRY PLANTS.

Some varieties of strawberries produce sufficient pollen to set their own fruit. These are called perfect flowered or bi-sexual varieties. They do not need to have any other variety near them in order to produce fruit.

Other varieties produce very little or no pollen and cannot set fruit without the aid of a pollen producing variety. They are called imperfect or pistillate varieties. A bi-sexual variety must be planted between every two or three rows of a pistillate variety.

FORMULA FOR GRAFTING-WAX.

An all around useful wax is made according to the following formula:

Resin, 4 parts.
Beeswax, 1 part.
Beef tallow, 1 part.

Mix the ingredients in an iron kettle and place over the fire. Continue to heat it and stir for at least 20 minutes after all parts seem melted, then pour into a pail of cold water, pull like taffy until of fine grain. Keep hands greased.

To make a harder wax, use more resin. To make it softer, add more tallow.

FRUIT LIST.

Varieties adopted Dec. 5, 1907, by the Minnesota State Horticultural Society for Minnesota planting. Season added after the variety name.

Apples.

Of the first degree of hardiness: Duchess, summer; Hibernal, late autumn and early winter; Charlamoff, late summer; Patten's Greening, late autumn and early winter; Okabena, late summer and early autumn.

Of the second degree of hardiness: Wealthy, November to January; Tetofsky, summer; Malinda, late winter; Peerless, late autumn and early winter; Anisim, November to January.

Most profitable varieties for commercial planting: Wealthy, Duchess, Patten's Greening, Okabena, Anisim.

Varieties for trial: Salome, early winter; Eastman, Yellow Sweet, summer; Brett, autumn; Milwaukee, late autumn and early winter; University, late autumn and early winter; Newell, winter; Lowland Raspberry, summer; Iowa,

Beauty, late summer; Jewell's Winter, winter; Gilbert; late summer.

Valuable in some locations: Wolf River, late autumn and winter; McMahon, late autumn and early winter; Yellow Transparent, summer; Longfield, autumn and early winter; Northwestern Greening, winter.

Crabs and Hybrids.

For general cultivation: Florence, Whitney, Early Strawberry, Minnesota, Sweet Russet, Virginia, Transcendent.

Varieties for trial: Lyman's Prolific, Faribault, Shields.

Plums.

For general cultivation: DeSoto, Surprise, Forest Garden, Wolf (freestone), Wyant, Stoddard.

Most promising for trial: New Ulm, Brittlewood, Compass Cherry, Terry.

Grapes.

First degree of hardiness: Beta, Janesville.

Second degree of hardiness: Moore's Early, Brighton, Delaware, Worden, Agawam, Concord, Moore's Diamond.

Raspberries.

Red varieties: King, Turner, Marlborough, Miller, Brandywine, Loudon.

Black and purple varieties: Palmer, Nemaha, Gregg, Older, Columbian, Kansas.

Blackberries.

Ancient Briton, Snyder.

Currants.

Red Dutch, White Grape, Victoria, Long Bunch, Holland, North Star, Pomona, Red Cross, Perfection, London Market.

Gooseberries.

Houghton, Downing, Champion, Pearl.

Strawberries.

Perfect varieties: Bederwood, Enhance, Lovett, Splendid, Glen Mary, Clyde, Senator Dunlap.

Imperfect varieties: Crescent, Warfield, Haverland.

Native Fruits.

Valuable for trial: Dwarf Juneberry, Sand Cherry, Buffalo Berry, High Bush Cranberry.

DISEASES AFFECTING THE POTATO, AND THEIR TREATMENT.

Early Blight—Usually begins to affect the foliage some time in June and may be more or less active during the remainder of the season. It is most injurious to early varieties. Spray with Bordeaux, using 5 pounds blue vitriol and 5 pounds stone lime to 50 gallons of water. Make the first application when the plants are about eight inches high and repeat every two or three weeks as often as seems necessary. This disease is apt to be confused with the burning of the margins of the leaves that is very likely to result in hot, dry weather when potatoes are grown on sandy land.

Late Blight—This disease may appear at any time during warm, damp, muggy weather, after the early part of August. It usually begins on the lower parts of the plant and works towards the top, causing the diseased parts to wilt, turn black and die. In its severest form it will destroy a whole patch of potatoes in apparently two or three days. It is not common in this state. The remedy is to use Bordeaux mixture (5-5-50) before the disease appears and repeat every two or three weeks during

the rest of the growing season, according to the weather,—more often when warm and wet. less often when dry.

Rot.—If the rot results from late blight, the control of the blight will usually prevent much rot. If the rot is Internal Brown Rot, Fusarium, which is very common and often very destructive in this state, spraying of the foliage will be of no benefit so far as now known. Plant seed absolutely free from infection and avoid diseased land so far as possible. Rot is usually worse on low, wet land than on well drained soil.

Scab.—Dip the seed tubers, before cutting, into a formalin solution for two hours, or into a corrosive sublimate solution for 1½ hours. Let them down into the barrel right in the sack. The tubers must either be planted soon after treating or spread out to dry. Avoid diseased land. Do not apply manure from animals that have been fed on scabby potatoes.

FORMALIN SOLUTION.

1 Pint commercial formalin (40%).
30 Gallons of water.

This will treat about 20 bushels of potatoes.

CORROSIVE SUBLIMATE SOLUTION.

2 Ounces corrosive sublimate (powdered).
15 Gallons water.

Dissolve the corrosive sublimate in two gallons of hot water and dilute to 15 gallons.

This solution can be used almost indefinitely. Keep covered to prevent evaporation. It

corrodes metal ware. Use wooden or crockery ware.

Caution!—Corrosive sublimate is a very deadly internal poison. Cover the barrel or tank securely to keep all stray animals from drinking the solution. Treated tubers are also poisonous and if eaten the animal will die.

POTATO VARIETIES.

Early.—Early Ohio is most grown. Other varieties are Eureka Extra Early, Early Harvest, and early Michigan, if soil is good.

Medium and Late.—Carman No. 3 for a long potato, and for round stock, Sir Walter Raleigh, Rural New Yorker No. 2 and White Beauty. Russet is a promising new, russet-skinned, long potato of high quality, but not yet of commercial standing.

GARDEN SEEDS.

Longevity When Properly Cured and Stored.

Kind.	Yrs.	Kind.	Yrs.
Bean	3	Okra	5
Beet	6	Onion	2
Cabbage	5	Parsnip	2
Carrot	4 or 5	Parsley	2
Cauliflower	5	Pea	3
Celery	8	Pepper	4
Cress, Com. Garden	5	Pumpkin	4 or 5
Cucumber	10	Radish	5
Egg-Plant	6	Rhubard	3
Endive	10	Salsify	2
Kohlrabi	5	Spinach	5
Leek	3	Squash	6
Lettuce	5	Sweet corn	2
Musk Mellon	5	Tomato	4
		Turnip	5
		Watermelon	6

AMOUNT OF SEED REQUIRED.

Artichoke (Jerusalem), 3 bushels of tubers per acre.

Asparagus, 1 oz. to 60 ft. of drill; 4 to 5 lbs. per acre.

Beans, (dwarf), 2 bu. to the acre in drills; 1 pint to 50 ft. of drill.

Beans, (pole), 1 qt. to 150 hills; 10 to 12 quarts per acre.

Beets, 1 oz. to 50 ft. of drill, 5 lbs. to the acre in drills.

Cabbage, 1 oz. to 1,500 plants, ¼ lb. of seed in beds to transplant upon an acre.

Carrot, 1 oz. to 100 ft. of drill, 3 to 4 lbs. per acre in drills.

Cauliflower, 1 oz. for about 1,000 plants.

Celery, 1 oz. to 3,000 plants; ½ lb. to the acre.

Corn Salad or Fetticus, 1 oz to 20 square ft.

Corn, Sweet, 1 qt. to 200 hills; 8 to 10 qts. to the acre in hills.

Cress, 1 oz. to 16 square ft.

Cucumber, 1 oz. to 50 hills; 2 lbs. to the acre in hills.

Egg-Plant, 1 oz. for 1,000 plants.

Kale or Sprouts, 1 oz. to 150 ft. of drill; 3 to 4 lbs. per acre.

Kohl Rabe, 1 oz. to 3,000 plants; 3 to 4 lbs. per acre.

Leek, 1 oz. to 100 ft. of drill.

Lettuce, 1 oz. to 150 ft. of drill, or for 1,000 plants.

Martynia, 1 oz. to 100 hills.

Melons (Musk) 1 oz. to about 60 hills; 2 to 3 lbs. to the acre.

Melons (Water) 1 oz. to 30 hills; 4 to 5 lbs. per acre.

Okra or Gumbo, 1 oz. to 100 hills; 20 lbs. to the acre.

Onions, 1 oz. to 100 ft. of drill; 4 to 5 lbs. to the acre.

Parsley, 1 oz. to 150 ft. of drill.

Parsnip, 1 oz. to 200 ft. of drill; 5 to 6 lbs. per acre in drills.

Peas, 1 qt. to 100 ft. of drill; 2 bu. to an acre in drills.

Pepper, 1 oz. to 1,000 plants.

Potatoes, 8 to 12 bu. cut tubers to the acre, according to method of planting.

Pumpkins, 1 oz. to 30 to 50 hills; 3 to 4 lbs. per acre.

Radishes, 1 oz. to 100 ft. of drill; 8 to 10 lbs. per acre in drills.

Sage, 1 oz. to 100 ft. of drill; 8 to 10 lbs. per acre.

Salsify, 1 oz. to 70 ft. of drill; 8 to 10 lbs. per acre.

Spinach, 1 oz. to 100 ft. of drill; 10 lbs. to the acre in drills.

Squash (Bush) 1 oz. to 50 hills; 5 to 6 lbs. to the acre.

Squash (Marrow) 1 oz. to 20 hills; 3 to 4 lbs. to the acre.

Tomato, 1 oz. to 1,500 plants; ¼ lb. for transplanting to an acre.

Turnip, 1 oz. to 150 ft. of drill; 2 lbs. to the acre in drills.

SELECT SHORT LIST OF TREES, SHRUBS AND HERBACEOUS PLANTS.

See Bul. 96, Minnesota Agricultural Experiment Station.

The shrubs and plants in this list are selected as being the most desirable for general street, lawn and park purposes in Minnesota.

Large Deciduous Trees.

American Elm, Hackberry, American Basswood, Soft Maple, Box Elder, Green Ash, White Ash, White Willow, Russian Golden Willow, Golden Willow.

Small Deciduous Trees.

Paper Birch, Cut-leaf Weeping Birch, White Poplar, European Mountain Ash, American Mountain Ash, Kentucky Coffee Tree, Oil Berry (Russian Olive).

Evergreens.

White Pine, Red Pine, Norway Pine, Cembra Pine, Scotch Pine, Dwarf Pine, White Spruce, Norway Spruce, Englemann Spruce, Colorado Blue Spruce, Douglas Spruce, Red Cedar.

Ornamental Shrubs.

Red Twig Dogwood, Hardy Hydrangea. Tartarian Honeysuckle, Syringa, Buckthorn (common), Japanese Rose, Missouri Currant, Buffalo Berry, High Bush Cranberry, Snowball, Common Lilac, Rouen Lilac, Van Houtte Spirea, Ash Leaf Spirea, Golden Spirea.

Herbaceous Plants.

Columbine, Lily of the Valley, Larkspur, Bleeding Heart, Baby's Breath, German Iris.

Colored Daisies, Autumn Daisies, Herbaceous Peonies, Double Yarrow.

Vines.

Chinese Bell Flower, Virginia Creeper, Bitter Sweet, Virgin's Bower, Clematis Paniculata, Wild Grape (Staminate Form).

LIST OF UNUSUAL DECIDUOUS TREES HARDY IN MINNESOTA.

Trees with Weeping or Drooping Foliage.

Soft or Silver Maple, Cut Leaf Maple, Cut Leaf Weeping Birch, Young's Weeping Birch, Weeping Mountain Ash, Tea's Russian Mulberry, Wisconsin Weeping Willow.

Trees with Colored Foliage.

Acer ginnala, Sugar Maple, Reitenbach Red Maple, Schwedler Maple, Purple Leaf Birch, Yellow Birch, Russian Olive, Golden Leaf Poplar, Royal Willow.

Trees with Bright-Colored Bark in Winter.

White Birch, white bark; Cut Leaf Weeping Birch, white bark; Paper Birch, white bark; Russian Golden Willow, yellow bark; Britzensis Willow, salmon bark; Golden Willow, yellow bark; Napoleon Willow, blue bark; Basswood, blue gray bark.

Flowering Trees.

May—Juneberry; Golden Willow, staminate form; Compass Cherry; Buckeye; Crab Trees, flowering; May Day Tree. June—Mountain Ash; Native Thorns in variety; Locust; Catalpa; Basswood in variety; Bird Cherry; Russian Olive.

Trees which Produce Ornamental Fruit.

Hackberry, red fruit in September and October.

Native Hawthorn, scarlet and yellow fruit in September and October.

Mountain Ash, scarlet fruit in September and October.

Acer ginnala, red fruit.

Acer tartaricum.

LIST OF SHRUBS WITH PECULIAR FOLIAGE—HARDY IN MINNESOTA.

Purple Leaf Barberry, Variegated Leaf Dogwood, Golden Leaf Syringa, Golden Leaf Hop Tree, Variegated Leaf Elder, Golden Elden, Golden Spirea.

FLOWERING SHRUBS.

May—Juneberry, Forsythia, Dwarf Double Flowering Almond, Caragana arborescens, Common Lilac, Rouen Lilac, Van Houtte Spirea, Viburnum lantana, Mahonia repens, Missouri Currant, Tartarian Honeysuckle, Tree Poenies in variety.

June—Snowball, Weigelia, Dogwood (Cornus sanguinea), Japanese Lilac, Josikea Lilac, Rosa rugosa, Viburnum opulus, Mock Orange, Syringa in variety, Herbaceous Peonies, Clematis jackmanni, and others.

July—Spirea billardi,. Spirea Anthony Watterer, Spirea bumalda, Spirea callosa alba, Spirea sorbifolia, Clematis virginiana, Tamarix amurensis.

August and September—Pyrethrum Uliginosum, Hydrangea grandiflora, Clematis paniculata.

SHRUBS WHICH PRODUCE ORNAMENTAL FRUIT.

Barberry, scarlet and violet fruit in September.

Red Twig Dogwood, white fruit in September.

Burning Bush, red and yellow fruit in September.

Bush Honeysuckle, red and yellow fruit in July and August.

Common Buckthorn, black fruit in autumn.

Red Berried Elder,— red fruit in July.

Common Elder, purple fruit in August and September.

Wax Berry, white berries all winter.

Viburnum tomentosum, purple fruit in September.

High Bush Cranberry, red or yellow fruit in autumn.

Mahonia repens, bluish fruit in July.

SHRUBS FOR PLANTING IN SHADY SITUATIONS.

Barberry, Dogwood (Cornus paniculata), Dogwood (Cornus sanguinea), Dogwood (Cornus siberica), Dogwood (Cornus stolonifera), Mahonia repens, Ribes alpinum, Rubus sorbifolius, Wax Berry, Indian Currant, Wax Berry (Synphoricaspus), Indian Currant (Synphoricaspus).

SHRUBS FOR HEDGES.

Buckthorn, Alpine Currant, Red Cedar, Crataegus, Willows, Lilac, Dogwood, Arbor Vitae.

WINDOW PLANTS.

In Pots: Pelargoniums, Rex Begonias, Fuschia, Chinese Primrose, Chrysanthemums, Hyacinth, Freesia,Dracena, Sword Ferns, English Ivy, Palms, India Rubber Tree.

In Baskets: Wandering Jew, Oxalis Cernua, Vinca, Lobelia, Trailing Lantana, German Ivy, Kenilworth Ivy.

TREES FOR WINDBREAKS ON PRAIRIE SOILS.

White Willow is best to begin with. Green Ash is also good. White Elm is good after White Willow. Cottonwood may sometimes be used. After the windbreak is large enough to furnish protection, the White Spruce, Douglas Spruce, Norway Spruce, Austrian Pine, Norway Pine, White Pine and Red Cedar may be planted for a more permanent windbreak.

TREES FOR GROVES ON PRAIRIE SOILS.

Mixed plantings of Green Ash, Box Elder, White Elm and White Willow, in about equal quantities, with a scattering of Wild Plum, Wild Black Cherry, Russian Mulberry and Juneberry to attract the birds, will usually give good results in any section of the state. In more northern sections, Cottonwood might be substituted for Green Ash. In more southern sections, Black Walnut might be substituted for White Willow, and Hard Maple for Box Elder. Basswood can often be added except in severest upland sections. White Spruce, Norway Pine and Red Cedar can be substituted for one of the principal kinds. White Pine can also be used, except in the severest upland soils. On the more moist soils in Southern locations, Norway Spruce, Douglas Spruce, Austrian Pine, Douglas Fir, and Arbor Vitae may also be used.

REMEDIES FOR SOME COMMON INJURIOUS INSECTS.

By F. L. Washburn, State Entomologist.

The Entomological Division of the State Experiment Station contributes to our publication the following brief notes, representing the latest and best information in connection with certain common insects which annoy the farmer and fruit grower.

1. **Hessian Fly:** This is the insect that causes the wheat to "crinkle down". Fall plowing—a generous co-operation along this line among neighboring farmers—is looked upon as the best remedy. Dry, warm seasons are against its increase and it is preyed upon freely by various parasites.

2. **Chinch Bug:** Moist summers and falls encourage the growth of a fungus which sometimes takes these pests off in large numbers. This was noticeably so two years ago, since which time we have had very few chinch bugs. We do not attempt to combat these in the wheat field, but the outer rows of corn which they attack can be sprayed with kerosene, which, of course, kills the corn as well as the bugs; or, these outer rows can be cut down and straw thrown over them and burned,

burning the bugs at the same time. The more common remedy is the furrow with steep sides toward the corn. The bugs gathering in this furrow can be easily killed with kerosene and water or otherwise. It is advisable to keep the furrow dusty. The dust makes it hard for the young bugs to travel. Some farmers have protected their corn by growing a strip of millet ten or twelve feet wide on the side toward the wheat. It is a noticeable fact that where pigeon grass grows among corn the bugs prefer the former to the latter. We would suggest, therefore, leaving two or three of the outer rows uncultivated, in order that these weeds may grow at the edge of the corn field to protect the most of the crop inside.

3. **Potato Beetles.**—Potato "bugs" are easily handled with arsenate of lead at the rate of six pounds for one hundred gallons of water. This does not burn the foliage. Sprinkle or spray as frequently as necessary. Or, one pound of Paris green in one hundred gals. of water may be used, keeping the liquid stirred while in use. We advise the use of Bordeaux mixture (5-5-50) see page 59, to which Paris green has been added at the rate of one-half pound to every fifty gallons. By this mixture potato blight may be kept in check and the potato bugs killed at the same time. Use it the first time when plants have about six or eight leaves, and continue for several sprayings at intervals of ten days or two weeks. Later sprayings may be given at any time if bugs are active.

4. **Codling Moth.**—This is the moth which produces the apple worm. Use Bordeaux

mixture (4-4-50) and Paris green at the rate of one-half pound for every fifty gallons, spraying first just before the flower buds open, and again after all bloom has fallen. Apply two or three subsequent sprayings at intervals of two weeks. Apply more sprayings if the orchard has been neglected in this respect. This mixture not only controls the Codling Moth and all leaf-eating caterpillars, but also the apple scab. Paris green and water may be used alone against the worm, one pound to one hundred gallons of water. It is a very good plan to add one pound of freshly slaked lime for every pound of Paris green.

5. **Plum Curculio.**—This pest is worse on apples in Minnesota than the Codling Moth. It is recognized by the crescent cut in apples and plums. Spray with one-half pound of Paris green in every fifty gallons of (3-4-50) Bordeaux. Place carriage covers or any old sheeting under plum trees and jar in the early morning and evening when curculios first appear. Continue for a week. Trees should be given a sharp blow with some padded instrument, so that the bark will not be injured. Paris green and water, as used against Codling Moth, may also be used, or arsenate of lead six pounds to one hundred gallons of water.

6. **Tent Caterpillars.**—The caterpillars are in their tents during the night and on rainy days, and tents destroyed early in the morning or on a rainy day carry to their destruction also all the worms inside. This can be done with a gloved hand when the tent is

small and within reach, or the tents can be burned by a torch on the end of a long pole. The sprayings given fruit trees for Codling Moth and Plum Curculio will also poison these caterpillars.

8. **Cabbage Worm.**—This is the green worm which works on cabbage and cauliflower, and which is produced from the eggs of the white butterfly. Use Paris green and arsenate of lead in water during the season as frequently as occasion demands on cabbage. Cauliflower cannot be sprayed after the heads begin to form. Dry hellebore, which is harmless to man, can be used on cauliflower heads if they are eaten by insects. Some growers use Paris green on cabbages as strong as three pounds in fifty gallons of water, since they seem to be resistent to injury. A quart of soft soap, or eight quarts of very strong soapsuds should be used in every fifty gallons to insure the liquid spreading over the leaf. Any liquid which contains Paris green should be kept constantly stirred during the spraying to prevent Paris green from settling to the bottom. Cabbages can be sprayed with this mixture up to within a few weeks of gathering. Pay the children a little to catch and kill the white butterflies which lay the eggs.

9. **Cabbage Root Magot.**—Do not let old stalks remain in the field. Rotate crops where possible. Planting cauliflower and cabbage where there is some breeze, tends to keep away the fly which lays the egg producing the root maggot. The following remedy has been used with success by the Entomological

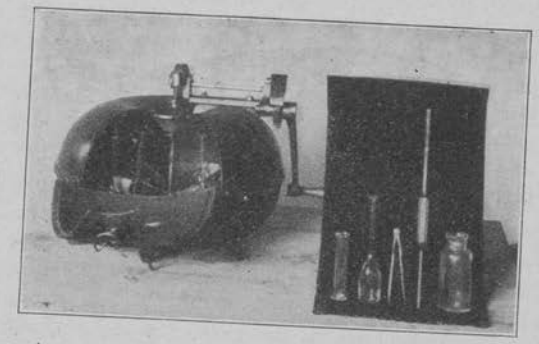
Department, and is applicable for a limited acreage. Growers must determine what is desirable in their individual cases. Steep two ounces of white hellebore in one quart of water for an hour; dilute with water to make one gallon of the decoction; apply with sprinkling can a few days after plants are set out. Five days later apply again, and give a third application five days after the second. Apply from five to seven times more at weekly intervals. It takes approximately between two and three hours to treat one thousand plants, and the material required for this number costs fifty cents at retail. About a teacupful is poured around each plant. Parasites and predaceous enemies help to keep this pest in check. No cabbage maggots have been found in Holland cabbage. Red cabbage, on the contrary, are not immune.

10. **Currant Worm.**—This greenish caterpillar frequently begins its work on the inside of the currant or gooseberry bush, and hence it is sometimes not noticed until it has nearly stripped the bush of its leaves. Keep a sharp look-out for them, and upon their first appearance spray or sprinkle bushes with arsenate of lead (one pound in ten gallons of water), or Paris green (one pound in twenty-five pounds of air-slaked lime) used while fruit is small. Afterwards use white hellebore as a dry dust, when leaves are wet with dew, or one ounce in one gallon of water sprayed, or showered on with small broom.

11. **Clothes Moth.**—We have found relief from these pests, which eat furs and woolens, by having a perfectly tight box, made of a

size sufficient to enclose all the goods which need protection, and every two weeks after putting them away, putting four tablespoonfuls of bisulphide of carbon in a shallow dish on top of the clothes, shutting the box up tightly afterward. The above proportions of bisulphide of carbon apply to an inclosed space of about 16 cubic feet.

TESTING COWS.



A testing outfit. From left to right, an eight bottle tester, graduate for acid, milk test bottle, compasses, pipette, sample bottle.

By weighing the milk from each cow every milking or for three or more days each month and testing it to determine the percent of fat, the actual performance of each cow may be known and the unprofitable ones discarded from the herd.

A spring balance hung on an arm projecting from the wall near the milk can makes the weighing of the milk very simple.

The following form is suggested for keeping yearly records of individual cows:

Name or Number of Animal .....

		Average Daily Yield	% Fat	Total Yield	Total Butter Fat
Year.....	January....	.....	....	.....	.....
	February...	.....	....	.....	.....
Age.....	March.....	.....	....	.....	.....
	April.....	.....	....	.....	.....
Breed.....	May.....	.....	....	.....	.....
	June.....	.....	....	.....	.....
Time of Calving	July.....	.....	....	.....	.....
	August.....	.....	....	.....	.....
	September..	.....	....	.....	.....
Value.....	October	.....	....	.....	.....
	November..	.....	....	.....	.....
	December ..	.....	....	.....	.....

POINTS ON CARE OF GASOLINE ENGINES.

Wm. Boss.

Gasoline engines are coming into very common use on many farms, and as a general thing are paying propositions. A farmer who gets a gasoline engine will find it a great help in saving labor. Not only will it relieve him of much of the drudgery, but it seems to add life and interest to the work in hand. A gasoline engine is a comparatively simple machine, but is likely to give trouble sooner or later the same as any other kind of machinery. To be a successful operator, one should study the engine and be able to locate and

repair any trouble that is liable to occur. The following points cover some of the most common troubles:

Keep your engine clean and free from surplus oil.

Keep all valves and working parts well oiled, so they work freely.

Be sure to use gas engine cylinder oil for lubricating the cylinder.

Do not use steam engine cylinder oil.

Do not use dirty gasoline. If dirty, strain it before putting into the tank.

Do not feed too much gasoline. The engine will lose power, and exhaust will show black smoke.

Do not feed too much lubricating oil. It fouls the igniter, gums the cylinder.

White smoke coming from the exhaust is indication of too much cylinder oil.

Black smoke coming from exhaust is indication of too much gasoline, or too small amount of air.

Explosions in the exhaust pipe are frequently caused by insufficient gasoline.

Points to Look For In Case Engine Refuses to Start.

Gasoline supply.
Switch connection.
Electric connections on battery and switch.
Gasoline supply not turned on.
Air supply open too wide. Not drawing enough gasoline.
Electric batteries weak.
Igniter coated with oil or dirt.
Lack of compression.

Lack of Compression.

Lack of compression is a common cause of engine not developing full power. It may be observed by the engine turning very easily. It is usually caused by leakage, either around the piston, around the valves, through igniter or cylinder head. If an engine does not have sufficient compression the engine will waste gasoline, as it is forced out with the escaping air. If valves leak, they should be ground in. If the engine is old and leaks around the piston, the piston should have new rings, or the cylinder should be rebored and fitted with new piston and rings.

Compression is frequently lost through loose connections at igniter, remedied by grinding in igniter stem, putting in new insulation.

Water in Gasoline.

Trouble is frequently caused from water in gasoline. This is often due to moisture condensing inside the gasoline tank. This water settles to the bottom of the tank, and as the gasoline supply pipe is connected near the bottom, water is drawn up in place of gasoline. The supply pipe should be fitted with a drain cock, which should be opened before engine is started to note if water is present.

POULTRY LICE AND MITES.

C. H. Welch.

The lice and mites of the poultry house are entirely different, although often spoken of as though they were the same creatures. Both of them breed in the filth and damp corners of the houses, so that cleanliness is

the greatest help in getting rid of them. The lice are found on the walls, roosts and nests of the house, but spend a great deal of their time on the fowls. Cleanliness in the house and thorough whitewashing twice a year, in addition to the furnishing of dust baths for the fowls and use of insect powder on setting hens, will, usually, keep the house pretty free from lice. The little chicks can be treated with a small amount of lard rubbed on head and throat and under the wings.

The mites are harder to kill and need more vigorous treatment. They visit the fowls only at mealtimes, making their raids at night and then returning to their hiding places. Kerosene emulsion gives the best results in fighting them. It is made as follows: Shave a half pound laundry soap in a gallon of soft water and boil. Remove from the fire and while hot mix in two gallons of kerosene, stirring with a paddle or churning with a force pump. This will make a thick emulsion. Use one part of the stock emulsion to ten parts soft water and apply to every portion of the house with a spray pump or whitewash brush. Give a second dose three to four days later, and still another three or four days after the second. The emulsion will kill every mite and louse it touches and the second and third doses will get those that hatch after the previous applications.

Dirty dropping boards are the greatest breeding places for vermin. Clean off the boards frequently, especially during warm weather. After each cleaning apply air slaked lime, fine dirt or ashes to the boards. This

not only helps to keep down the vermin, but will assist materially in removing the droppings the next time.

SHEEP AND HOG NOTES.

D. A. Gaumnitz.

Winter Sheep Feeds.

According to the make-up of a sheep's stomach, it is an animal designed for the consumption of rough feeds such as various sorts of hay and fodder. To keep up the fertility of our soil and to keep our land clean it is necessary to grow hay crops containing some clover and crops that may be cultivated, such as fodder corn or shock corn. Such feeds have no particular market value and should be valued according to the cost of producing them. Grains have a market value and may be disposed of. A dollar invested in producing rough feeds will produce more feed than a dollar invested in grain at market price. Rough feeds, therefore, should be grown and used as feed for sheep.

Breeding ewes, if in fair condition when put into winter quarters in fall, need not gain more than from 15 to 25 pounds per head. This gain allows for the development of the unborn lamb and the wool crop. Rations to make the ewe gain slightly and yet keep her thrifty, must be carefully made. Some rough feeds contain considerable fibre. With them it is necessary to feed succulent or oily feeds. For example, with oat straw, timothy or oat hay, roots or oil cake should be fed. With clover, which is naturally laxative in effect, such supplement is not needed. Exercise for

the ewes, regularity in feeding, watering and salting, are factors that count in sheep feeding.

Rations for Ewes In Lamb.—A few rations that have been fed to ewes in lamb with good results follow. They are the daily feed per 100 pounds live weight.

1. 2nd crop clover hay alone, 3.5 to 3.7 lbs.
2. Corn fodder in which are nubbins, 3.7 lbs.
3. 2nd crop clover hay, 1.5 lbs., corn fodder, 1 lb., oats and corn, .3 lb.
4. 2nd crop clover hay, 1.8 lbs., roots, 1.5 lbs., shelled corn, .3 lb.
5. 2nd crop clover, 2.5 lbs., barley, .55 lb.
6. Corn fodder, 2.6 lbs., roots, 1.5 lbs., oats and corn, .3 lb.
7. Oat hay, 1.5 lbs., and (barley 98, flax seed 2) .7 lb.
8. Oat straw, 2 lbs; roots, 1.6 lbs., (oats and bran) .6 lb.

AGE OF SHEEP.

Ages Sheep Are Good.—Fine wool sheep live longer than medium or coarse wool sheep. The former have been used successfully as breeders from 1 to 8 years and the latter from 1 to 6 and more rarely 7 years. This indicates the extreme period of usefulness in the flock. The prime of life probably extends from 1 to 5 or 6 years.

The Lamb.—Has a short and small head as opposed to the head of the mature sheep. Its teeth are smaller in every way. They are usually smooth and white as opposed to a more corrugated darkened surface in the old sheep. The age of sheep is told by the four pairs of incisors which are found only on the lower front jaw. These are all present by the time the lamb is six weeks old.

The Yearling.—The central pair of small incisor teeth are replaced with a large pair when the lamb is ten to fourteen months old.

They are almost twice as wide and much longer than those at either side.

The Two Year Old.—Gets a second pair of large teeth. Two pairs of large teeth mean a two year old.

The Three Year Old.—Gets a third pair of large teeth when about three years old. It would then have three pairs of large teeth and one pair of small or lamb teeth.

The Four Year Old.—Has a full mouth of four pairs of large teeth. The outer ones are never as large as those in the center.

Five Years Old and Over.—After the sheep is four years old it is difficult to tell the exact age. With age, the teeth usually grow longer and narrower. They begin at six years to resemble shoe pegs. Sheep that are pasturing on short pasturage and get sand with their grass wear their teeth short even in old age. This is unusual in Minnesota. When sheep get long, peg like or broken teeth it is time to dispose of them.

DIPPING SHEEP.

Sheep are dipped to rid them of external parasites and the scab mite.

Kinds of Dips.—Lime and sulphur dips are injurious to the wool, because of the caustic effect they have. Tobacco and arsenic dips are poisonous, both to sheep and man and must be used with great care. "Coal tar" dips are considered among the best dips by experienced sheep men, because they are effective, non-poisonous and do not ordinarily injure the wool.

Testing and Mixing.—All dips should be tested. Mix one teaspoonful of dip to 50 or 75 of water, as per directions. After loosely wrapping a few ticks or bed bugs in a very thin gauze dip them into the mixture for thirty seconds. Then remove and place under a tumbler. If all are dead in six hours the mixture is strong enough. If not, make solution stronger until thirty seconds in the

dip is effective. In dipping sheep, keep them in the dip for one minute.

To mix, place the dip in the tank first, then add water, otherwise it does not always mix uniformly.

When to Dip.—Dip just after shearing, then little dip is lost, results are better if dipping is deferred until wool is one-fourth to one-half inch long, as more dip will be held in fleece. If ticks are present at shearing time, the entire flock should be dipped at once before ticks get to the lambs. Repeat the dipping in ten days to kill any escaped or newly hatched insects.

Thorough Work.—After dipping, remove sheep from the sheds and yards in which they were kept. Then any loose ticks or lice cannot get back on the sheep.

SHEEP PASTURES.

There is no feed so appropriate for sheep as pasture. Nothing furnishes a cheaper feed, and plenty of it should be found wherever sheep are grown. The fields, as well as the regular sheep pasture, should contribute pasturage. The time for using a fence and especially provided pasture is from May to Aug. 15 or Sep. 1st. The stubble fields, corn fields and aftermaths should furnish the pasture for the balance of the season.

An acre of grass pasture, such as clover, clover and bromus, or clover and timothy, will furnish about 1,500 days pasture for a 100 pound sheep. Annual pastures, such as barley and oats, rye and rape, corn and rape, will not, on the average, furnish as much.

The grass pastures cost less for seed and practically nothing for sowing and preparation of the land compared with the annual pastures. Grass furnishes the most and cheapest pasturage, but it cannot with safety be used for more than a season unless the flock is absolutely free from stomach worms (and stomach worms must be avoided). The second year it may be used for calves, pigs or cattle. The annual pasture, though it costs more, is always in order in case grass fails or in dry season or when worms have been troublesome.

For a flock in which the ewes average 100 pounds and the lamb crop is about 100 percent of April lambing, one acre of good grass pasture will feed about 9 or 10 ewes and lambs until Sep. 1st. If the ewes are of 125 pounds average weight, not more than 6 or 7 should be allowed per acre.

Rape sown two to three pounds per acre in grain at seeding or corn at last cultivation, will furnish excellent feed for the sheep from Sep. 1st until the flock goes to winter quarters. This is very cheap pasture. Unpastured rape does the land no harm, but rather increases yields of following crop.

Lambs may be turned into the corn field by Aug. 10 to 20. They will not eat the ears, but will eat the lower leaves and any weeds that may be present. This is a cheap pasture, and unless thus utilized is actually wasted and may even do harm.

Raise plenty pasture, use the waste and catch crops and the cost of pasture for sheep becomes ridiculously low.

SCOURS IN PIGS.

Scours in little pigs may be caused several different ways, but the chief cause is over feeding, coupled with irregular feeding and sudden changes in feed.

The stomach and intestines in a pig are comparatively small. The pig is greedy and eats all it will hold. The digestive juices dissolve or decompose the food and turn it into a milky, soupy condition. Unless from this mass the digested material is assimilated or absorbed by the cells lining the digestive tract. the material must be pushed on through. When more food is fed than can be absorbed,

it of course has to be passed along with the indigestible matter in the faeces. When this happens the faeces are soft or watery and hog men say the pigs are scouring. The fact of the matter is the pigs are being overfed and this is having a decidedly bad effect upon them in that it is encouraging the wasting of feed. Scouring pigs are not usually economical pork makers.

Lighter feeding then is as a rule the true remedy for scours and not drugs. The feed should, of course, be gradually increased from day to day and sudden changes in the ration should be avoided. This will help to avoid scours and to remedy the trouble when it occurs.

BATHS FOR PIGS.

A pig's skin needs to be kept in good condition if the pig is to do well. Mange and lice are two pests that make trouble. A clean hog wallow helps the hog out of trouble. Too often the hog wallow is a filthy one and the pig is actually harmed.

Dipping and soaking pigs helps to keep them in good condition, but this requires much labor. A more recent way to avoid filthy wallows and to save labor is to build a hog bath. This is done by scooping out a hole in the ground a foot or 18 inches deep. This is then plastered with layers of cement until 3 or 3½ inches thick. An upright edge is built around the top and earth banked up to it. The bath is made large enough inside so that several hogs can take a stretch in it at a time. A regular sheep dip is used to mix with water for the bathing fluid. After the hogs are absolutely clean pure water only is used, except as occasion demands. In this way the hogs are kept clean and contented and with little labor.

CEMENT CONSTRUCTION.

A. M. Bull.

Cement has become such an important and cheap material, in connection with all building work, that it is well to understand its use.

It costs less today to put in a cement floor than it does to put in a wooden floor for barns, cellar, hog pens, walks, etc. The wood floor is of much shorter life than the cement floor. For walls, foundations, piers, etc., it is considered better and cheaper than brick or stone. And it is fast nearing the point where cement structures will be nearly as cheap as wooden structures. If the life of the two materials are considered the cement is cheaper. But the first cost of installing is more for cement than for wood, but very little.

Portland cement should be used for all such work.

Remember the natural cement, such as Austin, Mankato, Milwaukee, etc., will not do for this kind of work. They are used for mortars for brick and stone work only.

Portland cement has a rather greenish color. The natural cements have a brown color.

Portland cement is sold by the barrel, about 400 pounds per barrel gross.

The cloth sack is the more general way of shipping, there being 4 cloth sacks to the barrel.

One sack contains nearly one cubic foot or more closely .95 of a cubic foot, and should weigh 98 pounds.

Four general mixtures are used, depending upon the nature of the work or upon the strain to which it will be subjected.

	Cement	Sand	Gravel
(a) Rich mixture.....	1	2	4
(b) Medium mixture..	1	2½	5
(c) Ordinary mixture.	1	3	6
(d) Lean mixture.....	1	4	8
(e) Poor mixture.....	1	4½	9

(a) is used for reinforced concrete work,

concrete floor construction in office buildings, footings for heavy engines.

(b) is used for a little less important work, as large building foundations, cement posts, steps, troughs, etc.

(c) is used for less important work, as light walls, retaining walls, etc.

(d) is used for grouting floors in barns and residences.

(e). Similar to (d). Cement, sand and gravel must be of the best.

Amount of sand and gravel for one cubic yard of concrete:

	Barrels Cement	Cubic Yds. Sand	Cubic Yds. Gravel
(a)	1.57	.44	.88
(b)	1.29	.45	.91
(c)	1.10	.46	.93
(d)	.85	.48	.96
(e)	.79	.48	.96

Note.—Cement is in terms of barrels, while sand and gravel are in terms of cubic yards.

Finish Coat.

The above formulae are used for foundation work, piers, etc. If a finish coat is desired, as for floors, walks, etc., screened sand and cement are used alone, the mixture depending upon the use to which it is to be put.

Formula for finish surface:

Barrels Cement	Barrels Sand					
1	1	will cover	.68	sq. ft.	1	in. thick
1	1	" "	.95	"	¾	"
1	1	" "	1.36	"	½	"
1	2	" "	1.04	"	1	"
1	2	" "	1.40	"	¾	"
1	2	" "	2.04	"	½	"
1	3	" "	1.40	"	1	"
1	3	" "	1.90	"	¾	"
1	3	" "	2.80	"	½	"

For surfacing cow barn floors and for walks and drives, use 1 and 2.

For heavy, sharp shod horses, use 1 and 1.

For chicken coop, hog barn and basement floors a mixture of 1 to 3 can be used.

In all mixtures be sure sand is free from dust and dirt, and that the cement and sand are thoroughly mixed before being wet.

Finish barn floors with wooden float (wooden trowel), so they will not be too smooth.

For high polish, apply steel trowel generously.

If drains or gutters are wanted form them in the grouting coat.

HOG CHOLERA AND CONTAGIOUS ABORTION.

By Dr. M. H. Reynolds.

Hog Cholera.

Symptoms.—There is usually a mild suppressed cough; reddened or purplish skin over the belly and flanks. Constipation at the very onset which is usually overlooked and later diarrhea. The discharge in the diarrheal stage resembles a mixture of thin, black mud with bran. In a few cases the disease develops very suddenly and the animal dies almost before the owner knew he was sick. There is usually loss of appetite, and frequently symptoms of nervous disturbance, sometimes paralysis of the limbs. In some outbreaks sores develop on the neck or back. In other cases we have the long drawn out chronic type in which the animal may be sick for several weeks and eventually recover.

On examination after death, the symptoms to be noted for our common hog cholera-swine plague cases, are coloring of the skin on the belly; minute red dots in the fat under the skin; and inflammation of the lungs. Frequently the diseased portions of the lungs are solidified and nearly liver color. The margin between the diseased and healthy portions of the tissue is very sharply defined. Peculiar ulcers are found in the large intestine, especially at the point where the large and small intestines connect. The kidneys show a peculiar turkey egg coloring just under the thin covering.

In some cases hog cholera is accompanied

by a general inflammation of the lungs and the lung covering, with pus in the lung substance and in the cavity around the lungs.

Caution.—Hog cholera is a contagious disease and may be carried by sick hogs, on shoes and clothes, in hog racks, stock cars, and by dogs, etc. Hogs from public stock yards should be avoided or at least kept away from other hogs. Don't visit your neighbor's sick hogs.

Money spent for medicine in treatment of hog cholera is probably wasted, except for disinfecting purposes.

It should be understood that hogs take on this disease usually by way of the digestive tract. If fed clean feed, in clean trough or from uninfected ground surface they are not likely to get the disease.

CONTAGIOUS ABORTION.

Contagious abortion is an infectious disease. It is spread in many ways, commonly by either male or female cattle that have been purchased and added to a herd; for instance, Farmer A has the disease in his herd, and some of Farmer B's cows are bred to A's bull and thereby become infected. One infected bull in the neighborhood or one infected cow may indirectly involve any number of herds.

Infectious Materials.—The infectious things about a case of abortion are the young calf that is dropped usually dead, the cow manure, the after-birth, the subsequent discharges, manure during the first week or so from the calf that is born of an infected cow, and old enough to live.

It should be understood that when a cow becomes infected with this disease, she usually aborts once or twice and then becomes immune, although remaining infectious for an indefinite time. After the first or second calf she may breed and raise a healthy calf, but is infectious to the bull that serves her and

may perhaps be infectious indirectly to other cows in the same stable.

Diagnosis.—Cows may abort from other causes; but one may usually be guided by the history of the case, the breeding relations of his herd to other cattle, and to new animals introduced within a year or two. The dirty, bad smelling discharge that accompanies the abortion is rather characteristic. The umbilical cord in case the calf is carried for a number of months, appears swollen and dropsical.

Treatment.—Medical treatment after a cow shows symptoms of abortion is of very doubtful value.

Prevention.—Simply be on guard against introducing the disease into the herd. It is really a very serious disease and many do not realize the loss and annoyance that may be caused by it.

Instructions for preventive treatment are very lengthy and must be gone into in detail to be serviceable at all. It consists in general of internal and external disinfection of bull and cows, disinfection of stalls, etc., and destruction or burial of infectious material like the after-birth and foetus. For further information address the writer, St. Anthony Park, Minn.

AZOTURIA, COLIC, MILK FEVER AND BLOAT.

By Dr. C. C. Lipp.

Azoturia.

This disease is quite common among farm horses during the spring and summer months. It may occur at any time of the year in horses that are worked every day with only an occasional day or two of rest.

Predisposing Causes.—The conditions most likely to cause this disease are: good, vigorous health and a high condition as when the animal receives a large amount of nitrogenous food and stores it in his tissues to be drawn upon when needed.

Precipitating Cause.—A horse that works requires a certain amount of nitrogenous food to furnish the energy for this work. After his tissues become accustomed to utilizing this amount of food daily, if the horse stands idle a day or two and receives the same quantity of feed necessary to support him when at work, his tissues at once become filled with a surplus store of food ready to be utilized as soon as he is again put to work. As soon as work begins this store of food is supplied faster than it can be completely utilized, and there results a surplus of partly oxidized food material which cannot be eliminated as fast as it is produced. It is the circulation of this partly oxidized food that gives rise to azoturia.

Symptoms.—The horse is brought from the stable after an idleness of a day or two, in the best of spirits. The owner thinks that his horse never felt better, or seemed more willing to work. After a little time, maybe half an hour, maybe half a day, or even a day, the animal sweats more than usual, and shows less desire to go ahead. Then he becomes weak in his hind quarters, staggers, falls, and rises only to fall again. This finally results in his inability to regain his feet. Sometimes the owner does not see all these symptoms. After a day or two of rest the horse is worked a day and the next morning when the owner finds his horse unable to get up he may suspect azoturia.

Treatment.—It is best to call a veterinarian at once, because so many conditions may need attention that it is not wise for the owner to attempt treatment. He should, however, make his horse comfortable in a well bedded stall. Keep him quiet as possible, giving him plenty of water to drink, and a drench of one pint of raw linseed oil. In giving medicine to a horse lying down, great care must be exercised to prevent getting medicine in the horse's windpipe.

Prevention.—When horses have become accustomed to work and heavy grain feeding, cut the grain feed in half every day of idleness. If possible, give exercise in an open lot every idle day after spring work has begun.

Milk Fever.

This is a disease of milk cows, especially of the dairy breeds. It usually affects the best animals in the herd, and appears oftenest after the cow has had her third or fourth calf. It has been known to appear before calving and also thirty-six hours after. If there are no symptoms during the first thirty-six hours after calving, in all probability the cow will be free from an attack.

Cause.—At the time of calving or within thirty-six hours thereafter, milk secretion is re-established, and an immense quantity of blood is required in the udder. This leaves some other part of the body without its proper supply. In this disease it is known that the brain and spinal cord suffer most from this lack of blood.

Symptoms.—The symptoms of milk fever are usually easily recognized. The cow becomes uneasy, moves from side to side in the stall, staggers and falls. After several unsuccessful attempts to regain her feet she rapidly becomes worse and remains down. The eyes become glassy, and the sense of sight and feeling are to a great extent lost. The cow remains in the usual lying position with her head thrown around to her side. She usually remains quiet, but may throw her head around quite violently. Both breathing and pulse are depressed.

Treatment.—This should begin as soon as the true nature of the disease is determined. Except in very bad cases, simple distension of the udder with air is all that is necessary. To do this the udder is milked clean. Then a previously boiled milk tube is connected with a piece of rubber tubing to a rubber bulb outfit, so constructed that all air forced into the udder first passes through carbolized cotton. If a rubber bulb outfit is not at hand, a small bicycle pump will answer quite well. After each quarter is quite well distended a tape or

narrow bandage, not a cord, should be tied around the extremity of the teat, to retain the air. The tapes should not remain in place longer than six hours, when they must be removed and the teats rubbed to restore healthy circulation. The udder may be distended with air a second and third time if necessary.

Colic.

Every horse owner is more or less familiar with colic, its symptoms, and a treatment that he considers a sure cure. Anything that may cause abdominal pain may be said to be the cause of colic. Since there are so many conditions which may cause abdominal pain, it will be impossible to consider more than one, namely, paralysis of a part of the intestine.

Causes.—Giving a heated horse a drink of cold water, or allowing him to stand in a cold wind or draft, are common causes. Sometimes very bulky, innutritious or partly ripe food may cause it. Sometimes its cause is difficult to explain.

Symptoms.—The symptoms most in evidence are sweaty patches unevenly distributed over the body, uneasiness, pawing, rolling. The horse frequently looks at his flank, lies down, gets up, and attempts to urinate. At times he may stand perfectly still, and very suddenly show signs of severest pain, sometimes throwing himself about most violently.

Treatment.—If possible, place the horse in a roomy well bedded box stall, first removing everything he may strike against, as water pails, forks, harness, etc. Then he may be given a drench of one-half ounce chloroform in one pint raw linseed oil. This may be repeated every half hour if necessary, until four doses have been given. If the animal is no better after four doses have been given or is a very valuable one, it is best to send for skilled veterinary assistance early in the attack.

Prevention.—Colic may often be prevented by removing the cause. Don't water your horse when he is very warm. Don't allow

him to stand in a draft when he is warm without proper protection. Don't feed mouldy or innutritious foods, or those not fully matured.

Bloat.

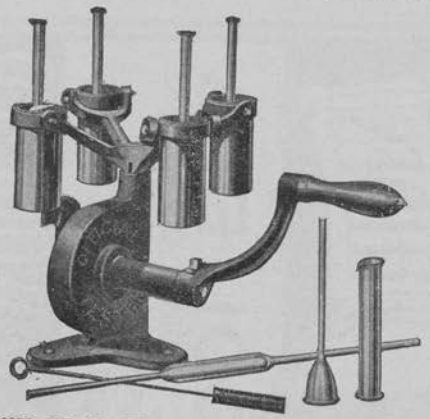
This is a disease occurring oftenest in cattle. It consists of a gaseous distension of the paunch, which causes pain, difficult breathing, and sometimes death in a very short time.

Causes.—Bloating may be caused by eating too greedily or eating indigestible food. Thus when cattle eat wet clover or too much green corn it is usually eaten too hastily and disorders digestion so the mass of food remains in the stomach and produces gases that are retained. Frosted turnips and cabbages frequently give rise to this disorder. It may result from choke, because the gases which normally pass off through the esophagus are prevented by the foreign body.

Symptoms.—The swelling in the left flank is the first characteristic symptom. In well marked cases it rises above the surrounding parts, and when struck with the fingers gives a drum-like sound. If the paunch be very much distended, there is difficult breathing; the mouth is held open while the animal gasps for breath; and the entire facial expression is one of distress.

Treatment.—This consists in such medicines as will prevent the further formation of gas. For this purpose two ounces aromatic spirits ammonia should be given as a drench every half hour until bloating subsides. Or from one to two ounces turpentine may be given, and repeated in an hour if necessary. Either medicine should be mixed with one pint sweet milk before drenching. In extreme cases there is not sufficient time for medicines to act. Then it is necessary to puncture the paunch with a trocar, well forward in the left flank. The trocar must be left in place until gas ceases to escape. If no trocar is at hand, and there is need for quick action, a puncture may be made with a jack knife and a goose quill placed in it to keep it open.

ROBBER COWS



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" 3—2	"	"	"	"	and cream	4.50
" 4—4	"	"	"	"	" "	5.50

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MINNEAPOLIS, MINN. Dept A.

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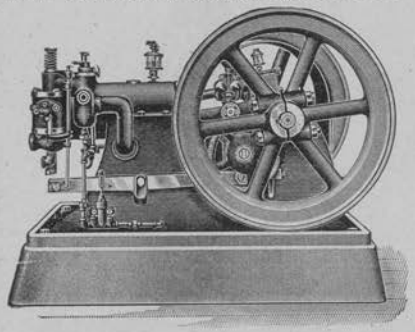

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Department A.

MINNESOTA STATE LAND SALES
JUNE and JULY, 1908

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	Acres Offered
Monday, June 22, 10 A. M. Hallock, Kittson Co.	30,000
Tuesday, June 23, 10 A. M. Warren, Marshall Co.	44,000
Thursday, June 25, 10 A. M. Roseau, Roseau Co.	58,000
Saturday, June 27, 1 P. M., Bagley, Clearwater Co.	12,000
Monday, June 29, 2 P. M., Little Falls, Morrison Co.	10,000
Tuesday, June 30, 9 A. M., Brainerd, Crow Wing Co.	17,000
Tuesday, June 30, 5 P. M., Walker, Cass Co.	25,000
Wednesday, July 1, 10 A. M., Park Rapids, Hubbard Co.	15,000
Thursday, July 2, 11 A. M., Wadena, Wadena Co.	15,000
Thursday, July 2, 4 P. M., Detroit, Becker Co.	20,000
Monday, July 6, 11 A. M., Aitkin, Aitkin Co.	40,000
Tuesday, July 7, 10 A. M., Duluth, St. Louis Co.	20,000
Wednesday, July 8, 9 A. M., Grand Rapids, Itasca Co.	35,000
Thursday, July 9, 10 am., Bemidji, Beltrami Co.	15,000
Friday, July 10, 10 A. M., International Falls, Koochiching Co.	10,000
Monday, July 20, 1:30 P. M., Carlton, Carlton Co.	15,000
Tuesday, July 21, 1:30 P. M., Pine City, Pine Co.	3,600
Wednesday, July 22, 11 A. M., Princeton, Mille Lacs Co.	4,000
Friday, July 24, 9 A. M., Fergus Falls, Ottertail Co.	3,000

TERMS OF SALE.—These lands will be sold at Public Auction to the highest bidder. Fifteen per cent of the purchase price must be paid at the time of sale. The balance may run for 40 years at 4 per cent annual interest if desired. The title to all state land is perfect. Valuable illustrated book on Minnesota lands free; also list of lands offered.

SAMUEL G. IVERSON, State Auditor, ST. PAUL, MINNESOTA

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