HAWAII'S CROP PARADE

A Review of Useful Products Derived from the Soil in the Hawaiian Islands, Past and Present

By

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# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Prospecting (A Preface)</td>
<td>9 – 12</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>13</td>
</tr>
<tr>
<td>Historical Outline of Agriculture in the Hawaiian Islands</td>
<td>15 – 32</td>
</tr>
<tr>
<td>Hawaii’s Crop Parade</td>
<td>33–289</td>
</tr>
<tr>
<td>Index of Scientific Names</td>
<td>291</td>
</tr>
<tr>
<td>Index, General</td>
<td>293</td>
</tr>
</tbody>
</table>
Agricultural Prospecting

Back of the wealth-producing mine is the prospector, that lone figure trudging mountain and desert, sampling here, there and everywhere, always hopeful that the next thrust of his pick will open a bonanza.

Back of our great agricultural industries, also, there is a long story of prospecting: the lone farmer trying many new crops, the pioneer company exploring the possibilities in new products and untried land areas, the investigator and experimenter seeking the best that science can make possible for industrial development.

The finding of a good crop plant or animal and the subsequent establishment of a profitable industry thereupon does not bring an end to this quest, for always there is the lure of the frontier, the creative margin, where the prospector continues his search for something new and better.

The value of this prospecting service does not lie in the possibility that an established industry may be displaced by one that is new and more profitable; the greatest value is the strengthening and stabilizing of the economic structure of a state or a nation by the increased diversification in agricultural industries which results from the prospector's discoveries.

Diversification of agriculture is a pressing problem in Hawaii, as in many other places. It is not a new problem, however, for much effort has been expended during the past 150 years in experiments upon many different agricultural crops and industries here. A brief outline sketch of these attempts at diversification is offered in the following pages, but it tells only a little of the human side of the story—the hardships, the tragedies, the heartaches at failure, and the glow of satisfaction when efforts were successful; there have been losses of money, sometimes staggeringly large, sometimes small but no less serious to the loser, and there have been handsome profits: one hears of the profits but seldom of the losses, and it is easy to slip into the error of overlooking the expense side of the ledger.
There are several good reasons why agricultural industry in Hawaii should be of a diversified nature: (1) economic stability is strengthened when there are several major industries, instead of one, for it seldom happens that disaster overtakes all simultaneously and in the same degree; (2) our geographical isolation is less acutely felt in time of strikes or wars which cut off shipping, if we are producing things which can be used to sustain life during the emergency; (3) the islands are so greatly diversified in topography, climate and soil types that diversification of agriculture is perfectly logical and natural, indeed almost inevitable.

The Hawaiian archipelago is situated just within the tropics, the northern island Kauai, being only a relatively few miles south of the Tropic of Cancer. The geographical center of the island group is on about the same latitude as Cuba and Formosa.

Throughout most of the year the Hawaiian Islands are cooled by the trade winds blowing from the northeast, and consequently the average climate is a little less tropical than it otherwise would be. Geographers\(^1\) place the archipelago in the isotherm of 68 degrees. This, however, is only the mean; from one locality to another the range of variation from the mean may be very extensive, for within a few miles one can pass from a humid, tropical climate at sea level to almost arctic cold at the top of high mountains.\(^2\)

Topography varies widely: there are the broad, smooth, flood plains and large, sloping shoulders between gulches and canyons, where power machinery may be used to good advantage; there are very fertile valley bottoms, too small for large-scale operations, but excellent for small farming; there are steep slopes which must be terraced; there are vast areas where lava flows of the past few centuries are still in the process of disintegrating into agricultural soil, and as yet capable of being farmed only in scattered spots and only by hand implements; there are extensive areas which because of the steepness of slope and rockiness of

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the ground are suited only to be used as pastures for cattle and sheep.

In soils, too, there is very great diversity. Some are of coral origin and strongly calcareous, while others have been formed by the disintegration of basaltic lava. Even among these latter there is great variation, for successive lava flows brought forth from the interior of the earth materials of great diversity in chemical and physical constitution.

Except in a few unusual and generally unimportant situations, soil alkalis have never been a problem in Hawaiian agriculture. In general the island soils have been formed under conditions of such intense rainfall that alkaline materials are leached from the weathering rock as quickly as they appear in a soluble form. Such a process coupled with the adequate drainage provided by the porous and fissured rock of the mountain masses permits the removal of toxic materials before deleterious concentrations can be reached. Of course, beneficial materials such as potash, calcium and perhaps phosphorus may be lost by the same means. As a result, Hawaiian soils are not particularly nor continuously productive unless mineral fertilizers are used. But this low natural fertility is partially offset by freedom from troubles due to accumulations of toxic materials.

General as this conception may be to the great bulk of Hawaiian soils, particularly those of the uplands, certain exceptions should be noted. In some limited areas agricultural land has been reclaimed from salt marshes near the sea by conventional drainage procedures. Here a saline ground water table may be encountered within a few feet of the surface. In such cases difficulties with toxic materials in the soil may be expected due to the continued upward movement of water charged with saline materials under the influence of capillarity. However, the marked deterioration of such land can be prevented by sound drainage principles. Such soils, when adequately protected, are often outstandingly productive.

For a comprehensive treatise on the soils of the Ha-

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3This paragraph and the next one were prepared by Prof. H. A. Wadsworth, of the University of Hawaii.
waiian Islands, see "Handbook of Hawaiian Soils" published by the H.S.P.A. Experiment Station in 1935.

The reader interested in a detailed discussion of geographical features of these Islands is referred to Coulter's "Land Utilization in Hawaii," cited in a preceding footnote. Climatic variations are discussed by L. H. Daingerfield, of the U. S. Weather Bureau, in Thrum's Annual 1920, pages 43 to 48.
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