

Hitherto, we have not been called upon to examine this refuse in our laboratory, but according to Dr. Goessmann, of Massachusetts, they have the following average composition :

## ANALYSIS OF WASTE HOPS.

Water .....	8.98
Nitrogen.....	.98
Potash .....	.11
Phosphoric acid.....	.20
Lime.....	.27
Magnesia.....	.10
Insoluble matter.....	.63

The amounts of phosphoric acid and potash closely approximate those in average soils, though somewhat less than those in the best soils. In nitrogen it is somewhat richer. This may be rendered available by first composting the refuse hop, thus insuring fermentation, converting the nitrogen into compounds more or less soluble. Very little good would result from the application to the soil of the unfermented material.

Incidentally, such fermented refuse would improve the soil by its decomposing organic matter, which is of value apart from its contained nitrogen. Since this material cannot in any sense be considered a rich or concentrated fertilizer, its cost at the farm must be carefully considered before decision can be arrived at as to whether it is an economical manure to use or not.

### Spraying and Spraying Pumps.

**592. SIR.**—Will you kindly inform me through your valuable journal which is the best spraying machine to use : also, the best liquid preparation for general spraying for apple scab, wooly aphis, etc.

N. BUTCHERAT, *Port Moody, B. C.*

*Reply by Prof. J. Craig, Central Experimental Farm, Ottawa,*

Probably the best and most useful liquid for spraying is that known as Bordeaux mixture. This has the advantage of being useful both for insects and fungous diseases ; being a combination of copper sulphate and lime, and, when used for insects, Paris green may be added with safety. It has some disadvantages, in that it is more difficult to apply than the ammoniacal copper carbonate, which does not clog the nozzle to the same extent, and it can also be applied later in the season without fear of staining the fruit.

The best spraying machine to use will depend somewhat on the amount of work required of it. For a large orchard it is desirable to purchase a machine operated by horse power. These are offered for sale by a number of pump makers ; among them the Field Force-Pump Co., Lockport, N.Y., and the Nixon Nozzle Co., Dayton, Ohio, and others. For ordinary field work, where the area