

**ELEMENTARY LESSONS
IN THE PRINCIPLES OF
AGRICULTURE**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649435128

Elementary Lessons in the Principles of Agriculture by W. Jerome Harrison

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Cover @ 2017

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W. JEROME HARRISON

**ELEMENTARY LESSONS
IN THE PRINCIPLES OF
AGRICULTURE**

The Royal School Series.

ELEMENTARY LESSONS
IN THE
PRINCIPLES OF AGRICULTURE.

*SPECIALLY ADAPTED TO THE REQUIREMENTS
OF THE NEW CODE OF 1882.*

BY

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SECOND STAGE.

London:

T. NELSON AND SONS, PATERNOSTER ROW.

EDINBURGH; AND NEW YORK.

1884.

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PRINCIPLES OF AGRICULTURE.

I.—PLANT-FOOD IN THE SEED.

1. Plants require Food—2. Nature of Food in general—3. Food in the Seed—
4. An Egg and a Seed.

1. Plants require Food.—Every one knows that animals require food, for we see that they soon languish and die if they cannot obtain a sufficient supply of it. Plants require food just as much as animals; and, like animals, they starve and perish if they cannot get a proper amount of the right kind of food. But it is not so easy to see plants take their food as it is to watch animals eating; and if we want to find out what *plant-food* is, we shall have to look very carefully. Perhaps we shall even require to ask the plants some questions—that is, try some experiments—in order to find out what kind of food they prefer, and how they take it in.

2. Nature of "Food" in general.—Of the three kingdoms of Nature—the animal, the vegetable, and the mineral—only the two former can be said to require food, or to eat. A mineral, or a stone, will be none the worse if it be not supplied with food of any

kind; but if a plant or an animal is to grow, or even to continue to live, it must be supplied with food. Animals, however, require a different kind of food from that needed by plants. The food of an animal may consist of the flesh of other animals, or of the matter of plants. If we supply an animal with *mineral* matter only, we shall find that it cannot use this as food: animals cannot feed entirely upon such substances as water, earth, and air.

But the members of the vegetable kingdom—plants—can feed on mineral matter. In the first volume of this book we have seen how the portion of the soil which dissolves in water, or in water containing a little of certain weak acids, is used by plants as food. Entering by the root, this soluble or active part of the soil acts as food to the plant, sustaining and nourishing it, building up its cells and tissues, and helping to form the root, stem, branches, leaves, flowers, and fruit. It is true that there is one division of plants—the funguses, or mushrooms—which cannot live on mineral food, but which prefer decaying animal or vegetable matter; but these form an exception. We see, then, that there is a marked difference between the food of animals and the food of plants. The food of animals is chiefly organic matter, but the food of plants is chiefly inorganic (or mineral) matter.

3. Food in the Seed.—All seeds contain within themselves a small supply of food, which is sufficient for the young plant until it has put forth its root and one or two of its leaves; after which it has to seek food for itself. If we put a few broad beans

to soak for a night in warm water, we shall be able easily to open the beans in the morning, and to notice the parts of which they are composed. If we look very carefully, we may see two tiny whitish projecting points lying between the two thick fleshy halves of the seed. One of the little projections is the young stem, and the other is the young root; the two thick halves of the seed are really the first pair of leaves, and they are called the *seed-leaves*. These leaves are so thick



FIG. 1.—Seed of Bean opened.
a, a, Seed-leaves; b, Embryo or young plant.



FIG. 2.—Bean with Seed-leaves shrivelled up.

and fleshy because they contain a store of food for the young plant. If we keep the beans moist by wrapping them up in a piece of damp flannel, on which a little water is poured from time to time to keep up the supply of moisture, and if we also keep them in a warm place, as on the kitchen mantel-piece, we shall be able to watch the growth of the stem and root, while at the same time the seed-leaves shrink up and wither away. A supply of water is needful, because everything that a plant uses as food must be dissolved in water before the plant can make use of it as food.