



HURST'S **WHY, HOW AND WHEN** **TO SPRAY**

A COMPLETE TREATISE
ON THE
SCIENCE OF SPRAYING

PUBLISHED BY
THE H. L. HURST MFG. CO.
CANTON, OHIO

The City National Bank of Canton.

CANTON, OHIO.

Nov 8, 1909.

To whom it may concern:-

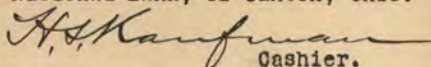
Gentlemen:-

We have known the H. L. Hurst Mfg. Co., of Canton, for a number of years, during which time they have been customers of this Bank, and we have had constant business relations with them, and have found them always prompt and reliable in their dealings. We regard them responsible, and their methods honest, and we believe they will faithfully carry out any agreement made by them, and fulfill every guarantee that they give.

Very truly yours,

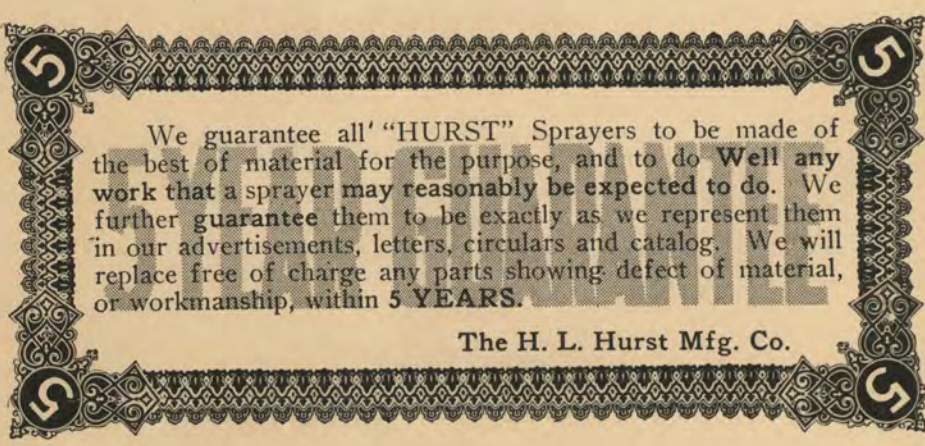
The City National Bank, of Canton, Ohio.

By



Cashier.

OUR FIVE-YEAR GUARANTEE



We guarantee all "HURST" Sprayers to be made of the best of material for the purpose, and to do Well any work that a sprayer may reasonably be expected to do. We further guarantee them to be exactly as we represent them in our advertisements, letters, circulars and catalog. We will replace free of charge any parts showing defect of material, or workmanship, within 5 YEARS.

The H. L. Hurst Mfg. Co.

FAC-SIMILE OF GUARANTEE SENT WITH EVERY SPRAYER

THE H. L. HURST MANUFACTURING CO.

Manufacturers of
QUALITY SPRAYERS



The Home of Hurst Quality Sprayers

THE LARGEST EXCLUSIVE SPRAYING
MACHINE FACTORY IN THE WORLD

CATALOGUE No. 15

CANTON, OHIO, U. S. A.



1. H. L. HURST, President.

2. E. H. LAMIELL, Treasurer and General Manager.

3. A. RODGERS, Sales Mgr.

4. J. Z. LAMIELL, Director.

5. General Manager's Office.

6. Secretary's Office.

7. General Office.

8. Partial View of Assembling Room.

9. Partial View of Machine Department.

10. Superintendent's Office.

11. Partial View Power Sprayer Assembling Room.

12. One Corner Shipping Department.

13. One Day's Mail.

14. Corner Blacksmith Department.

15. Painting Department.

16. View of Assembling Room.



SPRAYOLOGY

THERE is no need for us to tell the American or Canadian farmer nowadays that there is an "absolute necessity" for spraying. If the fruit grower and farmer would preserve his truck, small fruits, apples, potatoes, vineyards and other money-makers, from the ravages of scale, blight, rot, etc., he must apply at the proper time spraying solutions that will cut short the life of these profiteers. The question then is not a matter of the profit and necessity of spraying but of which sprayer you should buy. We have been manufacturing sprayers exclusively for over a quarter of a century and this long experience together with our large and complete factory and skilled workmen places us in a position to supply you with the very latest and best sprayers at the very lowest prices. When you buy a sprayer from us you not only get the very best money can buy, but you get a 10-days' free trial, 5-year guarantee and the assurance of being entirely satisfied with the transaction as we will do anything within reason to satisfy our customers. We ship all repairs the same day the order is received which protects you against expensive delay in case of a break-down in busy season.

In the following pages we have described by word and illustrations our various styles of spraying machines. You will notice their adaptability; the care with which they are put together; the high quality of materials; the simplicity of their operation, and the ease with which they are adapted either to truck growing or small fruit raising; for orchards, for park use, for white-washing, painting, and any other use to which a sprayer can be put.

THE H. L. HURST MANUFACTURING CO.

Established 1887.

CANTON, OHIO, U. S. A.

Price Sells - Quality Satisfies - We have Both.

When You Buy a Hurst You Get The Best.



HURST



CANTON



Why, How and When to Spray

THE prospects for the fruit-growing industry in this country could not be better, and it is my opinion that good, clean, sprayed fruit will always command a price that will be highly profitable to the grower. There is no danger of an over-production of fruit, but what we must overcome is under-consumption which is brought about by the marketing of small, scabby, wormy fruit that is unfit for use. When the consumer sees this fruit displayed in the stores, he has no desire for it. Just as soon as fruit growers generally wake up to the fact that it is unprofitable to market a poor class of fruit, and begin to prune, spray, fertilize and cultivate their fruit, the consumption will automatically increase as the very sight of nice, clean, sound, rosy-cheeked fruit which is bound to result from scientific methods in culture, will create an appetite and desire for this fruit on the part of the customers, and thereby increase the consumption.

These conditions are confronting the fruit grower today and he must recognize them if the fruit-growing industry of the future is to be a success.

The necessity of spraying to prevent the ravages of insect and fungus pests is no longer questioned, but the results obtained by different growers have been varied for the reason that some growers do not do the work thoroughly and therefore do not get satisfactory results, while others who have given the subject of spraying careful study and do the work thoroughly, year in and year out, have reaped big profits.

Even when properly done the results obtained from spraying are not uniform from year to year, as some years conditions are more favorable to the development of insect and fungus pests than others. These conditions are responsible for the fact that some growers who have tried spraying only one year condemn it on the grounds that it did not increase their yield or the quality of their fruit. In the course of our business I have been in hundreds of orchards and have talked with thousands of fruit growers. The successful growers spray every year rather as a preventative than a cure, and it is this thorough systematic spraying that is responsible for their success and large profits.



One of the reasons why spraying is more necessary now than years ago is that the forests have largely been denuded and the insects which inhabited them are compelled to prey on fruit and truck crops. This condition is growing worse from year to year and the only remedy is thorough spraying.

The San Jose Scale especially has presented a serious problem for the fruit grower, but where proper spraying methods were used the disease has been kept in control or eradicated entirely. The question of scale is merely a question of spraying with the proper solutions at the right time.

The spread of the scale diseases, which has been largely due to the neglect on the part of farmers generally to spray their orchards has brought about the enactment of compulsory spraying laws. State authorities have taken a hand in the matter because they have been solicited by the progressive growers who spray their trees and want their neighbors to spray also not only as a protection to them but to the fruit industry at large, and because they realize the importance of fruit growing as a business.

The profits to be derived from spraying are not by any means confined to the fruit industry as is indicated by the results obtained by some of the Experiment Stations, the reports of which appear on page 7. Numerous field and truck crops, including strawberries, onions, celery, tobacco, cotton, cranberries, hops, vineyards, etc., require spraying for fungus and insect pests.

In presenting this spraying guide to the public it is my aim to give our customers and friends the complete science of spraying in language and form that will be easily understood and applied, and containing all the information necessary to do scientific and efficient work.

The formulas given in this guide have been thoroughly tried out and have proven successful. I am indebted to a number of the State Experiment Stations for assistance, but for the most part the information was obtained from actual, practical, field and orchard experiments.

Yours very truly,

E. H. LAMIELL, *Treas. and Gen. Mgr.*

THE H. L. HURST MANUFACTURING COMPANY.

Thorough Spraying Gets Results.

Spraying is an Investment not an Expense.

It's Better to Spray Than to Wish You Had.



Fig. 31—Sketch of Potato Leaf, showing spots produced by Early Blight Fungus. After Jones.

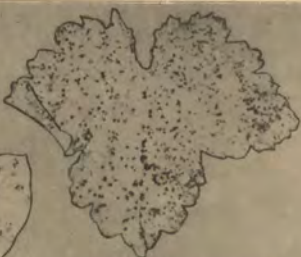


Fig. 32—Currant Leaf-spot.



Fig. 33—Leaf Blight of Tomatoes.



Fig. 34—Section of Potato decayed by Late Blight



Fig. 35—Strawberry Leaf Blight.



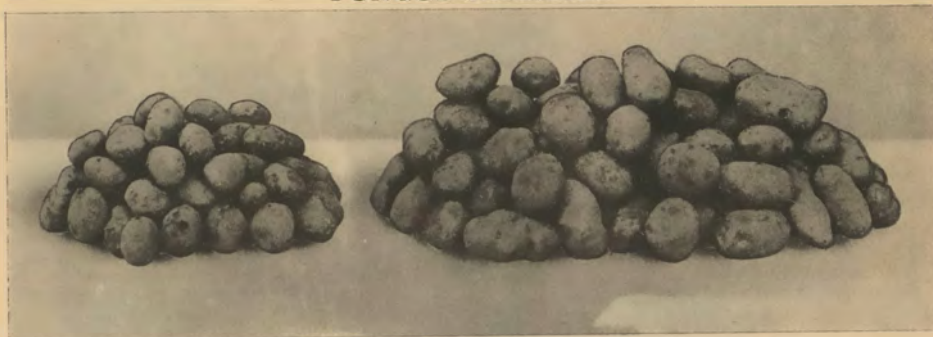
Fig. 36
Peach Leaf Curl



Fig. 37—Photograph of Potato Leaves diseased with Late Blight. After Clinton.

Remedy for Potato Blight, shown in Figures 31, 34 and 37, use formula No. 1 or 5. For Currant Leaf Spot, Leaf Blight of Tomato, Strawberry Leaf Blight, and Peach Leaf Curl, as shown in Figures 32, 33, 35 and 36, use formula No. 1, or weakened Lime-Sulphur.

FUNGUS DISEASES



Actual Facts from Experiment Stations

Above is shown the beneficial effect of treatment with Bordeaux mixture. The sprayed vines yielded marketable tubers at the rate of 291 bushels per acre, while those unsprayed yielded only at the rate of 99½ bushels per acre.

It is hardly believable, but the United States Department of Agriculture reports the "annual loss" by insect pests to truck crops, which, of course, includes potatoes, to be \$53,000,000.00, while the total loss is \$700,000,000.00. They say this statement is rather below the average than above it. Raising potatoes nowadays without spraying means often partial and sometimes complete failure. Blight and rot have been so thoroughly introduced and seem to be almost a part of the soil in many vicinities, that the only way to fight it is by spraying. Most potatoes which rot in the ground and after they are dug, could be saved by keeping the plants free from blight by spraying. The blight keeps the tubers from developing to maturity.

FUNGUS ENEMIES OF THE POTATO

There are at least two distinct fungus diseases which are called the **Potato Rot** or **Potato Blight**. One of these is the **Late Blight** or **Downy Mildew**, due to fungus *phytophoro infestans*, and the other is the **Early Blight** or **Leaf-Spot Disease**, due to the fungus called *alternaria solani*. They may usually be distinguished by the fact that leaves affected by the former have on their under surface a white, velvety mould, visible to the naked eye, but more readily seen through the microscope; with the Early Blight no such mildew is present. With both, the foliage of plants attacked becomes spotted and brown, and the spots gradually enlarge, finally involving the whole leaf, and then cause the stem to wilt and wither.

According to Prof. F. L. Scribner, the life-history of the **Downy or Mildew Potato Rot Fungus** may be summarized as follows: "The spores lighting upon the leaves of the potato germinate in drops of dew or rain, and the product of germination—the zoospores—penetrate to the interior tissues of the plant, and after growing for a time through these tissues, the mycelium sends out, chiefly from the under surface of the leaves, slender fruiting branches, whereon are produced a new crop of spores. These may carry the disease to the other plants in the field, or to the other parts of the same plant; that is, they serve to spread the disease in the tops, which we term blight, over the entire field, or by being washed into the ground they may reach the tubers and cause the rot. The fungus once having gained entrance to the tubers, may or may not vegetate rapidly. Its presence, however, is soon made evident by a browning of the flesh underlying the skin, and by more or less extensive discoloration and depression of the latter." When such affected tubers are planted, the disease is very likely to develop in the plants from them.

Remedies—A number of experiments have shown that these diseases may be prevented by spraying with the Bordeaux mixture. Spray from two to four times, making the first application when the vines are about one-half grown, or earlier, if signs of the disease appear, and repeat the application when it is washed off—in about a fortnight usually. Add half a pound of Paris Green to each barrel of the mixture whenever the Colorado Beetles threaten injury. Arsenate of lead can also be used with Bordeaux mixture. For Formulas—Bordeaux Mixture etc., see pages 11 and 12.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



Fig. 27—Black Rot of Apple due to *Sphaeroopsis Malorum*.



Fig. 28—Brown-rot on Plum.

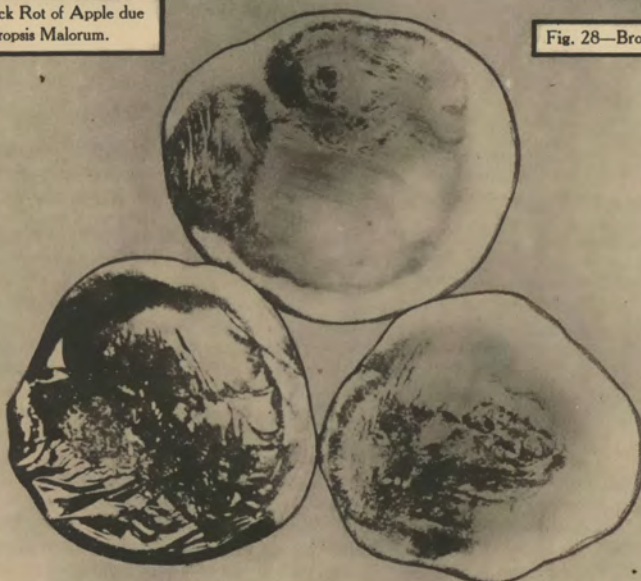


Fig. 29—Black Rot of Tomatoes.



Fig. 30—Work of the Bitter Rot Fungus (*Glomerella rufomaculans*.) Natural size,

Remedy for Black Rot, Brown Rot and Bitter Rot of apple, and also Black Rot of Tomato, as shown above, use formula No. 3, 6, or 6-2.



APPLE SCAB

This disease appears on both fruit and leaves in the form of whitish scabby spots, and not only prevents the fruit from maturing, but causes it to become hard and tough. Spray with Bordeaux or weak solution of lime-sulphur, 10 days before buds open, followed by 2 or 3 more applications at intervals of 2 weeks. See Figure 24, page 10.

BLACK ROT OF APPLE

This is somewhat similar to Bitter Rot, but more completely covering the fruit, and quite frequently causes the fruit to stick to the tree. Spray the same as for Bitter Rot. See Figure 27.

BROWN ROT

This disease is distinguished by its dryness of nature, or brown color, and common on the plum and peach. It sometimes destroys blossoms before fruit is set. Spray with Bordeaux or weak solution of lime sulphur before the blossoms open and repeat when fruit is set, and later if necessary. See Figure 28.

BLACK ROT OF TOMATO

This disease first appears on the blossom end of the fruit from the time it is half grown until ripening. Spray with Bordeaux mixture when fruit begins to set, and repeat at intervals of 2 weeks for 3 or 4 sprayings. See Figure 29.

BITTER ROT

This disease appears on the fruit before ripening, causing it to rot and drop from the tree. Spray with Bordeaux or weak solution of lime-sulphur, beginning about 4 weeks after fruit has formed, and at intervals of 2 weeks thereafter for several applications. See Figure 30, page 8.

GRAPE

Downy or powdery mildew, black rot, and anthracnose all have very much the same effect, due to fungus origin. Spray with Bordeaux or weakened lime-sulphur just before the buds swell in early spring. Then repeat every 2 weeks until fruit begins to ripen. See Figure 25, page 10.

PEAR SCAB

Appears in whitish scabby spots on fruit and also spots on leaves very much the same as on the apple. Spray with Bordeaux, or weak solution of lime-sulphur, the same as for the apple. See Figure 26, page 10.

ANTHRACNOSE OF BEAN

This disease is known by the appearance of brown spots on the pods and leaves. Spray with Bordeaux mixture, beginning when vines are about 6 inches tall and repeating 2 or 3 times. See Figure 21, page 10.

SOOTY BLOTCH OR FUNGUS

This causes a blackened spotted appearance on the fruit, especially the early varieties. Spray with Bordeaux or weak solution of lime-sulphur, when the fruit is well formed. See Figure 23, page 10.

CURRANT LEAF SPOT

Known by numerous discolored and dead spots appearing on the leaves. Spray with Bordeaux solution when leaves first appear, and repeat 2 or 3 times at intervals of 10 days to 2 weeks. See Figure 32, page 6.

LEAF BLIGHT OF TOMATOES

The first appearance is of tiny brown specks on plants in seed bed, which slowly enlarge into irregular discolored spots. With first appearance spray seedlings with Bordeaux once a week until transplanted. Repeat several times with the same at intervals of 2 weeks in the field. See Figure 33, page 6.

STRAWBERRY LEAF BLIGHT

Known by circular discolored spots on the leaves with a whitish center and purplish border. Spray, before blossoms open, with Bordeaux or weakened solution of lime-sulphur, and repeat after fruit has been harvested. See Figure 35, page 6.

PEACH LEAF CURL

Leaf curl is an old disease of the peach, which develops in early spring soon after the first leaves have made their growth. The leaves become much thickened, curled, yellow, and finally blacken and drop off. Rainy and cloudy weather makes the conditions worse for this disease. Spray with Bordeaux or weakened lime-sulphur early in spring. See Figure 36, page 6.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



Fig. 21—Anthracnose of Bean.



Fig. 22—San Jose Scale on a pear; b scale enlarged.
(Howard Cir. 3, B. of Ent., U. S. D. A.)

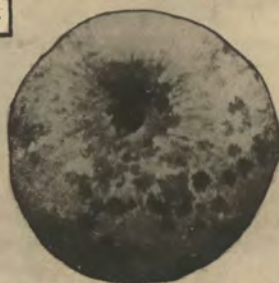


Fig. 23—Sooty Blotch of Apple.



Fig. 24—Apple-scab



Fig. 25—Downy mildew of grape.
After Freeman.



Fig. 26—Pear-scab.

Remedy for Anthracnose of Bean, shown in Figure 21, use formula No. 1. For Scale on pear, shown in Figure 22, see San Jose Scale. For Sooty Blotch, Apple Scab, Downy Mildew and Pear Scab, as shown in Figures 23, 24, 25 and 26 above, use formula No. 1.



FUNGICIDES

1

BORDEAUX MIXTURE I

Copper sulphate (blue vitriol), 4 pounds.
Quicklime (not air slaked), 4 pounds.
(Or dry air slaked lime or hydrate of lime one-fourth more.)
Water to make 50 gallons.

Dissolve the copper sulphate in about two gallons of hot water, contained in a wooden vessel, by stirring, or, even better, by suspending the sulphate, contained in a cheese cloth sack, in a large bucketful of cold water. With the cold water and cheese cloth bag a longer time is required. Pour the sulphate solution into the barrel or tank used for spraying, and fill one-third to one-half full of water. Slake the lime by addition of a small quantity of water, and when slaked cover freely with water and stir. Pour the milk of lime thus made into the copper sulphate, straining it through a brass wire strainer of about 30 meshes to the inch. Pour more water over the remaining lime, stir, and pour into the other; repeat this operation until all the lime but stone lumps or sand is taken up in the milk of lime. Now add water to make 50 gallons in the tank. After thorough agitation the mixture is ready to apply. The mixture must be made fresh before using, and any left over for a time should be thrown out, or fresh lime added.

2

BORDEAUX MIXTURE II

Copper sulphate, 2 pounds.
Quicklime, 2 pounds.
(Or dry air slaked lime or hydrate of lime one-fourth more.)
Water to make 50 gallons.
For use on such trees as have foliage injured by Bordeaux I.

Stock Solution and Lime Putty

A solution of copper sulphate, containing, say, one pound of sulphate to the gallon of water, may be made up and permitted to stand indefinitely in a covered barrel, if no lime is added. Such a solution is known as a stock solution, and two or four gallons of this stock solution, according to the strength desired, is taken for each 50 gallons of the mixture to be made. For extensive spraying, a long trough or box of uniform width may be used, in which to slake and keep the lime. The quicklime is weighed out according to the amount needed, immediately placed in the trough and slaked with a small quantity of water. The whole is evenly spread and covered as a putty with water to exclude the air. This putty may be removed in calculated portions, placed in a tub and treated like the freshly slaked lime. By means of stock solution of copper sulphate and the lime in putty state, much valuable time is saved filling the barrels or tanks used in spraying.

3

SODA BORDEAUX MIXTURE

Copper sulphate, 4 pounds.
Commercial caustic soda, soda lye (sodium hydroxid), slightly in excess so that mixture is alkaline—according to strength, 1 lb. 5 oz. to 1 lb. 8 oz. by testing.
Water to make 50 gallons.

To use instead of ammoniacal copper carbonate.

Warning—In each case of change of grade or brand of commercial caustic soda it will be necessary to test the strength. Keep the mixture well agitated.

To Test the Strength of Caustic Soda

Provide material and appliance described in Bulletin 130 and test carefully the reaction with both red and blue litmus. It is not safe to use this mixture without testing each lot of caustic soda used.

To Keep Caustic Soda—After opening a container and testing, weigh out the entire contents into portions such as are needed to make a single spray tank of mixture; put in Mason jars under shelter, cover with a pint or so of water and this portion is ready to be used as needed. Opened packages of caustic soda will absorb water and increase in weight on standing; unopened packages will usually keep for a year or more.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



HURST



CANTON



4

COPPER SULPHATE SOLUTION

Copper sulphate, 4 pounds.
Water to make 50 gallons.

Dissolve the sulphate as directed in Bordeaux I.

Caution—The solution will injure foliage. It can be used only before the buds open.

5

BORDEAUX MIXTURE AND IRON STICKER

Copper sulphate (blue vitriol), 2 pounds.
Iron sulphate (Copperas), 2 to 3 pounds.
Quicklime, 4 to 5 pounds.
(Or dry air slaked lime or hydrate of lime one-fourth more.)
Water to make 50 gallons.

Proposed and recommended as substitutes for Bordeaux I. upon most fruits in foliage and upon certain vegetables, including especially apples, grapes, and potatoes. The iron sulphate is precipitated by the lime as hydroxid and serves as a dilution sticker. The spray is rusty colored by reason of this iron compound.

Note: A stronger 4-4-8-50 formula may be used on apple, pear and plum before blossoms open.

Caution—Do not leave solution of iron sulphate standing beyond a second day; better to make fresh for each day.

6

SELF-BOILED LIME-SULPHUR MIXTURE

Stonelime (only), 10 pounds.
Flowers of sulphur, 10 pounds.
Water to make 50 gallons.

Place the lime and sulphur together in a barrel or kettle and add enough cold water to slake the lime. Stir thoroughly and add more water if necessary to prevent the mixture from becoming sticky. As soon as the lime is well slaked, dilute immediately with cold water and strain through a sieve of about 20 meshes to the inch to remove coarse particles of lime, but the sulphur should all be worked through the strainer.

Proposed and recommended by W. M. Scott, U. S. Department of Agriculture, as a fungicide for use on peach trees in foliage. A 15-10—50 formula may also be used on the apple as a substitute for Bordeaux mixture.

CAUTION—While this may be used on the peach in foliage, and upon other fruits, care should also be exercised in the preparation of the mixture to avoid the formation of soluble sulphids as by the use of hot water or allowing to stand before dilution, since these result in foliage injury from the spray.

6—2

COMMERCIAL LIME SULPHUR

May be used as a fungicide in weak form, say, 1 gallon to from 40 to 75 gallons of water. It can be used in the 1-40 proportion for apple, and somewhat weaker for pear and peach.

VALUE OF LIME SULPHUR SOLUTION

In addition to being used as a fungicide the commercial lime sulphur is quite as valuable for the destruction of all scale diseases, but of course must be used much stronger and also when the trees are dormant. The use of lime sulphur for scale acts as a cleanser, producing a smooth growth of the bark, and affording no lodging place for codling moth or other insect pests. A rough bark affords a fine wintering place for such pests. As a fungicide the use of lime sulphur in a weak form makes clean fruit and eliminates the danger of rusty fruit, which is often caused from the use of bordeaux.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



READY PREPARED SOLUTIONS

Unless one has a large amount of spraying to do, and is well equipped to mix his own solutions, it is more economical and satisfactory to use the ready prepared chemicals.

To make sure that our customers get absolutely reliable preparations, so that they will secure the greatest possible returns and satisfaction from their spraying, we have contracted with one of the largest and most reliable chemical manufacturers in the country for an enormous quantity of all of the most commonly used fungicides and insecticides.

These we offer to our customers at only a slight advance in price over the cost to us to cover our expenses.

We recommend each and every preparation as being thoroughly reliable and know that they will give the very best results possible if properly used.

GRASELLI ARSENATE OF LEAD PASTE

600 lb. kegs.....	.08c per lb.	20 lb. pails.....	.11c per lb.
300 lb. kegs.....	.08½ per lb.	10 lb. pails.....	.12½ per lb.
50 lb. kegs.....	.09¾ per lb.	5 lb. pails.....	.13¾ per lb.
100 lb. kegs.....	.09 per lb.	1 lb. pails.....	.18 per lb.

Terms cash, F. O. B. our nearest shipping point.

*(See below.)

An arsenical poison for the destruction of all leaf-eating insects such as Colorado Potato Beetle (common potato bug), Codling Moth (common apple worm), Curculio (the insect that stings fruit), and all insects that feed upon vegetation of trees, shrubbery or vegetables. Sticks well to the foliage and not easily washed off by rain. For all insect pests use Arsenate of Lead Paste in the proportion of 3 to 5 pounds to 50 gallons of water.

GRASELLI ARSENATE OF LEAD POWDER

100 lbs.....	.21 per lb.	5 lbs.....	.26 per lb.
50 lbs.....	.22 per lb.	1 lb.....	.30 per lb.

Terms cash, F. O. B. our nearest shipping point.

*(See below.)

Used the same as the paste but has twice the strength and therefore will go twice as far. Will keep indefinitely. Use diluted in water 1½ to 3 pounds to 50 gallons of water.

GRASELLI BORDEAUX MIXTURE PASTE

Bbl. lots.....	.06 per lb.	20 lb. pails.....	.08½ per lb.
100 lb. kegs.....	.06¾ per lb.	10 lb. pails.....	.10 per lb.
50 lb. kegs.....	.07½ per lb.	5 lb. pails.....	.11½ per lb.
		1 lb. pails.....	.17 per lb.

Terms cash, F. O. B. our nearest shipping point.

*(See below.)

This is used for all fungus diseases such as blight on potatoes or fruit trees. Used in the proportion of 10 pounds to 50 gallons of water.

GRASELLI LIME-SULPHUR SOLUTION

50 gal. bbls.....	.15 per gal.	5 gal. cans.....	.35 per gal.
25 gal. bbls.....	.18 per gal.	1 gal. cans.....	.45 per gal.

Terms cash, F. O. B. our nearest shipping point.

*(See below.)

Used largely to destroy San Jose, Oyster Shell and all other scale and sucking insects. Also a valuable fungicide. Especially satisfactory as a substitute for Bordeaux Mixture to control scab, leaf spot and various fungus diseases affecting apples and pears.

When spraying during dormant season for scale use in proportion of 1 gallon Lime-Sulphur to 8 gallons of water.

When using as a fungicide for apple scab and other fungus diseases use in very diluted form in proportion of 1 gallon to 40 gallons of water.

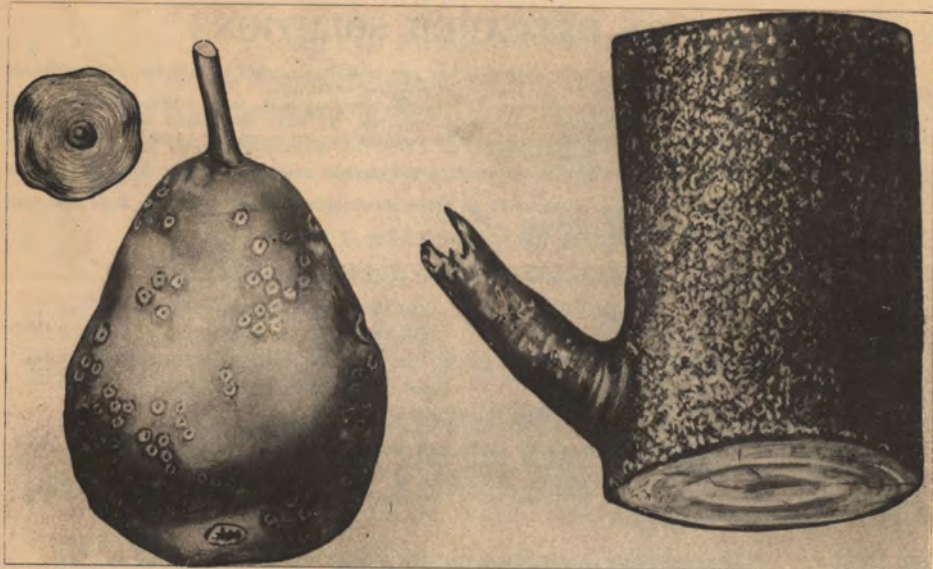
*(The above solutions are carried in stock and can be shipped from the following cities, thus saving our customers long delays in transit and a considerable amount in freight costs.)

Shipping Points—Cleveland, Ohio, Chicago, Ills., Birmingham, Ala., and Grasselli, N. J.

"SCALECIDE"—FOR ALL SCALE DISEASES

A number of the Experiment Stations have recommended the use of Scalecide, which is a ready-made preparation. We carry a supply in stock and can furnish it in one gallon cans at \$1.00; five gallon cans, \$3.25; ten gallon cans, \$6.00; and fifty gallon barrels at \$25.00. We pay freight on barrel lots to points east of Mississippi River, and north of Ohio River, and north of Carolina State line. One gallon of Scalecide makes twenty gallons of solution, nineteen gallons of water being added.

INSECT PESTS



THE SAN JOSE SCALE

THIS pest is one of the most destructive insects that the fruit grower has to contend with, and is now generally distributed over the United States, doing an enormous amount of damage. This insect infects practically all deciduous trees, and, if not stopped will eventually destroy them. It multiplies with marvelous rapidity, one pair breeding thousands in a single year.

It is flat, pressed close to the bark, and resembles the bark of the twigs in color, and when fully grown is about one-eighth of an inch in diameter. At or near the middle of each Scale is a small, round, slightly elongated black, or yellow point. When the Scales occur on the bark of the twigs or leaves, and in large numbers, they lie close to each other, frequently overlapping, and are at such times hard to distinguish without a magnifying glass. The general appearance which they represent is of a grayish, very slightly roughened scurvy deposit. The pest is transmitted from one orchard to another by birds, by being carried by the wind, and from nursery stock that is affected by it. The only remedy for the San Jose Scale is to spray, and the most successful remedies now being used are Crude Petroleum, or the Lime-Sulphur and Salt Wash, the latter being the most effective.

In many states the legislatures have passed laws compelling the spraying of all trees infected by the pest, which is very good, for if the pest were allowed to grow unmolested it would soon cut short the fine fruit for which our country is well known. Let your watchword be, **SPRAY, SPRAY, SPRAY**. It is the only insurance for your orchard.

SCURFY SCALE

The general appearance is elongated and of light grayish color, the effects being much the same as the other scale diseases. Spray in May or June, when young lice are hatching out, with 10 per cent. kerosene emulsion, or weak solution of scalecide, applying it to the trunks and larger branches only. See Figure 2, page 15.

HOWARD SCALE

Similar to the San Jose Scale in appearance and effects, but not so widely spread and under better control. It is more prevalent in the States of the Middle West. Spray with lime-sulphur or scalecide, the same as for San Jose Scale. See Figure 5, page 15.

OYSTER-SHELL SCALE

These elongated scales, resembling miniature oyster shells, sometimes completely cover the bark. Spray with scalecide or lime-sulphur while the trees are dormant. See Figure 6, page 15.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



Fig. 1—The San Jose Scale. Infested and uninfested twigs with drawing at the right showing a single scale, much enlarged.



Fig. 2—The Scurfy Scale. (Bureau of Entomology U. S. Dept. A.)

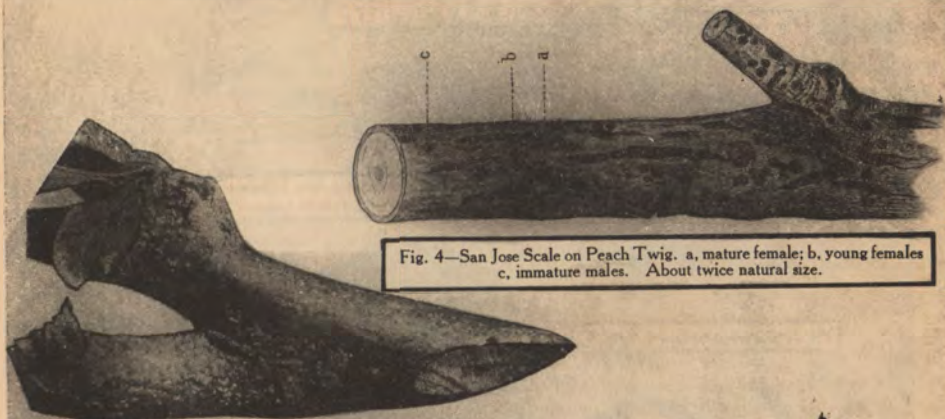


Fig. 4—San Jose Scale on Peach Twig. a, mature female; b, young females; c, immature males. About twice natural size.

Fig. 3—Plum twigs with Scale.



Fig. 5—Pear Twig infested with Howard Scale. (*Aspidiotus Howardii*) easily controlled by Lime and Sulphur Spray.



Fig. 6—*Lepidosaphes Ulmi*, Oyster-shell Scale. a, female scale from below, showing eggs; b, same from above, greatly enlarged; c, female scales; d, male scale, enlarged; e, males on twig, natural size: (After Howard, Yearbook of U. S. Dept. of Agr.)

Remedies for San Jose Scale, Scurfy Scale, Howard Scale and Oyster-Shell Scale as shown in Figures 1 to 6. See formula No. 15, Page 23, also Scalecide. See page 13.



Fig. 7—Woolly Aphis on an apple twig.



Fig. 8—Codling Moth. a, burrow in apple; d, pupa; e, large worm; f, moth with wings closed; g, moth with wings opened; i, cocoon. (Riley, B. of Ent., U. S. D. A.)



Fig. 9—Currant-worms.



Fig. 11—Cabbage Worm and Butterfly.



Fig. 10—Pear Slug, from Saunders. Insects Injurious to Fruits.



Fig. 12—Cherry Slug.



Fig. 13—Bud-moth, from Davis.



Fig. 14 Stages and work of Spring Canker-worm. 1, male moth; 2, canker-worms or larvae; 3, work of the larvae, only the midribs of leaves being left; 4, egg mass on bark scale. (After Quaintance, U. S. Dept. of Agr. Bul. No. 68.)



Fig. 15 Canker of Pears. One-half natural size.

Remedy for Woolly Aphis, shown in Fig. 7, use formula No. 7. For Codling Moth, shown in Fig. 8, use formula No. 9. For Currant Worm, shown in Fig. 9, use formula No. 11. For Pear Slug, shown in Fig. 10, use formula No. 9. For Cabbage Worm shown in Fig. 11, use formula No. 12. For Cherry Slug, shown in Fig. 12, use formula No. 9 in combination with No. 1. For Bud Moth, as shown in Fig. 13, use formula No. 9 in combination with No. 1. For Canker Worm, shown in Fig. 14 and 15, use formula No. 9.



WOOLLY APHIS

Distinguished by a white woolly substance on the limbs and trunks of apple trees. Little pink lice are found underneath the woolly substance, which injure the tree by sucking the sap. Spray with kerosene emulsion when trees are in full leaf. See Fig. 7, page 16.

CODLING MOTH

This worm tunnels its way through the apple, usually close to the core, and is one of the most common of all pests. Spray with arsenate of lead just after petals fall. Repeat before calyx closes. See Figure 8, page 16.

CURRENT WORM

These worms usually appear in large numbers and feed on the leaves, often leaving the stems entirely bare and the fruit exposed. Spray with white hellebore when worms first appear, and repeat at intervals of 4 to 5 days, when necessary. See Figure 9, page 16.

PEAR SLUG

This little worm begins its work by eating away the green portion of the leaves. When first appear, spray with arsenite of lead, and repeat at intervals of 10 days to 2 weeks, if it be necessary. See Figure 10, page 16.

CABBAGE WORM

These small green worms rapidly get away with the leaves by eating them full of holes. Spray with Pyrethrum when plants are young. See Figure 11, page 16.

CHERRY SLUG

These small worms work on the leaves, eating away the green portion. Spray with arsenate of lead in combination with Bordeaux when leaves first appear. See Figure 12, page 16.

BUD MOTH

These caterpillars eat the young leaves when unfolding in the early spring. Spray with arsenite of lead in Bordeaux when buds open. Repeat about 2 weeks later, if necessary. See Figure 13, page 16.

CANKER WORMS

These slender looping worms, so common in the spring when they feed on the green leaves, are easily killed by spraying with arsenate of lead. See Figure 14, page 16.

PLUM CURCULIO

The grubs infest the growing fruit, causing it to fall off before maturing. Spray with Bordeaux and arsenate of lead combined just after blossoms have fallen. Repeat in ten days and at intervals of two weeks, if necessary, until fruit has become well grown. See Figure 16, page 18.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



Fig. 16—Plum Curculio: Adult female on plum, showing the circular feeding punctures and the crescentic egg-laying punctures, enlarged. (Cir. 73 Bureau of Entomology, U. S. D. A.)



Fig. 17—Cucumber-beetle, enlarged.



Fig. 18—Potato Flea-beetle, enlarged. (After Chittenden, Bul. 19, N. Ser. Bureau of Entomology U. S. Dept. of Agriculture.)



Fig. 19—Colorado Potato Beetle. (After Walsh and Riley, American Entomologist)



Fig. 20—Asparagus Beetle, enlarged. a, adult beetle; d, larva; c, young larva; b, egg; e, pupa. (Chittenden, year book Dept. Agr. for 1896.)

Remedy for Plum Curculio shown in Figure 16. Use formula No. 9 in 1. For Cucumber Beetle, shown in Figure 17, use formula No. 9 or No. 1 and 9 combined. For Potato Flea Beetle, shown in Figure 18, use formula No. 9. For Colorado Potato Beetle, shown in Figure 19, use formula No. 9. For Asparagus Beetle, shown in Figure 20, use formulas No. 12 as powder, or No. 9.

COLORADO POTATO BEETLE

The Colorado Potato Beetle (Bug) deposits its orange-colored eggs in masses, varying in number from a dozen to fifty or more, on the under surface of the potato leaf, and occasionally also upon the leaves of grass, smart-weed, or other plants in the potato field. They hatch about a week later into peculiar little grubs that feed upon the foliage a few weeks. They then descend to the ground, where, just beneath the soil surface, or under the rubbish above it, they change to pupæ. About ten days later they emerge as perfect beetles. There are from two to four annual broods, the number varying with the latitude; and the insect hibernates in the beetle state.

Remedies—Spray with almost any of the arsenical poisons. Arsenate of lead has been found best by the Maine Experiment Station. The application should be made as soon as the beetles appear, in order to kill off the first brood, and it must be repeated as often during the season as is necessary to keep the pest in check.

POTATO FLEA BEETLE (Bug)

The Flea Beetle, shown on page 18, is one of the most troublesome insect pests affecting potatoes. Although very small, it appears in enormous numbers and eats small holes in the surface of the leaves. They thus not only injure the tissues of the leaf directly, but the holes they make furnish easy access to the spores of disease-producing organisms.

Remedies—Spraying with arsenate of lead and Bordeaux mixture will prevent, to a great extent, at least, the depredations of this pest. The more thorough the application the more effective it will be.

CUCUMBER BEETLE

There are two species of this beetle, the striped and the spotted. The striped beetle has a yellow body with black stripes, while the spotted has black spots instead of stripes. They work very much the same and often together by eating the leaves and stems and soon kill the tender plants. Spray with arsenate of lead alone, or combined with Bordeaux. See Figure 17, page 18.

ASPARAGUS BEETLE

Both the beetles and larvæ devour the foliage. On first appearance of young, dust with lime and pyrethrum. After cutting is over spray with arsenate of lead. See Figure 20, page 18.

ROSE BUG OR CHAFER

These familiar beetles attack roses, grapes and all kinds of fruit trees in large numbers during the summer months, usually in June, and are distinguished by their gray color and long legs. The larvæ feed on the roots of grasses, while the beetles eat the fruit, leaves and blossoms, thus making them unusually destructive.

Remedies—Spray the vines thoroughly, before the bugs appear if possible, with arsenate of lead same as for other insect pests. Repeat the operation as often as necessary.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



Fig. 38—Brown-Tail Moth.



Fig. 39—Fall Web Worm.



Fig. 40—Gypsy Moth.

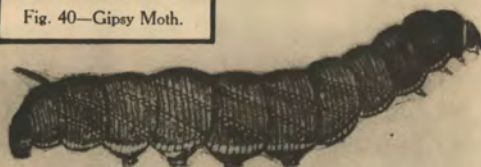


Fig. 41—Tobacco and Tomato
Hornworm Larva.



Brown-Tail Moth Larva.



Fig. 43—Peach Borer Fly.
After Quaintance.



Eggs on Twig.



Fig. 42—Tent Caterpillars and Web.
After Quaintance.



Peach Borer Larva in cavities.
After Quaintance.

Remedy for Brown Tail Moth, Fall Web Worm, Gypsy Moth, Tobacco and Tomato Hornworm, Tent Caterpillar and Peach Borers as shown in Figures 38, 39, 40, 41, 42 and 43. See formula No. 9. Also description on page 21.



BROWN TAIL MOTH

The caterpillars winter in nests and come out in April when they feed on the buds and young leaves. About two months later they spin an open cocoon among the leaves and turn to pupæ. The moths appear a few weeks later—about the middle of July. Several hundred eggs are laid by each female which hatch in August. They are quite as destructive as the Gypsy Moth. The winter nests are made at the end of the twigs by the young caterpillars surrounding the leaves with a silky network. These nests should be burned in the fall or early spring. When the caterpillars begin to hatch spray with Arsenate of Lead. Ready prepared Arsenate of Lead Paste can be used in the proportion of 4 pounds to 50 gallons of water. See Figure 38, page 20.

FALL WEB WORM

This worm is about an inch long, and of a pale yellowish color, with long hairs projecting from the body. As the name indicates, it is most common in the fall, weaving large nets about the limbs of the tree, enveloping the leaves. These nests should be cut away or burned as they appear. Spray with Arsenate of Lead the same as for Brown Tail Moth. See Figure 39, page 20.

GYPSY MOTH

The eggs of this pest hatch in May and June, the moths appearing in July. The caterpillars feed at night and are not to be seen during the day. The full grown larvæ measures about $2\frac{1}{2}$ inches in length, and are sparsely covered with hairs, which project from blue and red warts. The female moth is nearly white with small black markings. Spray with Arsenate of Lead the same as for Brown Tail Moth. See Figure 40, page 20.

TOBACCO AND TOMATO HORN WORM

The caterpillars become very large, sometimes measuring several inches in length, and are characterized by a black or red horn. It feeds on the leaves of the tomato and tobacco plants, devouring them with wonderful rapidity. The moths appear in July and lay the eggs which hatch in about four days, and pass through several stages. About the middle of August they burrow several inches in the soil for winter. Spray with Arsenate of Lead, using about $2\frac{1}{2}$ pounds of the ready prepared paste to 50 gallons of water. See Figure 41, page 20.

TENT CATERPILLARS

A caterpillar measuring about two inches in length and black in color, covered with yellowish hairs. It is also characterized with a white stripe down the middle of its back. The eggs are laid in July in masses around small twigs surrounded with frothy glue. The grubs hatch in the spring, spinning their tent in the crotch of the tree. The larvæ feed at night on the foliage. Spray with Arsenate of Lead in the spring, the same as for Brown Tail Moth. See Figure 42, page 20.

PEACH BORER

This pest is indicated by a gummy mass mixed with sawdust around the trunk of the tree. The eggs are deposited and hatched about 2 inches below the surface of the ground by a moth that is seen on the trees early in the morning. The injury is done by the larvæ boring into the bark stopping the flow of sap. The best method of destruction is by digging the borers out by means of a sharp pointed knife. Cut the tree back heavily. Cultivate thoroughly among the trees and apply manure to induce a strong growth. Then paint the trunk and heavy branches with one part lime and two parts by weight cement, add milk or water to make a stiff whitewash. Apply twice or three times during season. See Figure 43, page 20.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



HURST



CANTON



INSECTICIDES

7

KEROSENE EMULSION

Dissolve one-half pound hard soap in one gallon of water (preferably soft water), and while still boiling hot, remove from the fire and add two gallons of kerosene. Stir the mixture violently by driving it through a force pump back into the vessel until it becomes a creamy mass that will not separate. This requires usually from five to ten minutes. The emulsion is then ready to be diluted with water and applied. For the common scale insects and hard bodied insects, like the chinch bug, use one part emulsion to eight to ten parts of water. For soft bodied insects (plant lice, etc.), use one part emulsion to fifteen or twenty parts water. The stock emulsion will keep good for months if kept in air-tight vessels.

Kerosene emulsion kills by **contact**, and therefore the application should be very thorough. It may be used against a great many different pests, but is especially valuable for destroying those with sucking mouth-parts, for they cannot be killed with arsenical poisons.

Caution—Only the dilute emulsion, 1 part emulsion to 15 or 20 of water, should be used when the trees are in leaf, and in all cases it should be kept thoroughly stirred; otherwise the foliage or even the twigs will be injured.

This insecticide is best used on a bright sunshiny afternoon when a light breeze is stirring, since these conditions hasten evaporation.

8

PARIS GREEN

In combination with Bordeaux mixture, Paris green may be used at the rate of one pound in from 100 to 150 gallons.

When Bordeaux mixture is unnecessary, the Paris green may be used at the same rate, but two or three pounds of freshly-slaked lime must be added to prevent burning of foliage. Keep the mixture well stirred so that the poison will be distributed evenly.

In cases where successive sprayings are necessary it is important to consider the accumulation of the poison and use a slightly weaker mixture, unless sufficient rain has fallen to wash off the poison thoroughly.

9

ARSENATE OF LEAD

Arsenate of soda, 4 ounces.

Acetate of lead, 11 ounces.

Water, 3 to 5 gallons.

Dissolve the ingredients separately, each in one-half to one gallon of warm water. Mix together and pour into spray tank containing from 50 to 100 gallons of water. Add the milk of lime from two or three pounds of freshly slaked stone lime.

This poison is in many respects the most satisfactory for spraying purposes of any of the arsenicals. It is more adhesive than Paris green, and, if properly made from good materials, will burn foliage but little, no matter what strength is used. These remarks especially apply to the commercial brands on the market, which are, in some respects, more satisfactory than the home-made product. While costing more than Paris green, arsenate of lead is generally regarded as more economical in the end, because of its superior sticking quality, hence, greater efficiency. For most purposes, 3 pounds of the commercial product in 50 gallons of spray are used. Either water, Bordeaux mixture, or No. 5 may be used as the carrier.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



10

ARSENITE OF LIME

White arsenic, 1 pound.

Lime, 2 pounds.

Water, 3 gallons.

Boil together for fully 40 minutes after the boiling point is reached. As a precaution against danger of burning, slake an additional pound of lime, add to it three or four gallons of water, and add to the boiled mixture. Strain and dilute to from 200 to 250 gallons for hardy vegetation, such as potatoes. Do not use at all on stone fruits or on cucurbits. Dilute to 300 or 400 gallons for tender vegetation.

11

WHITE HELLEBORE

Because of quickly losing its poisonous properties, hellebore may be employed to spray fruits a few days before harvest, when arsenical sprays would be dangerous. Use one ounce to three gallons of water.

12

WHITE PYRETHRUM

Pyrethrum is usually applied as a powder, with a bellows, but may be used as a spray at the rate of one ounce to two gallons of water. Poisonous to insects, but not to higher animals. Can be used on ripening fruits.

13

TOBACCO DECOCTION

Boil one pound of tobacco stem or tobacco dust in one gallon of water for about one hour. Strain to remove dirt that would clog nozzle and add water to make two gallons of spray for each pound of tobacco used. Excellent for plant lice and does no injury to the most tender plants.

14

ARSENITE OF SODA

Dissolve two pounds of commercial white arsenic and four pounds of carbonate of soda (washing soda) in two gallons of boiling water and use from one quart to three pints to a barrel of Bordeaux mixture (50 gallons).

Orchardists often use one pint of this poison with the addition of one and one-half pounds of commercial arsenate of lead in 50 gallons of Bordeaux for spraying apples. Results seem as good as when full strength arsenate of lead is used, except that more burning of the leaves occurs.

The easiest way to make the solution is to put both the white arsenic and carbonate of soda in a gallon of boiling water and keep boiling about fifteen minutes, or until a clear liquid is formed, and then dilute to two gallons for stock solution.

Caution—This cannot be used alone safely, but must be applied in Bordeaux mixture.

15

LIME-SULPHUR WASH

Stone lime, 15 to 20 pounds.

(Or dry air slaked lime or hydrate of lime, one-fourth more.)

Flowers of sulphur, 15 pounds.

Water, 50 gallons.

Slake the lime in a small quantity of hot water, gradually adding and thoroughly stirring in the sulphur. Dilute mixture with twelve gallons of water and boil in an iron kettle or cook by steam in a covered tank or barrel for one and one-half hours. Fill vessel up with water to the required fifty gallons. Strain the wash through a fine mesh strainer and apply hot. In using an iron kettle, keep the mixture vigorously boiling and thoroughly stirred to prevent caking and burning materials. Wash cooked by steam is more easily prepared and better made.

Apply wash in spring before buds open, or in fall after leaves drop. Cover all parts of the tree with a heavy coat of the wash. If a single application is made per year for scale insects, especially for San Jose Scale, it is advised that the treatment be given in the early spring. Where infestation is excessive, one spraying should be given in the fall after leaves drop, and a second the following spring before the leaves appear. Also in case of large orchards it may be necessary to commence work in the fall so as to insure its completion before vernal in spring. Cover every bit of bark on every tree to insure success.

This remedy is perfectly safe in anybody's hands, if used during the dormant period. It is also a fungicide and controls peach curl as well as San Jose Scale.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



HURST



CANTON



16

SOAP SOLUTIONS

One or two pounds of fish oil soap dissolved in one gallon of water makes a good spray to use against San Jose Scale in winter, but is not as effective or cheap as other remedies. One pound of fish oil soap or laundry soap in 4 to 7 gallons of water is good against plant lice.

17

SOLUBLE OR MISCIBLE OIL

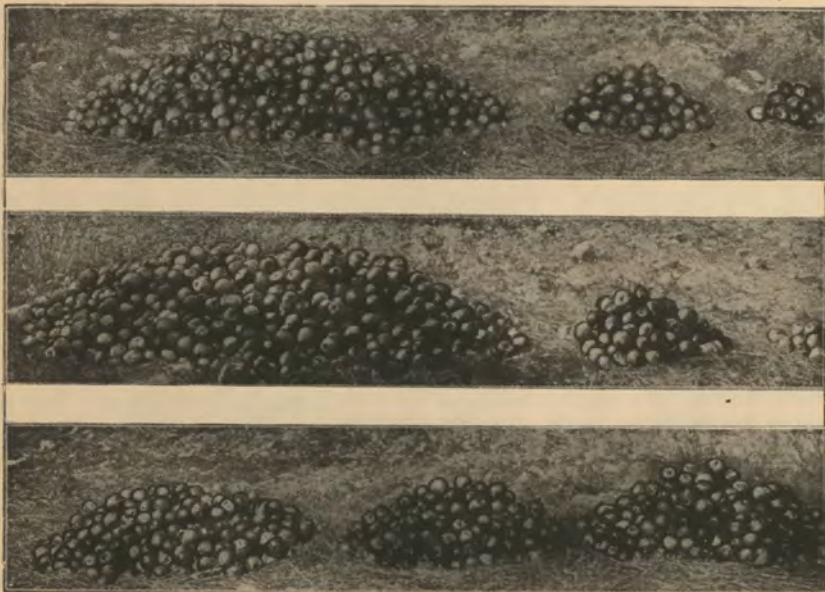
Some commercial houses make brands of oil that readily emulsify with cold water and are used in winter at different dilutions for San Jose Scale and also as summer applications. Some of these are valuable, and if used with care, are recommended as worthy of use.

NOTE

We want to give credit to a number of experiment stations for assistance in making up these reports, which is further assurance that the formulas given are reliable and based on the results of the most careful tests.

The numbers in the spray calendar following refer to numbers in margin of pages 11, 12, 22, 23 and 24, and indicate the spray to be used.

SHOWING THE EFFECT OF SPRAYING APPLES



A PICTURE SERMON ON SPRAYING

Sound

Curculio Stung

Wormy

Picked fruit from one tree each where the Eastern and Western methods of spraying are applied, also that from an unsprayed tree. Top—Eastern method—four mist sprays. Middle—Western method—one-course-high-pressure application. Bottom—Not sprayed.

SPRAY CALENDAR

What To Spray	For What To Spray	With What To Spray	When To Spray				Remarks and Cautions
			First Spraying	Second Spraying	Third Spraying	Fourth Spraying	
Apple.....	For Bitter Rot, Black Rot, Bud Moth, Canker Worm, Codling Moth, Oyster-Shell Scale, Scab, San Jose Scale, Scurfy Scale, Sooty Fungus and Woolly Aphis. See Figures 30, 27, 13, 14, 8, 6, 24, 1, 2, 23, 7, respectively.						
Asparagus.....	Asparagus Beetle.....	See Figure 20.....					
	Asparagus Rust.....	Bordeaux I.....	After cutting crop.....	Ten days later.....	Ten days later.....	Ten days later.....	Repeat 3 or 4 times. Burn rusted brush in fall.
Bean.....	Anthrachnose.....	See Figure 21.....					
Beet.....	Leaf Spot.....	Bordeaux I.....	When plants are 5-6 in. high.....	Two weeks after first.....	Two weeks later.....		
Cabbage and Cauliflower..	Cabbage Worm.....	See Figure 11.....					
Celery.....	Leaf Spot or Leaf Blight..	Bordeaux I.....	On young seedlings....	Repeat on seedlings....	Before or after transplanting.....	Two weeks later.....	Keep leaves well covered in plant bed.
	Root Rot.....	Drain Soil.....					
Cherry.....	Leaf Spot.....	Bordeaux II.....	When leaves are unfolding.....	Two weeks later.....	2 or 3 weeks after second.....		First after blossoming. Often necessary to treat after crop is gathered.
	Mildew.....						Use 3 when fruit is large.
	Rot.....	Bordeaux I. and II..	Before blossoming I.....	After blossoms drop, II. on fruit.....	Two weeks later, II. on fruit.....	2 weeks later, II. or 3..	Difficult to reach Aphis. Use 1 lb. of soap to 4 gallons of water. Air slaked lime may be used.
	Aphis.....	Soap Solution.....	On first appearance of Aphis.....				Avoid strong solutions. Do not use other arsenicals than arsenate of lead.
	Cherry Slug.....	See Figure 12.....					Repeat as necessary. Repeat at weekly intervals.
	Curculio.....	Arsenate of Lead in Bordeaux I. and II.	Before blossoming in I.....	As blossoms dry up in II.....	One week later in II.....		Apply to fruit carefully.
	San Jose Scale.....	15 or 17.....	Before buds open.....				
Cucumber.....	Anthrachnose.....	Bordeaux I.....	When plants begin to vine.....	Two weeks later.....	Two weeks later.....	Two weeks later.....	
	Downy Mildew.....	Bordeaux I.....	July 25 to August 1.....	8 to 10 days later.....	8 to 9 days later.....	Eight days later.....	
	Spot on Fruit..	Bordeaux I.....	After first blossoms....	Ten days later.....	Two weeks after second.....	Two weeks after third.....	

FOR READY PREPARED SOLUTIONS SEE PAGE 13.

SPRAY CALENDAR—Continued

What To Spray	For What To Spray	With What To Spray	When To Spray				Remarks and Cautions
			First Spraying	Second Spraying	Third Spraying	Fourth Spraying	
Cucumber.....	Cucumber Beetle.....	See Figure 17.....					
Currant.....	Leaf Spot.....	See Figure 32.....					
	Plant Bug.....	Kerosene emulsion or 17.....	May.....	Early in June if necessary.....			
	San Jose Scale.....	Lime-sulphur or 17.....	As with the apple.....	In spring as with apple.....			
	Worm.....	See Figure 9.....					Look for worms on under side of leaves first
Gooseberry.....	Leaf Spot.....	Bordeaux I.....	As currants with leaf spot.....	As currants with leaf spot.....	As currants with leaf spot.....	As currants with leaf spot.....	
	Mildew.....	Bordeaux I.....	Before leaves open I.....	After blossoming I.....			
	Worm.....	White hellebore.....	As on currants.....				
Grape.....	Anthraxnose.....	Bordeaux I.....	Just before buds open.....	Just before blossoming.....	Just after fruit has set.....	10 days later Bordeaux.....	
	Berry Moth.....	Arsenate of Lead with Bordeaux I. or 5.....	Before bloom.....	After fruit has set.....	July 1 to July 15.....		
	Downy & Powdery Mildew.....	See Figure 25.....					
	Rot.....	Bordeaux I. or 5.....	Just before blossoming Bordeaux I. or 5.....	Just after fruit has set 1 or 5.....	7 or 8 days later.....	7 or 8 days later.....	5 good. Follow by two or three sprayings with Soda Bordeaux.
	Leaf Hopper.....	Kerosene emulsion or 17.....	Before young can fly.....				
Horse Chestnut.....	Leaf Spot or.....	Bordeaux I.....	When leaves are half-grown.....	Two weeks later.....	Two weeks after second.....	2 to 3 weeks later.....	
	Blight.....	Bordeaux I.....					
Muskmelon.....	Anthraxnose.....	Bordeaux I. and II.....	In seed bed or when plants begin to vine.....	2 weeks later Bord. I.....	Two weeks later.....	Two weeks later.....	Repeat as necessary; Use II. very early.
	Downy Mildew.....	Bordeaux I.....	July 25 to August 1st.....	8 to 10 days later.....	8 or 9 days later.....	Eight days later.....	
	Leaf Blight.....	Bordeaux I.....	When plants begin to vine.....	Three weeks later.....	3 weeks after second.....	Two weeks after third.....	Repeat same.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.

SPRAY CALENDAR—Continued

What To Spray	For What To Spray	With What To Spray	When To Spray				Remarks and Cautions
			First Spraying	Second Spraying	Third Spraying	Fourth Spraying	
Pea	{ Blight. { Mildew.	Bordeaux I.	Just before bloom.	Two weeks later.	Repeat if needed.		
Peach	Leaf Curl.	See Figure 36.					Cover fruit well.
	Pustular Spot. Rot.	Bordeaux II. or 6. Bordeaux I., 6 or 6-2.	Just after calyx drops. As buds are swelling 1 or 15.	Two weeks after first. Just after calyx drops 6 or Bordeaux II.	Two weeks later. 3 or 4 weeks later 6 or Bordeaux II.	As fruit begins to color 6 or Bordeaux II.	Every 7-10 days repeat. Destroy all mummies. 6 appears safest remedy. Use only half usual amount of poison.
	Scab.	Bordeaux I, 4 or 15.	As buds are swelling Bordeaux I, 4 or 15	Just after calyx drops 6 or Bordeaux II.	2 weeks later, 6 or Bordeaux II.	Repeat third.	
	Bud Moth. San Jose Scale.	Arsenites in Bord. I. See Figure 4.	With opening of buds.				
Pear	Leaf Blight.	Bordeaux I. or 5 or 3 or 6-2.	Before blossoms open.	Two weeks later, I or 5	2 weeks after second.	Bordeaux may make russet fruit.	
	Scab.	See Figure 26.					
	Bud Moth.	Arsenites in Bord. I.	With opening of buds.				
	Canker Worm. Codling Moth.	Arsenate of Lead. Arsenites in Bord I.	As with the apple.	Same as first.			See apple. See apple.
	San Jose Scale. Slug.	See Figure 22. See Figure 10.					
Plum	Pockets or. Bladders.	Bordeaux I. or Lime- sulphur.	In March, I or 15.				Treat as for leaf curl of peach.
	Rot.	See Figure 28.					
	Shot-hole Fun- gus.	Bordeaux I or 5.	When leaves are half grown.	Three weeks later.	3 weeks later if needed	Repeat.	Protect to end of season
	Curculio.	See Figure 16.					
	Aphis. San Jose Scale.	Soap solution. See Figure 3.	On appearance of aphid				Use 1 lb. soap to 6 gal. water.

FOR READY PREPARED SOLUTIONS SEE PAGE 13.

SPRAY CALENDAR—Continued

What To Spray	For What To Spray	With What To Spray	When To Spray				Remarks and Cautions
			First Spraying	Second Spraying	Third Spraying	Fourth Spraying	
Potato.....	Early Blight....	See Figure 31.....					
	Late Blight....	Bordeaux I or 5.....					
	Blister Beetle..	Whale oil soap or dilute Chloro-naptholeum.....	When beetles appear..	Repeat if necessary.....			Use 1 lb. soap to 6 gal. of water.
	Colorado Beetle	See Figure 19.....					
Quince.....	Flea Beetle....	See Figure 18.....					
	Leaf Spot.....	Bordeaux I and 5.....	When leaves are half grown.....		Two weeks later I. or 5	Two weeks later.....	First should come before blossoms open
	Fruit and Leaf Spot.....	Bordeaux I.....	Just before blossoms open.....	After blossoms drop..	Two weeks after second.....	Two weeks later.....	
Raspberry and Blackberry..	San Jose Scale.	Lime-sulphur or 17.....	In late fall or early spring.....				
	Anthracnose....	Bordeaux I. and II....	Before leaves open use I.....	II. on young canes 6	Repeat 2d, 1 week later		Keep spray from leaves on bearing canes.
	Leaf Spot.....	Bordeaux I.....	When leaves are half grown.....	Two weeks later.....	Two weeks later.....		
Strawberry....	Saw Fly.....	Pyrethrum or hellebore.....	As for currant worm..	In 3 or 4 days repeat			
	Leaf Spot.....	See Figure 35.....					
Sugar Beets....	Leaf Spot.....	Bordeaux I.....	With first appearance of spots.....	2 or 3 weeks later.....	2 or 3 weeks later.....	Three weeks later if needed.....	Use 1 lb. to 6 gallons of water.
	Blister Beetle..	Whale oil soap or dilute Chloro-naptholeum.....	When beetles appear..				
	Flea Beetle....	Bordeaux I. combined with 9.....	When beetles appear..				
Tomato.....	Anthracnose....	Bordeaux I.....	Soon after fruit begins to set.....	Three weeks later.....	Three weeks later.....		
	Leaf Blight....	See Figure 33.....					
	Point Rot.....	See Figure 29.....					
Watermelon....	Anthracnose....	Bordeaux II.....	When plants begin to vine.....	Three weeks after first.....	Three weeks later.....	Three weeks later.....	Bordeaux I., some danger.
	Downy Mildew	Bordeaux II.....	July 25 to August 1st.....	Eight to ten days later.....	Eight to nine days later		
	Leaf Blight....	Bordeaux II.....	As disease appears on muskmelons.....	As on muskmelons.....	As on muskmelons.....	As for cucumbers.....	

FOR READY PREPARED SOLUTIONS SEE PAGE 13.



THE RIGHT KIND OF SPRAYER

IN the foregoing pages we have told you of the necessity of spraying, the different formulas, and when they should be applied, but as the success of a spraying operation depends as much on the machine used as on the solutions, we would not be treating the subject thoroughly if we did not say something of the qualifications of the sprayer necessary to get the best results.

High Pressure—It is necessary to apply the solution in a fog-like spray that will penetrate every part of the foliage, settling underneath as well as on top of the leaves. A fog-like spray can be obtained only by using a high pressure sprayer that will develop 100 pounds', or more, pressure in ordinary use.

Agitation—You must use a sprayer that has thorough agitation, for if the liquid is not constantly stirred so as to keep the ingredients in solution and from settling on the bottom of the barrel or tank, a part of the solution will be too weak to do any good and the balance will be too strong and will burn the foliage. It often happens in cases where the foliage is burned that the blame is placed on the formula used, while the real trouble is due to the fact that the formula was all right but that the agitation of the sprayer was not thorough enough.

Ease of Operation—A sprayer must be easy to operate for there is no more tiresome work than operating a hard-working sprayer. The ease with which a sprayer operates depends entirely on the construction of the valves, leverage of the handle and size of the air chamber. Beware of the cheap sprayer with a small air chamber, as that is the type commonly known as the man killer.

Simplicity—A sprayer should be simple in construction so that adjustments are easily made and the sprayer not likely to get out of order and cause trouble.

Durability—The durability and satisfaction of a sprayer measures its true value. It is not the first cost of a sprayer that makes it cheap, but it is the length of time it will last and the service it will give.

Now compare the Hurst Sprayers with the above requirements. Every one of our sprayers are adapted and built to carry and develop a high pressure. The agitation developed by all of our sprayers is as near perfection as it is possible to make it. We have paid special attention to the feature of agitation as we realize that the success of spraying depends largely on the solutions being properly agitated while the spraying is being done. All of our sprayers are constructed with a large air chamber, the leverage of the handle on all of our hand sprayers is the greatest possible to obtain and our valve construction is the result of over a quarter of a century experience. **Simplicity**—there are fewer parts used in the construction of Hurst Sprayers than any other sprayer made. If you will study the construction of our sprayers carefully you will find that they are built to last and the most durable sprayers made. We guarantee our sprayers for five years, which is further evidence that they are made right.

Consider the above features carefully when deciding as to which sprayer to buy, and if you will make a careful comparison of all features, we are sure that you will decide in favor of a Hurst. Order a Hurst Sprayer and you will always be satisfied.



HURST



CANTON



HURST SPRAYERS WIN THE MEDALS

At the meeting held by the National Horticultural Congress, at Council Bluffs, Iowa, November 10th to 19th, 1910 a spraying machine contest, open to the world, was conducted. The tests were made under the auspices of the American Society of Agricultural Engineers, and was the only actual test in operation ever held in the United States. All machines entered in the contest were stock machines. The medals reproduced above were won by Hurst Sprayers in the same class, the one winning second premium taking second only to the other Hurst Sprayer winning first. The winning of these medals is significant of the quality of Hurst Sprayers. Buy a Hurst Sprayer and get the best.

HURST QUALITY SPRAYERS HURST

HURST KNAPSACK SPRAYER



Furnished in either Galvanized Steel or Copper

The Hurst Knapsack Sprayer will do better work, operate easier, and last longer than any other Knapsack Sprayer on the market. We recommend it to anyone who has spraying to do on a scale not sufficiently large to warrant the purchase of our Man Power or heavier outfits. This sprayer is adapted for spraying potatoes, young orchards, cotton, tobacco and all kinds of vegetables. It can be used for washing windows and buggies, and is especially adapted to the whitewashing of hen houses and dairy barns. In fact, it can be used with the very best of success wherever a small capacity sprayer is practical.

One of the very best features of this outfit is its extreme simplicity. There is practically nothing to get out of order about it. The valves are of the ball variety, and are accessible from the outside of the can without in any way disturbing the pump itself. This is also true of the strainer at the bottom of the pump. The plunger is made of hard wood boiled in oil to prevent decay. Instead of cup leathers that soon wear out or are eaten out by the spraying chemicals, a flannel packing wrapped around the plunger is used. Anyone can replace this packing in a few minutes and at practically no cost whatsoever. Another important feature is the cap at the side of the tank. This opens directly into the air chamber and when you are through spraying this cap can be taken off and the pump can be emptied in a few seconds of all the solution remaining in the pump. This prevents the corroding of the valves, and injury to the pump, adding years to its life. Many of these pumps have been in use for twelve years.

The Hurst is equipped with wide steel shoulder hooks, heavily padded and self adjusting. These are easier on the operator and more convenient than the old style leather shoulder straps that are continually breaking or cutting into the shoulders and arms of the operator. This is a very important matter and should be fully considered before buying a sprayer of this type.





HURST



CANTON



HURST KNAPSACK SPRAYER—Continued

The Pump, which is the base of every sprayer, is made under the Hurst Patents that have been tested and found thoroughly practical for the last 28 years. It has a large air chamber which allows it to throw a fine steady spray 15 to 20 feet. This enables the operator to do perfect work.

The Tank—After experimenting with all sizes and shapes for the tank on this outfit, we have found that the oblong shape as shown hangs easier and is most comfortable to the operator. We also find that five gallons of liquid is the most convenient capacity. The outfit is furnished either in copper or galvanized steel. Where galvanized steel is used the tank and pump are treated with acid proof enamel which will withstand the action of any spraying solution. Size of tank, 18 inches high, 12 inches long, and 5 inches wide.

The Hose used is $\frac{3}{8}$ inch, 48 inches long, 3-ply, high pressure hose of the very best quality and will last for years. A 12-inch galvanized extension rod is regularly furnished, but a 6-foot extension rod can be furnished at a small additional cost.

The Nozzle furnished is our highest grade "Maid of the Mist" Nozzle furnished with 3 discs, enabling the operator to throw a fine, medium, or coarse spray.

It will be seen from the foregoing that the same careful attention to details is apparent in this outfit as in our very largest and most expensive machines. Nothing has been omitted that would make it handier or more complete.

We invite comparison, knowing that this outfit will compare favorably with any Knapsack Sprayer made, no matter at what price it sells for.

Outfit No. 22—Galvanized steel treated, acid proof enamel, complete, price \$8.50.

Outfit No. 22A—Copper throughout, complete, price \$11.50.

If wanted with 6-foot extension rod, add 75c to above prices. Shipping weight, 18 lbs.

HURST-CANTON BUCKET SPRAYER

This pump surpasses all other bucket pumps ever made in work it will do, its ease of operation and service it will give. It is used with perfect success for spraying trees, shrubbery and gardens. Washing windows, wagons, buggies and autos. Putting out fires and for whitewashing and disinfecting hen houses. No bucket pump could possibly give better satisfaction or last longer. There are thousands of these pumps that have been in use from 12 to 15 years and are giving perfect satisfaction today. This handy device measures 24 inches high, and will fit over any pail 14 inches tall. It has a stroke of 6 inches long and develops a strong fine spray, or will throw a stream 50 feet horizontally. The hose to which the nozzle is attached is 30 inches long. It is a marvel of simplicity. All parts can be easily removed. At the extreme bottom there is an automatic mixer by which a jet of liquid is forced out into the bucket which keeps the mixture well agitated. By pulling out the plunger cap at the top you can look through the whole pump. The plunger is simple, provided with a wrapping that can be renewed in a few minutes without any cost. The body of the pump is of special coated heavy galvanized steel and cannot rust. It is also furnished in heavy copper throughout which makes it practically indestructible. At the side there is a passage called the patent overflow which allows all surplus liquid to run back into the vessel and not splash out at the top. This is very important for if chemicals get on the skin or face they will act as caustic and cause many days of discomfort. Therefore we warn you against cheaply made spray pumps which are always out of order and are dangerous to operate. For a small capacity pump for use around the home and garden this outfit has no equal. Weight when packed for shipment 6 pounds. Price, **Outfit No. 9** Pump with galvanized steel body complete with Combination Trio Nozzle, making three different sprays for all kinds of work all ready to use, \$3.00, cash in full with order. Price, **Outfit No. 9-A**, same as above except with heavy copper body throughout, \$4.25, cash in full with order. Owing to the low cost of these outfits we do not sell either of the above on our regular selling plans but for cash in full with order only. Each and every pump, however, carries our binding guarantee to do good and satisfactory work and can be returned and money refunded if not in every way satisfactory.



Bucket Sprayer
(Outfit No. 9)



QUALITY



SPRAYERS



HURST COMPRESSED AIR SPRAYERS



(Outfit No. 10)

in illustration, \$5.00.

With polished brass body, \$6.50. CASH WITH ORDER. Money refunded if not satisfactory. 6-foot Rod, 75c extra.

AS shown by the illustration this sprayer is for carrying under the arm, and can be easily used in orchard or field. It is suitable for spraying potatoes, fruit trees, vegetables, tobacco, cotton, etc. For washing wagons, windows; for putting out small fires; for whitewashing hen houses, cellars, and other places; for disinfecting, etc. When charged with liquid the sprayer weighs only about 20 pounds. It is 20 inches high, with diameter of 10 inches. It is provided with an adjustable strap to hang over shoulder. It can be used with a long handle spray rod or with short length hose. The body of the sprayer is made up of heavy polished brass or galvanized steel. The top and bottom are joined together under pressure, making air-tight and water-tight seam. This is further supported at the bottom by a heavy steel band. The air pump is made of heavy brass, two inches in diameter.

How to Work It—This is charged with air same as you would a bicycle pump. It also agitates the solution at the same time. When the correct pressure has been gained, there is a safety valve which “blows off,” showing you that there is no need of further pumping.

Prices—Outfit No. 10. With Galvanized steel body, Hose (2 feet long), Strap Carrier and Nozzle, as shown in illustration, \$5.00. With polished brass body, \$6.50. CASH WITH ORDER. Money refunded if not satisfactory. 6-foot Rod, 75c extra.

SPRAY-KING BARREL PUMP



(Outfit No. 21)

To those wishing a smaller and cheaper pump than our Fitz-All Outfit, we recommend the **Spray King**. This is a thoroughly reliable pump, made of the best materials and will do excellent work, and although it will neither develop the high pressure nor has it the large capacity of the Fitz-All, it will do as good or better work and give better satisfaction than any barrel pump of other makes that sells at anything like the price.

The Valves are of the brass ball type ground to the 1/1000 part of an inch and seated perfectly.

The Plunger is of the inside packed type with brass plunger cap and woven flax packing.

The Air Chamber is 30 inches long and 2 inches in diameter, which enables the pump to throw a strong steady spray.

Agitation—A paddle agitator is used which thoroughly agitates the solution and insures an even distribution of the chemicals through every drop of solution sprayed.

The Nozzles are our famous “Maid of the Mist” that is furnished on all our highest grade outfits and can be depended upon to do the most satisfactory work.

It will be seen from the above description that the Spray-King must not be confused with the raft of cheap and poorly constructed pumps that are on the market. It is the most efficient and durable small capacity barrel pump made.

PRICE of Barrel Pump only, no equipment, \$8.00. Shipping weight, 35 lbs. Outfit No. 21, complete with 10-ft. 3-ply hose, one “Maid of the Mist” Nozzle, price \$12.00. Shipping weight 54 lbs.



HURST

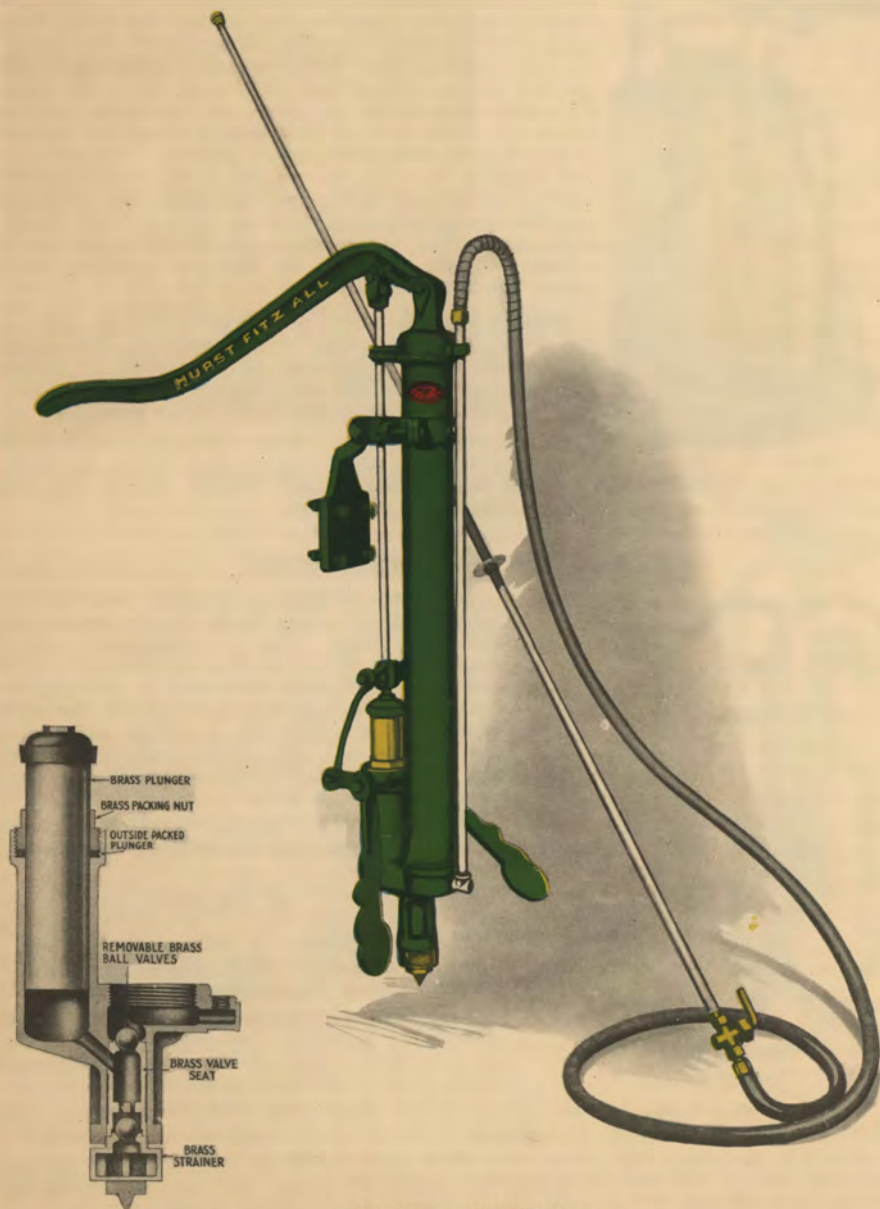


CANTON



THE HURST FITZ-ALL BARREL SPRAYER

THE BEST BARREL PUMP MADE ANYWHERE AT ANY PRICE



Plunger and Valves
There is nothing to get out of
order here

FITZ-ALL OUTFIT NO. 1

HURST FITZ-ALL BARREL SPRAYER



FITZ-ALL BARREL SPRAYER OUTFIT NO. 1-A

For Price and Equipment see Page 38

THE FITZ-ALL BARREL SPRAYER fills the demand for a large-capacity high-grade sprayer at a reasonable price. The Fitz-All, as its name implies, is so made that it can be attached to any kind of a barrel, tank or water-tight vat. The bracket which holds the pump can be moved to accommodate any height or shape or barrel. It does not require a mechanic to mount this pump.

How it is Made. In designing this sprayer we have had in mind the corrosive and deteriorating effects of many of the spraying chemicals which are being used and as brass resists these chemicals better than any other material, we have used this metal in all the working parts of the pump which come in contact with the spraying material.

High Pressure. The Fitz-All develops 200 lbs. pressure if worked to its capacity. With eighteen two-inch strokes of the handle per minute a pressure of 120 lbs. can be easily maintained. No other pump that we know of has this capacity.

Easy to Operate. Although being a high-pressure machine, it is not a man killing job to operate it, as the handle is long, giving plenty of leverage, and the valve openings are large, giving ample room for the liquid to pass through without being forced. These are very important factors to consider in purchasing a sprayer as you do not want a sprayer that pumps hard.

Plenty of Power

LA GRANDE, OREGON, April 9, 1913.

The Hurst Mfg. Co., Canton, Ohio.

Gentlemen: I have today tried the sprayer and I want to tell you that it works to perfection. I had no idea it would work so fast. It generates plenty of power from one tree to another. I cannot do anything but praise its efficiency. I am

Respectfully yours,

A. W. FOURNIER

Very Much Pleased

ORANGE, MASS., May 1, 1913.

H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: I received the sprayer all right, and used it the next day after received. I am very much pleased with it. I also thank you for the very liberal way you sent it to me.

Thanking you for all your kindness, I am

Yours respectfully,

FRED E. WHITTIER



HURST



CANTON



Agitation. The Fitz-All agitates the spraying solution more thoroughly than any other sprayer on the market. It has two swinging agitators that operate alternately at the side of the pump. As one agitator swings forward the other swings back, keeping the solution in hurried agitation and insuring the very best results. The agitators operating in this way produce much more agitation than the paddle agitators in common use which operate together. Beware of cheap wood paddle agitators which soon go to pieces and cause no end of trouble. Thorough agitation is absolutely essential to success in spraying; if the spraying chemicals are not kept in hurried agitation they will settle to the bottom of the tank or barrel and your solution will be weak at one time and do no good and so strong at another time as to burn the foliage and kill the trees.

The Nozzles furnished on all of the Fitz-All outfits are our HURST Maid of the Mist Never-Clog Nozzles. It is small in size and does not catch on the limbs or vines, making it very much more convenient than the larger nozzles. We have paid particular attention to the angle ways and proportion of this nozzle, and believe it will produce a vapor spray at a lower pressure than any other nozzle on the market. The nozzles are supplied with two steel discs with different size holes for different classes of work.

The Valves in this sprayer are brass balls ground true to the one-thousandth part of an inch and set in a brass seat that fits them perfectly, thus preventing any leakage or loss of pressure. As the pump is used the ball revolves in the seat, and if there is any wear at all the ball and seat wear perfectly uniform, in fact, the longer the pump is used the better the valves will work. They can be removed with any ordinary wrench.

The Plunger is made entirely of brass and works in a brass case. The plunger is packed on the outside, which is endorsed by all the leading authorities on spraying machines. Don't buy a cheap spray pump with the packing on the inside of the cylinder, for if you do you will soon have to buy another, as they are very short lived; for as soon as the cylinder wears the packing cannot be made to fit and they are useless. This is one of the most important parts of the pump and one that you can not afford to overlook. It costs less to manufacture a pump with inside packing, that is why all the cheap pumps are made that way. The plunger on the Fitz-All is 2 inches in diameter and 8 inches long.

The Air Chamber is 3 inches in diameter and 30 inches long. This large air capacity insures a perfect, even spray that is not affected by the stroke of the pump. It also makes the pumping easy.

White-washing. As a white-washing sprayer the Fitz-All is without an equal, as on account of the valve construction it is impossible to clog it. You can white-wash

Mist Flew Around Something Great

CEDAR RAPIDS, IA., Feb. 22, 1913.

H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: Well, I received your sprayer yesterday all O. K., and as far as I know now you don't need to see it coming back. I was anxious to see what it would do, so attached on the two double nozzles and shoved her in a barrel and went to it, and the way the mist flew around was something great. Could not hitch up the four-row attachment as I did not have fittings to rig it out so, but from the looks of the whole outfit I think it is just what I want. Best four-row attachment on the market.

Yours very truly,

H. E. & C. W. KREBS

Thoroughly Satisfied

CHARLOTTE, N. C., April 15, 1913.

H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: It gives me pleasure to say that we have been using your Fitz-All Sprayer Outfit for more than a year and we are very much pleased with it. We have found it thoroughly satisfactory in every respect. We had a large crop of peaches last year, and I think their quality was due in large measure to the spraying that we gave them. We are using it again, of course, this year.

Again assuring you of our appreciation, and with best wishes, I remain
Yours cordially,

J. A. BALDWIN,

Educational Sec., Southern Industrial Institute.

HURST QUALITY SPRAYERS HURST



FITZ-ALL BARREL SPRAYER—OUTFIT NO. 7
For Price and Equipment see Page 39

your barn, out-buildings or factory in half the time required to do it by hand with a brush and do a more thorough and better job. It pays to white-wash your buildings.

The Fitz-All One-Man Outfit No. 7, as shown here is a very handy machine, as it requires only one man to operate it. The liquid is pumped into the compression tank under air pressure and you can then go ahead and spray a tree without further pumping. The principle is about the same as the small compressed air sprayers, but instead of a small air pump our large Fitz-All Sprayer is used. You can do your spraying without help with this machine and the saving of labor alone will be more than enough to pay for it in one season.

The Fitz-All Wheel Outfit No. 2, as shown on page 38, is especially adapted for use in places where it is impossible or not desirable to use a horse, but a horse hitch can be furnished and a horse used if desired. It consists of 32- to 50-gallon oak barrel mounted on two steel wheels, 26 inches in diameter, with 3-inch tires. As this machine is so easily portable it makes a very desirable white-washing outfit.

The Fitz-All Barrel and Box Cart Outfit No. 2-A, as shown on page 39, is one of our latest and most popular outfits. It is a handy combination for the farm or orchard. The barrel can be removed and the box attached, or vice versa, in five minutes. When the box is attached the frame supporting the barrel is raised, furnishing supports for the side as well as increasing the ground clearance. The wheels are 36 inches high, have 2-inch tires, are light, strong and durable. The frame is of all-steel construction and will last a life time. If you do not have a hand-cart on your

Best I Ever Used

BLOOMINGDALE, MICH., April 8, 1913.

Hurst Mfg. Co., Canton, Ohio.

Gentlemen: There isn't any danger of your getting the spray pump back. It works like a charm and I certainly am more than pleased with it. I was a little afraid of it when I ordered it, but I certainly will recommend it wherever I can. It is the best little pump I ever used or saw used.

Wishing you the best of success, I remain

Yours respectfully,

EDWARD ROCHAREK.

Does Splendid and Efficient Work

COALVILLE, UTAH, June 25, 1913.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: This is to inform you that I received the spraying out, Fitz-All 1-A, on good time and have since then done my spraying. I like the outfit fine. It has done splendid and efficient work and is easy to understand and operate. The force is good and fills the bill entirely as a spraying outfit.

Yours very truly,

WM. J. WRIGHT.



HURST



CANTON



FITZ-ALL BARREL SPRAYER—OUTFIT NO. 2

For Price and Equipment see Page 39

farm you can not appreciate how handy an outfit of this kind really is. It saves a lot of heavy lugging—saves hitching up the team many times—will soon pay for itself.

General. From the foregoing description it will be seen that the Fitz-All Sprayer is a strictly high-grade machine and is not to be compared with the many cheap outfits called spray pumps. In buying a sprayer, as in buying anything else, it is not the first cost that indicates the cheapness, but the length of time it will last and the satisfaction the article will give that must be considered along with the price. Our ten days' trial and five-year guarantee should convince you that our machines will do the work we recommend them to do and are built to last.

LIST PRICES OF THE FITZ-ALL OUTFITS

Price of bare pump only, not including equipment named below, \$12.50. Shipping weight, 70 lbs.

Outfit No. 1, complete as shown on page 34, with 12½ feet of high pressure hose, wire wound at end, with one Hurst Never-Clog Nozzle, stop cock and 8-foot galvanized rod with drip guard, price \$16.50. Shipping weight, 80 lbs.

Outfit No. 1-A, complete as shown on page 35, with 12½ feet of high pressure hose, 8-foot galvanized rod with drip guard, stop cock, with one Hurst Never-Clog Nozzle, mounted on good second-hand 32- to 50-gallon barrel nicely painted, price \$20.60. For new barrel add \$1.00. Shipping weight, 125 lbs.

Outfit No. 1-B, same as No. 1-A, except barrel is horizontal and has two 12½-foot leads, high pressure hose, two 8-foot galvanized rods with drip guards, stop cocks, with two Hurst Never-Clog Nozzles, mounted on second-hand 32- to 50-gallon barrel, nicely painted; price \$24.65. For new barrel add \$1.00. Shipping weight, 140 lbs.

Best Nozzle Ever Saw

ROYERSFORD, PA., March 5, 1912.

The H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: The spray pump I got is all it is claimed, and a better nozzle than those I never saw; and have seen a number of them. Yours,

HARRY C. HARLEY.

A Child Can Operate It

ALMA, ARK., March 24, 1913.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: I am well pleased with the spray. I don't think any better is made. A child can operate it. Yours respectfully,

G. M. HUGHES.

HURST QUALITY SPRAYERS HURST



FITZ-ALL BARREL AND BOX CART—OUTFIT NO. 2-A
For Price and Equipment see below

Outfit No. 7, complete as shown on page 37, with 12½ feet high pressure hose, 8-foot galvanized rod with drip guard, stop cock and nozzle, mounted on new 32- to 50-gallon oak barrel with 10-gallon galvanized compression tank attached; price, \$24.80. Shipping weight, 175 lbs.

Outfit No. 2, complete as shown on page 38, with 12½ feet high pressure hose, 8-foot galvanized rod with drip guard, stop cock and nozzle, mounted on new 32- to 50-gallon oak barrel on strong 26-inch iron wheels, with 3-inch tires, price, \$25.00. Shipping weight, 200 lbs.

Outfit No. 2-A, complete as shown on page 39, with 12½ feet high pressure hose, 8-foot galvanized rod with drip guard, stop cock and nozzle, mounted on new 50-gallon oak barrel with truck and box. Price, \$29.40. Shipping weight, 300 lbs.

We can furnish hose in any desired length for 12c per ft., extra above the 12½-ft. length.

We also furnish Four-Row Attachment to be used in connection with any of the Fitz-All Outfits, complete for fastening to rear of cart or wagon, for \$5.00.

Does All You Claim

WILSONVILLE, CONN., Sept. 23, 1913.

H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: I want to say a good word for the Fitz-All Sprayer that I bought of you. I have used it and find that it does all that you claim for it. I thank you for your kindness in rendering this very great service to me.

A. H. BOULET.

It's a Dandy

KELLY'S STATION, PA., March 20, 1913.

H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: I have used sprayer on 50 apple trees, 31 plum trees, 9 quinces and 1 pear and must say it is a dandy. There are perhaps as good sprayers as yours, but don't think there could be any better. I am well pleased with yours.

Respectfully yours,

H. L. STUART.



HURST



CANTON



POWER BARREL SPRAYER—OUTFIT NO. 15
For Price and Equipment see below

This outfit is intended to be operated by a gasoline engine. It is the same in construction as our Fitz-All Sprayer described on preceding pages, with special pump jack for belting to engine. If you have an engine and want a cheap sprayer on which you can use your engine, this sprayer is what you want. The pump has plenty of capacity to handle two lines of hose under a high pressure. You will notice that it is mounted on a nice neat platform which makes it very convenient for loading on any wagon truck to which your engine may be attached. Also that the barrel is fastened in such a manner that it can easily be disconnected and operated by hand at any time you do not care to use the engine power. Thus you can have a power sprayer at a cost slightly above the cost of a hand sprayer by making use of the engine used for other farm work. The simplicity of the outfit makes it possible for any boy to operate it who can handle a gasoline engine. The outfit as shown with one 20-foot lead of high pressure hose, pressure regulator, pressure gauge, extension rod, nozzle and stop cock, with new 50-gallon oak barrel. List Price, \$32.00. If two 20-foot lines of hose are wanted instead of one, add \$5.00 to the price. Shipping weight, 200 lbs.

Certainly Fine

WINONA, MINN., April 12, 1912.
The Hurst Mfg. Co., Canton, Ohio.

Gentlemen: My sprayer is in fine working order. I gave it a thorough trial the other day, spraying my orchard and your Fitz-All Sprayer is certainly fine. Thanking you for your kind and prompt attention, I am
Yours respectfully,
ARTHUR MACEMON.

Beats Them All

ANDERSON, IND., April 30, 1913.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: Received the sprayer and am well pleased with it. Does the work fine. It beats them all.

Yours truly,

S. WELLINGTON,
Mgr. Bishop Poultry Farm.

HURST QUALITY SPRAYERS HURST



FITZ-ALL PAINTING MACHINE—OUTFIT NO. 2-B
For Price and Equipment see below

THIS Outfit was designed to meet the demand for a high-pressure painting machine for handling white-wash and cold-water paints. The old method of painting by hand with a brush requires too much time and is not thorough, as you can not get the material in the cracks and crevices. This machine places the material in a vapor spray, forcing it into every crack and crevice and doing a thorough, even job. Two men with this machine can do more and better work than ten men with the old method.

The Pump is our regular Fitz-All Sprayer shown and described on the preceding pages. It has brass ball valves that will not clog, brass plunger, strainer, packing band, etc., and is especially adapted to handling white-wash and cold-water paints.

The Barrel is a 50-gallon new oak barrel, mounted on wheels, making it easily portable. A handle for moving the machine is furnished.

The Nozzle is our regular Maid of the Mist, with special discs for handling white-wash and paints.

The Equipment consists of 12½ feet of high-pressure hose, stop cock, 8-foot galvanized extension rod with drip guard and nozzle.

The List Price of the outfit, No. 2-B, as shown above with equipment specified, is \$23.70. Shipping weight, 150 lbs.

Child's Play to Run the Machine

HAYDEN LAKE, IDAHO, April 16, 1913.
Hurst Mfg. Co., Canton, O.

Gentlemen: Am enclosing you settlement, as I understand your catalog. If this is not correct please let me know and I will do anything to make it satisfactory. Will say I am more than pleased with your sprayer. It does all you claim for it and I think a little more. It is simply child's play to run this machine.

Yours truly,
H. A. CULLER.

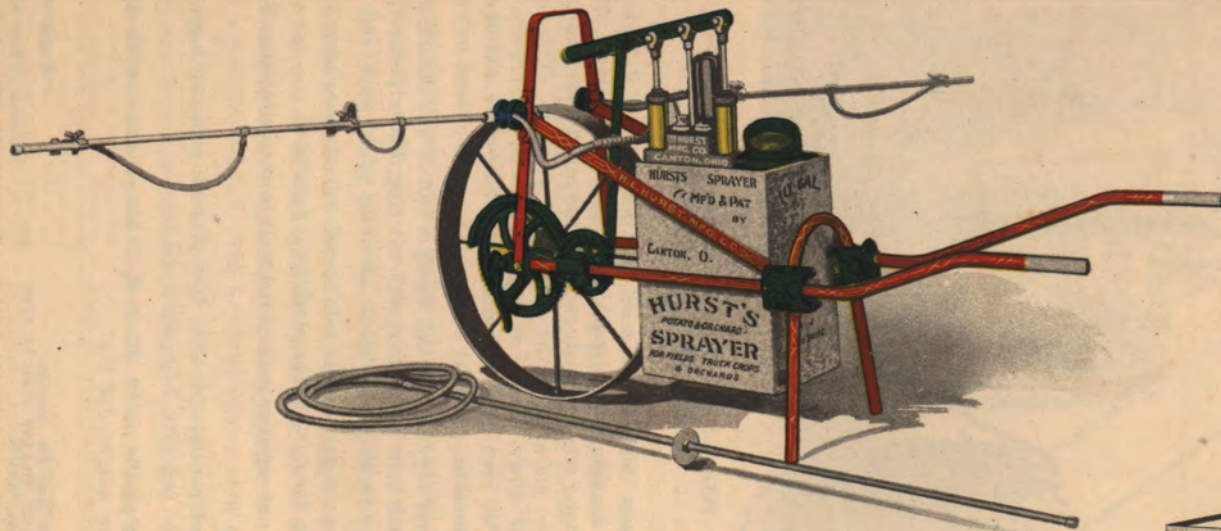
Works Fine

CREAL SPRINGS, ILL., April 27, 1912.
Hurst Mfg. Co., Canton, O.

Gentlemen: I thought I would write you a few lines. I have sprayed my orchard one time and will start over again next week. I have got a fine bloom. The Hurst Sprayer works fine. I haven't had any trouble.

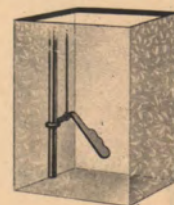
Yours truly,
G. R. GODDARD.

HURST MAN-POWER POTATO AND ORCHARD SPRAYER



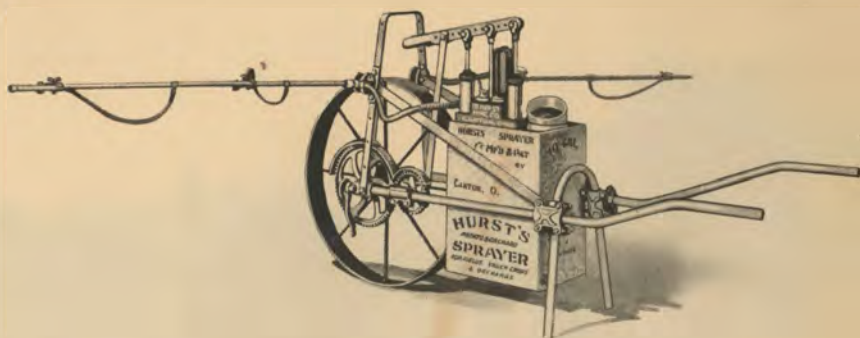
OUTFIT NO. 4

For Price and Equipment see Page 46



The Agitator

HURST QUALITY SPRAYERS HURST



MAN-POWER COMBINATION SPRAYER—OUTFIT NO. 3
For Price and Equipment see Page 46

FOR ORCHARD, POTATO, TRUCK, STRAWBERRY, ONION, CELERY AND VINEYARD SPRAYING. The handiest all-around sprayer ever invented. Over 10,000 of these machines in use in United States alone besides the large number that have been shipped to foreign countries. It is so adaptable, easily handled and simple to operate and understand and is so well made that every machine sold in a locality means the sale of many others. Its success and popularity are the natural growth of its evident proven usefulness. There is nothing about this sprayer we can say that would be exaggeration. We stand back of every one of these machines with an unqualified, steel-riveted, iron-bound guarantee. This machine is without competition as it is the only all-around hand machine made.

How It Works. For field and vineyard work this sprayer is unsurpassed. It has two long arms which spray four rows of potatoes or truck at one time. The nozzles can be adjusted to any width up to 10 feet and to any height up to 7 feet. The long arms can be adjusted to any angle for work between grape vines, berry bushes or rows of anything tall. In vineyard spraying the spray arms are set in a vertical position and the spray is directed into the vines from the side. Each spray arm is supplied with a stop cock to shut off the spray and is as adaptable to all situations as the human arms. The nozzles can be turned in any position on the spray arms. Each spray can be thrown 3 feet or more. Two sprays can be concentrated on one row or can be arranged to spray broadcast. With all this adaptability, the spray arms are simple and easy to handle, adjustments being made by means of thumb nuts.

For Orchard Spraying. You can change this machine over in five minutes and make it easily adaptable for work in the orchard. You need no tools. The spray arms

Sprayed 3,000 Trees

FAIRBURN, GA., Sept. 18, 1914.

H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: Yours of the 14th has been received and contents carefully noted. Everything is clear to my mind in regard to the Engine Power Sprayers. My Man Power Machine, which will cover 10 acres per day, is a daisy as far as it's able. You will remember I have the four row attachment to it, and also the horse attachment, but just as soon as the leaves fall from my apple trees and apples gathered I shall buy an Acme Power Machine, as I have the finest apple orchard in the state of 3,000 trees.

During season of last spring we worked the little machine to a finish, night and day, and it certainly did stand up fine for so small a machine. We run two leads of hose on it and as you have experience in spraying business you have some idea of what this machine has done, and in the three years it has been in use, have never had but one breakdown which was the threads stripped off the plunger rod. I sold my little machine today for \$25.00, after using it three years. When I began spraying three years ago I was getting about 150 or 200 bushels of apples and after carefully spraying my orchard, I have choice trees that will average 30 bushels per tree of as pretty and perfect apples as can be grown on earth.

Yours very truly,
(Signed) J. B. RAVEN.

R. F. D. No. 3.



HURST CANTON



MAN-POWER POTATO AND ORCHARD SPRAYER

For Price and Equipment see Page 46

can be removed by easily detached hand screws, and the hose and rod attached for tree spraying. This outfit makes a very desirable tree sprayer, and many of our customers are using it on large orchards. Instead of wheeling the machine around through the orchard where a great deal of work is to be done, they simply put the machine on a wagon, which is quite an advantage where large trees are to be sprayed, as the operator can then stand on the wagon, which makes it easier to reach the tops of the trees.

High Pressure. This machine produces a fine vapor spray which penetrates to every part of the foliage, insuring the very best results.

The Agitator is of the paddle type, which operates at the bottom of the tank, moving back and forth at the side of the strainer of the pump. This insures an even distribution of the spraying chemicals which is very essential to successful spraying. The agitator prevents the strainer from clogging and keeps it clean at all times.

Easy to Operate. As the machine is constructed entirely of steel and brass it is very light, and as most of the weight of the tank is carried by the wheel, it is easy to operate. Nearly every one who uses this machine finds it much easier to operate than they expected. If you should have hilly ground we can furnish a horse hitch, but most of our ten-gallon machines are sold without it.

The Tank on our No. 3 and 4 outfits is of ten-gallon capacity. The tank of No. 3-A outfit is of the twenty-gallon capacity. The tanks are made of heavy galvanized iron and are coated on the inside with an acid-proof enamel, which makes them very durable (they are covered by our five-year guarantee). The tank is supplied with a drain so that when through spraying the chemicals can be washed out and the machine drained dry.

Finest We Have Ever Seen

EVANSVILLE, IND., July 17, 1913.

The H. L. Hurst Mfg Co., Canton, O.

Gentlemen: We would not do without your Man-Power Sprayer any more. It is the finest we have ever seen in this city at present. The people that have seen your sprayer at our place think very much of it and well pleased to see it work at our place.

Yours truly,

THEODORE BUCHHOLZ.

Most Complete and Useful Implement.

CHAGRIN FALLS, OHIO, May 8, 1913.

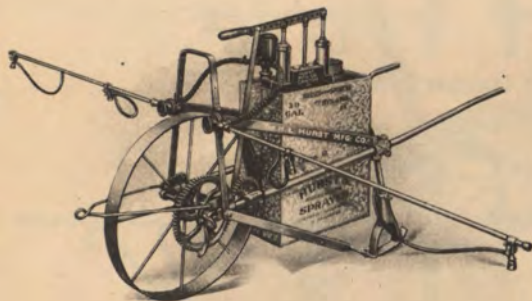
H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: Received your Man-Power Sprayer last Saturday in very good condition. It is the most complete and useful implement I ever used. I-sprayed four cherry trees last night and it certainly worked fine. I am very well satisfied with it.

Yours respectfully,

GEO. NYCAMP.

HURST QUALITY SPRAYERS HURST



20-GALLON, HORSE-POWER SPRAYER—OUTFIT NO. 3-A
For Price and Equipment see Page 46

The Pump. Our new Pump is of the duplex type, having two cylinders in which the plungers operate alternately, that is, one goes up as the other goes down. This type of pump is much more satisfactory than the single cylinder type, as it runs much smoother, has larger capacity, and generates a higher pressure. The plunger, cylinder, strainer, etc., are made of brass. There is no leather or rubber about our pumps to cause trouble. The gearing, which operates the pump, in field work is supplied with a lever so that it can be thrown in and out of gear in moving the machine to and from the orchard or field. The pump will develop one hundred pounds' pressure when worked to its capacity.

The Frame. The sprayer is mounted on a steel wheelbarrow frame. It is constructed of steel tubing, light and strong. It is rigid, well bolted together and braced, so that there is no weaving or loosening up of bolts.

The Wheel which carries the load and operates the pump in field work, is 26 inches in diameter and has 3-inch tire. It is made of steel.

The Spray Arms are made of galvanized steel tubing, light and strong. Each arm is supplied with two nozzles which can be adjusted to any position. The arms, as stated before, can be set in vertical position or at any angle. They can also be adjusted up or down on the spray arm yoke for different heights of plants.

General. The simplicity and adaptability of this machine is evident. We challenge any one to produce a machine adapted to all kinds of spraying that is so simple and easy to set up and get in motion. It does not require a mechanic to handle this machine, as any 16-year-old boy can make every adjustment. You can cover ten to twenty acres per day, four rows at a time. If you have two acres or more of fruit or potatoes, you can not afford to be without this labor-saving machine.

The No. 3-A, 20-gallon outfit with runners and horse hitch, is for those who desire a cheap horse-power machine. Owing to the ease with which it can be handled and the large capacity and low price for a horse-power machine, it has proven a very popular outfit.

All That You Claim It to Be.

SWAINTON, N. J., Oct. 7, 1914.

H. L. Hurst Mfg. Co., Canton, Ohio.

Dear Sirs: Enclosed please find money order for \$24.52. Your sprayer is all that you claim it to be and I am more than pleased with it. Could not get along without it. Thanking you for your honest dealing, I remain

Yours truly,
(Signed) HARRY HEAR.

The Acme of Perfection

GRANVILLE, N. Y., July 23, 1914.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: The Man-Power Sprayer ordered by F. J. Watt is giving perfect satisfaction. I have had considerable experience with various makes of sprayers, but in my estimation you have attained the acme of perfection in sprayer construction. Please send me a copy of your catalog and spray book.

Very respectfully yours,
(Signed) A. J. WATT.
F. J. WATT.



HURST



CANTON



FIG. 1 FOR ONION SPRAYING



FIG. 2 FOR CELERY SPRAYING

SPECIAL SPRAY ARM EQUIPMENT—See Price below

LIST PRICES OF THE MAN-POWER SPRAYERS

Outfit No. 3, as shown on page 43, with all equipment for spraying potatoes, truck, vineyards, etc., as well as small trees, price \$25.00. Horse hitch, \$1.00 extra. Shipping weight, 130 lbs.

Outfit No. 4, as shown on page 42, complete, for both field and high tree spraying, with 8-foot galvanized extension rod, 10-foot hose (the nozzles from the spray arms used in tree spraying). Price \$27.50. Horse hitch, \$1.00 extra. Shipping weight, 135 lbs.

We can furnish either Outfit No. 3 or Outfit No. 4 described above with two-row attachment for spraying truck or potatoes, instead of the regular four-row attachment, for \$3.00 less than the prices quoted above.

We can also furnish the Outfit No. 4 with the orchard attachment only, and not including any truck spraying attachment, list price \$22.00.

Outfit No. 3-A, as shown on page 45, for field spraying, with 20-gallon tank, runners for carrying tank and horse hitch, price \$33.00. Orchard attachment, \$2.00 extra. Shipping weight, 160 lbs.

Special Spray Arms for onion or celery spraying as shown above, furnished on any of the man-power sprayers instead of regular spray arms, \$2.00 extra. If wanted in addition to the regular spray arms, add \$5.00.

Profit-Making Results

BELLAIRE, OHIO, Jan. 24, 1913.

H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: The Man-Power Potato and Orchard Sprayer which I purchased from you in March, 1912, has given me nothing but profit-making results, and to show my appreciation of your prompt and thorough attention to my order, I enclose the names and addresses of some of my neighbors who are contemplating buying sprayers this season.

Yours sincerely,

WM. B. KINSEY.

Have Used Sprayer Five Years

PLAINFIELD, ILL., July 25, 1913.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: Just received your letter and am sending stamps for amount, 30c, for which I thank you ever so much. Am much pleased with your sprayer: have used it for 5 years and would not go back to the old way of spraying any more.

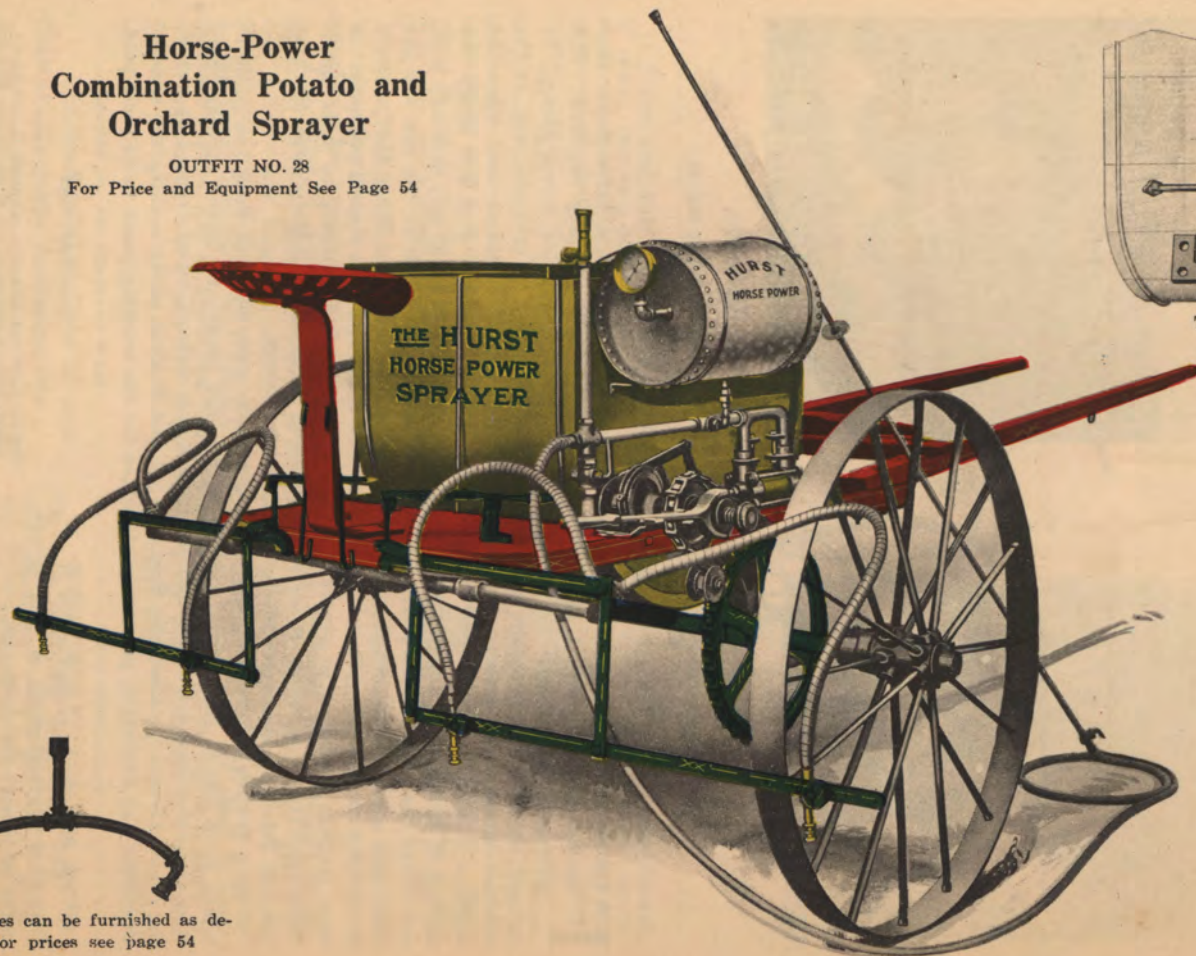
Thanking you again, I remain

Yours very truly,

CHAS. T. WINKLER.

Horse-Power Combination Potato and Orchard Sprayer

OUTFIT NO. 28
For Price and Equipment See Page 54



The Agitator



Double Nozzles can be furnished as desired. For prices see page 54



HURST



CANTON



HURST HORSE-POWER SPRAYER



HORSE-POWER POTATO AND FIELD SPRAYER—OUTFIT NO. 25

For Price and Equipment see page 54

FOR Spraying trees, potatoes, vineyards, celery, weeds, etc. A horse-power that works automatically in field and orchard. No hand pumping required. The pressure is generated by the drive wheels as the machine moves along. In orchard spraying the pressure is generated and stored in the pressure tank as the machine moves from tree to tree, and the pressure thus stored is used when the machine is standing still. For every 32 feet of drive you can stop and spray two gallons of liquid under a high pressure. This is sufficient to spray any ordinary tree, and where the trees are very large, one side is sprayed going down the row and the other side coming back, which gives you four gallons per tree. When the pressure is run up to 200 pounds, you can spray from 3 to 8 minutes with a good pressure. A hand lever is furnished to generate pressure where it is impossible to drive, as in spraying a tree in a corner or for white-washing. This Hurst Horse-Power Machine will pay for itself in one season in saving in labor alone.

How It Is Made. The foundation of a sprayer must be rigid, firm, not liable to weave from side to side. Some sprayer frames are apparently bound together very strongly, but where put into actual use in field and orchard, when exposed to corroding chemicals and the elements, they rust out and decay in parts, making the sprayer worthless—an uncertain, precarious structure for the working parts to do their part.

You Have Reason to Be Proud of It.

SOUTH LYNDEBORO, N. H., April 30, 1914.

Messrs. H. L. Hurst Co., Canton, Ohio.

Dear Sirs: A three days' trial of your Sprayer has just been finished by me. You have reason to be proud of the machine you send out, she is all you claim her to be. I can and will highly recommend your Sprayer to any man in need of such a machine.

(Signed) C. W. NELSON.

Does Fine Work

FAIRFIELD, NEBR., June 24, 1914.

The H. L. Hurst Mfg. Co., Canton, O.

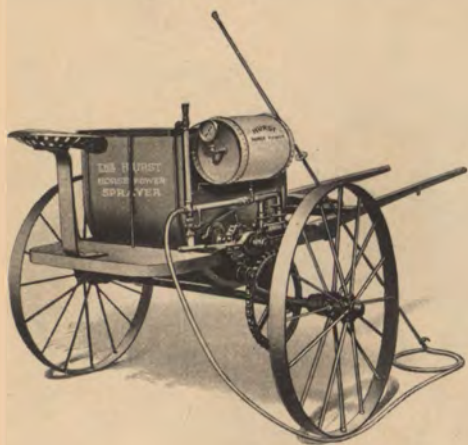
Dear Sirs: Have used the Horse-Power Sprayer No. 5 on 11 acres of potatoes and it does fine work. Has more power on pump than I expected it to have. Did not get to use it until late, had our potatoes frozen off the middle of May. Looks fine now, no bugs on them. The Hurst Sprayer is

(Signed) JOHN W. GRAY.

all right.

Yours truly,

HURST QUALITY SPRAYERS HURST



HORSE-POWER ORCHARD SPRAYER—OUTFIT NO. 26

For Price and Equipment see page 54

Frame and Axle. The Hurst Horse-Power Sprayer has a solid steel frame formed of heavy two-inch angle steel in one piece, extending around the machine—notice “one piece”—which makes it stronger than any other. This supporting frame rests on a solid cold-rolled steel axle 1 11-16 inch in diameter—the heaviest axle to be found on any sprayer. The common form of axle is made of cheap iron.

The Wheels are iron, the only suitable material for farm implements. Wood wheels soon dry out or rot out and have to be continually repaired. It's better to have dependable iron wheels at first and be free from fuss and worry. Our wheels are 44 inches high with a 3/8-inch tire 3 inches wide. They are adjustable on the axle. Each wheel is spring ratcheted so that the sprayer can be easily backed or turned in any direction. Both wheels drive the pump, developing plenty of power for any kind of work.

The Tank is made of the best cypress wood, both edges of every stave carefully fitted together snugly and tightly bound by round steel hoops, the ends of which are adjustable for tightening.

The Pump is powerful, developing 200 pounds' pressure when worked to its capacity; 70 to 90 pounds, however, is sufficient for any kind of spraying. Has 2 1/2-inch cylinder and large air-chamber surmounted with an accurate pressure gauge, directly in front of the operator. We recommend our New Single-Cylinder Double-Acting Pump because it will develop just as much pressure as the small Double-Cylinder Pumps, and is much less liable to cause trouble. Simplicity in a pump is what you want. The pump has Brass Ball Valves, Brass Plunger, and all other working parts that come in contact with the corrosive solution are brass.

Adapted to All Kinds of Work

KENNEWICK, WASH., June 16, 1913.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: Enclosed please find check for \$16.00 to pay balance due on note. Kindly return note.

Your No. 8 is a great little sprayer, simple, effective and with the foot spray attachments, adapted to all kinds of work.

Yours truly,

E. R. McCORY.

“Is a Cracker-Jack”

SPRING VALLEY, ARK., May 12, 1914.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: The Hurst Horse-Power Sprayer is a cracker-jack. I like it fine. I have sprayed with it seven days, the longer I use it the better I like it. It attracts lots of attention, nothing like it in this country. I believe it will take well with the orchard men. This is a fruit and berry country, and the land of the big red apple. I will mail you a lot of names later as the spraying season is too near done to place them this year.

Yours respectfully,

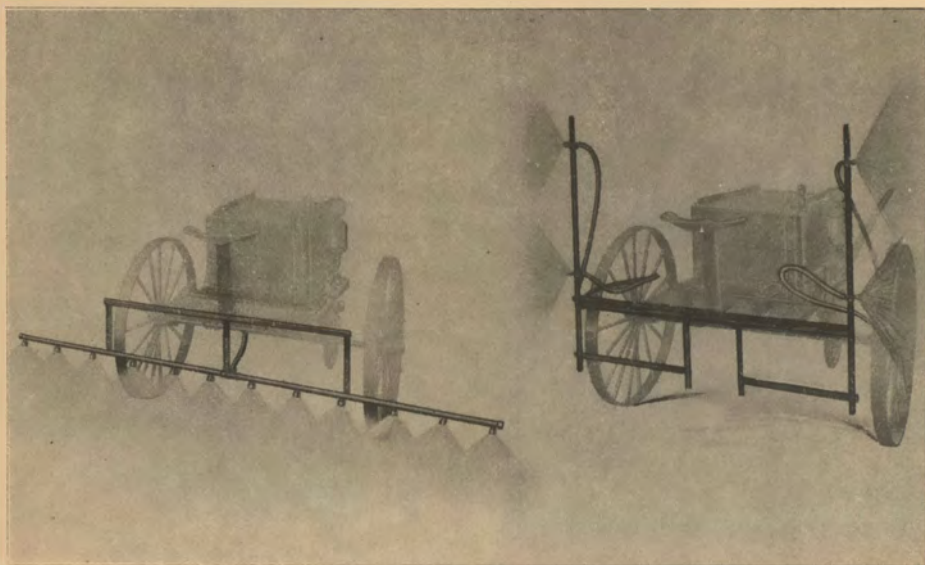
(Signed) J. N. COGER.



HURST



CANTON



VINEYARD AND BROADCAST ATTACHMENTS

The Spray Arms. These are shown at the rear of the machine with the four nozzles attached. These spray-arms are constructed of $\frac{3}{4}$ x $\frac{3}{4}$ -inch iron; strong and durable. They can be adjusted to any height of row for potatoes, truck, etc. They can be set straight up for vineyard work and fold up completely for passing through a gate or other narrow place. These spray arms can be easily and quickly removed from the machine by simply loosening two bolts. If a nozzle clogs you need not leave the seat to clean it, as the arms can be lifted right up to the seat.

For Vineyard Spraying. The spray arms are set straight up, as shown in cut, or can be set at any angle—also nozzles are adjustable to any position on the spray arms and by means of the foot treadles the operator can adjust the nozzles to or away from the row at will, as the machine moves along, which makes it the handiest sprayer made for field or vineyard work. Regular length of axle, 6 feet 3 inches, but can furnish axle 5 feet 4 inches long for vineyard work without extra charge.

The Agitator, which keeps the ingredients of the spraying mixture thoroughly agitated at all times, consists of two paddles moved back and forth by the same eccentric wheel that drives the pump piston.

The Source of Power is the steel axle. When the wheels start, the large sprocket wheel (seen on the right in cut) turns also and transmits its power through an endless chain to the small sprocket wheel on frame. This is mounted on the end of a shaft. On the farther end of this shaft an eccentric wheel is forged. This eccentric works like the pitman on an engine, is positive in its action, uniform in stroke. This

Others Are Delighted

VALLEY FALLS, N. Y., Feb. 13, 1911.

The H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: It seems to me that the outlook is good for selling some sprayers in this section. Every one who has used or seen it in operation was delighted with the Horse-Power Sprayer that I purchased from you last season. I figure that it paid for itself in my orchard alone just about three times over.

Yours truly,

GEORGE GIFFORD.

All Think It Fine

HILLSBORO, N. D., Feb. 5, 1912.

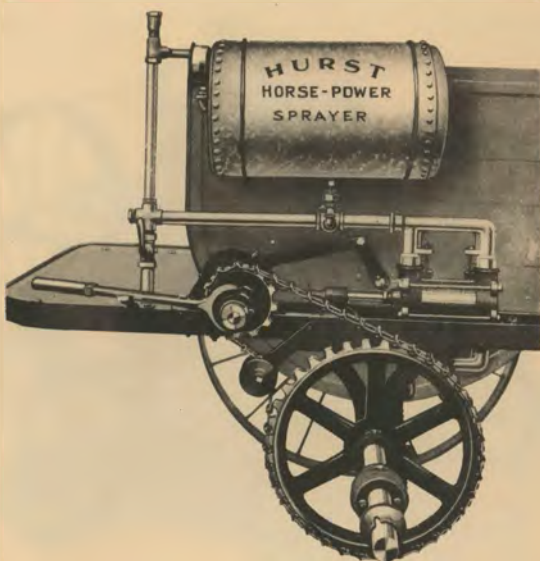
The H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: The sprayer arrived Jan. 31 and I have set it up and it is the best-looking sprayer that I ever saw. It looks good and I have had lots of farmers here to look at it and they all think it is fine. I will send you the names or some farmers later on that I think will buy a sprayer.

Yours truly,

C. F. OTTO.

HURST QUALITY SPRAYERS HURST



VIEW OF PUMP

is the strongest possible mechanical arrangement. This pump has no leather or rubber packing, nor cup-leathers; but it is packed with woven hemp packing, which, when worn out, can be easily replaced by anyone. This pump is mechanically perfect in every detail, yet is so simple and thoroughly efficient, that it would be difficult to improve it.

The Nozzles. These are attached to the four-spray tubes that connect with the supply-pipe which runs from the pump. The nozzles are the Hurst Improved Never-Clog design. They can be moved by means of thumb-nuts on the spray-arms, either left or right, and directed at any angle. The nozzles can be adjusted and directed at each row as the machine moves along by two balanced foot treadles, which move the spray-arms. Thus the operator covers every little irregularity of the rows and does not miss a lot of plants, as in the case of most sprayers. You do not have to leave the seat to make any of the adjustments. Remember, you can spray four or six rows at one time.

The Pipes and Fittings are galvanized inside and outside and are, therefore, not affected by the spraying chemicals. Beware of sprayers with black iron pipe and fittings, as they soon rust out and after one season's use the particles of rust will clog the nozzles making it almost impossible to use the machine. Brass pipes cost more money than galvanized, but are no better, therefore we do not recommend them,

No Break-Down in Four Years

CINCINNATI, O., May 16, 1912.

Gentlemen: I am pleased to give you a report of my experience with your No. 6 Horse-Power Sprayer for the past four seasons. I have about 2,000 pear trees on my place and spray three times each season. During the four seasons we at no time were obliged to discontinue spraying on account of a break-down. I am certainly pleased with your machine. Truly yours,
CHARLES F. DROSTE.

Sprayed About 2,000 Trees

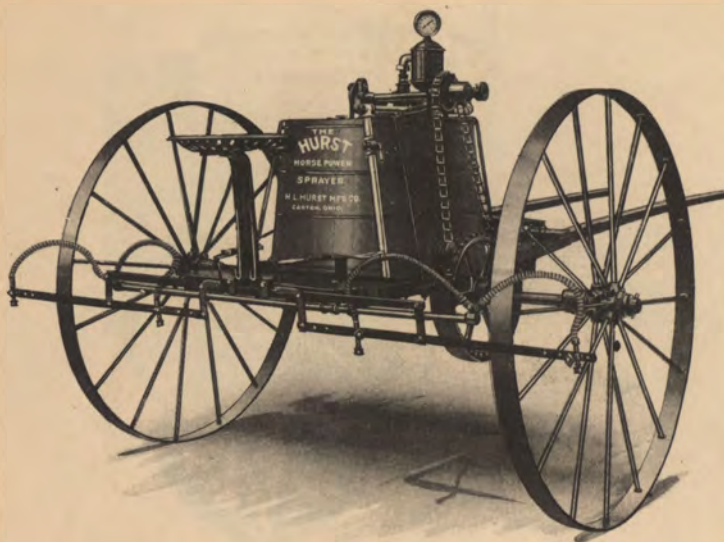
PLYMOUTH, WIS., June 10, 1913.

H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: The sprayer works good. I was taken sick soon after the sprayer was set up, so did not get a chance at it until after the blossoms fell. Since I have had so many jobs of spraying I have neglected to write; even to have that picture taken. Another fellow and myself have sprayed about 2,000 trees. Yours truly,
E. L. CHAPIN.



HURST CANTON



SPECIAL COTTON AND TOBACCO SPRAYER—OUTFIT NO. 5-A

For Price and Equipment see page 54

but can furnish them if wanted. The best steel, iron and brass castings are used throughout and the machine is well painted and nicely striped. Weight, about 700 pounds.

Spray Solution Strainer. An opening in the top of the tank 8 in. by 10 in. is provided with a fine, brass, removable sieve-strainer, through which all mixtures are to be filtered. A tight cover prevents slopping out of contents of tank when machine is moving.

Seat and Rear Platform. The whole machine is evenly balanced, so that the operator can stand with ease on platform or top of tank, and spray with pleasure and comfort. Can furnish angle iron frame to elevate operator as high as desired for any special work, at extra cost. The seat is comfortable and made of metal, as well as its support. The shafts or pole (if used for two horses on hilly ground) are made of well-seasoned timber suitable for the purpose.

No Waste of Mixture. The supply pipe is provided with a shut-off valve easily reached by the operator. With this he can shut off the spray in an instant, so as to save chemicals in turning at the end of rows or in stopping. The pressure is automatically retained at the same time, so that there is no need to drive several rods to again get up pressure. The hose leading from the supply pipe is best quality—high pressure—wound with wire.

Best I Have Seen

HOLLEY, N. Y., April 18, 1911.

Gentlemen: I have tried the one-horse-power Sprayer that I got of you some time ago, and find it to be all that you claim it to be. I am well satisfied. It comes up to my idea of a sprayer the best of any I have seen. I am sending you a few more names of parties who, I think, will be interested. I remain Yours respectfully,

W. G. COOPER.

Does Perfect and Rapid Work

PELLESTON, MICH., May 29, 1912.

Gentlemen: I received sprayer outfit No. 8 in due time, but have not written before as I did not give it a thorough trial until now, and I am glad to say it is all anyone could wish for, as it does perfect work and at a rapid rate. I am enclosing freight bill. Hoping my delay is not too disappointing, I am

Respectfully yours,

G. N. BENNETT.



QUALITY

SPRAYERS



HORSE-POWER BARREL SPRAYER FOR FIELD AND ORCHARD—OUTFIT NO. 14
For Price and Equipment see page 54

This Combination Field and Orchard Sprayer was brought out by us to fill the demand for a cheap horse sprayer. The pump used is our regular Fitz-All, shown and described on the following pages. In field work the pump is operated automatically, no hand pumping required. In orchard spraying, the pump is operated by hand just as any ordinary barrel sprayer. The field attachment is removed when the outfit is used as an orchard sprayer. It will carry a pressure of 150 pounds in either field or orchard work. We especially recommend this machine for the use of the average farmer or orchardist. Its work will please the most exacting.

Special Cotton and Tobacco Sprayer. We have had a great many calls for a special sprayer for cotton and tobacco, as there had been no machine on the market that had axle clearance enough for this work, and to meet this demand we placed this machine on the market, and it has met with significant success as it meets the need perfectly. The design of this machine is different from our other Horse-power Sprayers having the round tank with pump mounted on top and 60-inch wheels are used and the frame is set down on the axle, which gives an axle clearance of 2½ feet without increasing the height of the machine. The sprocket wheel has a shield over it to protect the leaves of the plants. This is the only machine of large capacity made for fighting the cotton boll weevil and the tobacco worm, and will save many times the cost of itself in labor alone in one season, to say nothing about the extra profit to be derived from thorough spraying. A trial of the machine will convince anyone of its value for this work. The spray arms can be adjusted to a height of 4 feet.

MONTAGUE, MICH., Jan. 28, 1914.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: About two years ago I purchased one of your Horse-Power Spraying Machines, and I want to say that I think your machine cannot be beat, as I find that I am able to do as much work alone with it as two men can do with a power sprayer of the same gallon capacity and do it much more easily on account of the unmatched simplicity of your machine. In fact I would use no other and though there are gas

engine sprayers in this territory which cost three or four times as much as yours, I have not seen one yet that I would trade my "Hurst Sprayer" for. People through the neighborhood say that I tire them to death with my praise of Hurst Machines, and I guess I do, but it is so simple, so efficient and so thoroughly reliable in every way that a man can hardly help enthusing over it. Wishing you continued success and prosperity, I remain. Your satisfied customer,

(Signed) H. C. PILGRIM,
R. F. D. No. 4.



HURST CANTON



LIST PRICES OF THE HORSE POWER OUTFITS

Outfit No. 25, complete as shown on page 48, with all equipment for potato or any kind of field spraying, with 60-gallon tank, pole or shafts, and pressure gauge. Price, \$84.25. Shipping weight, 900 lbs.

Outfit No. 5-A, complete as shown on page 52, with all attachments for cotton and tobacco spraying, with pressure gauge. Price, \$89.00. Shipping weight, 900 lbs.

Outfit No. 26, complete as shown on page 49, with all attachments for orchard spraying, with 60-gallon tank, pole or shafts, 15 feet high-pressure hose, 8-foot galvanized extension rod, one nozzle, and pressure gauge. Price, \$84.25. Shipping weight, 900 lbs.

Outfit No. 28, complete as shown on page 47, with all attachments for field and orchard work, with pressure gauge. Price, \$99.00. Shipping weight, 900 lbs.

Outfit No. 14, complete as shown on page 53, with 15 feet of high pressure hose, rod and nozzle for orchard work, and with complete field attachment for 4 rows, stop cock, pressure regulator, etc., with new 50-gallon oak barrel. List price, \$56.00. Shipping weight, 600 lbs.

Extras. If 100-gallon tank is desired instead of 60-gallon, add \$10.00 to the above prices. For all-brass pipes and fittings instead of galvanized iron, add \$10.00. If 6-row attachment for spraying field crops is desired, instead of 4 rows, add \$5.00 to above prices. For broadcast, add \$6.00 extra.

Orchard Attachment for Outfit No. 5 includes large compression tank, 15 feet high-pressure hose, 8-foot galvanized extension rod, stop cock, and nozzle. Price, \$12.00.

Potato Attachment for field work for Outfit No. 6 includes 4-row spray arms, with hose and nozzles complete, 1 1/4-inch brass stop cock, and all necessary pipes and connections to attach to machine. Price, \$12.00.

These attachments can be secured at any time as they are easily attached to the machine.

Double Nozzles, as shown at lower left-hand corner of page 47, can be attached to all Horse Power machines instead of single nozzles as shown, at an extra cost of \$5.00 for set of four.

Prompt Delivery of Repairs

KALKASKA, MICH., May 19, 1913.

Hurst Mfg. Co., Canton, Ohio.

Gentlemen: I wish to thank you for your very prompt delivery of repairs for sprayer. They were here in plenty of time for work on third spraying. Am more than satisfied with Outfit No. 8.

Yours very truly,

REED B. MEHANN.

Grew Finest Peaches

NORMANDY, TENN., March 11, 1913.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Gentlemen: By using your Sprayer and Scale-cide, I grew the finest peaches ever seen in this section. Sprayer is splendid.

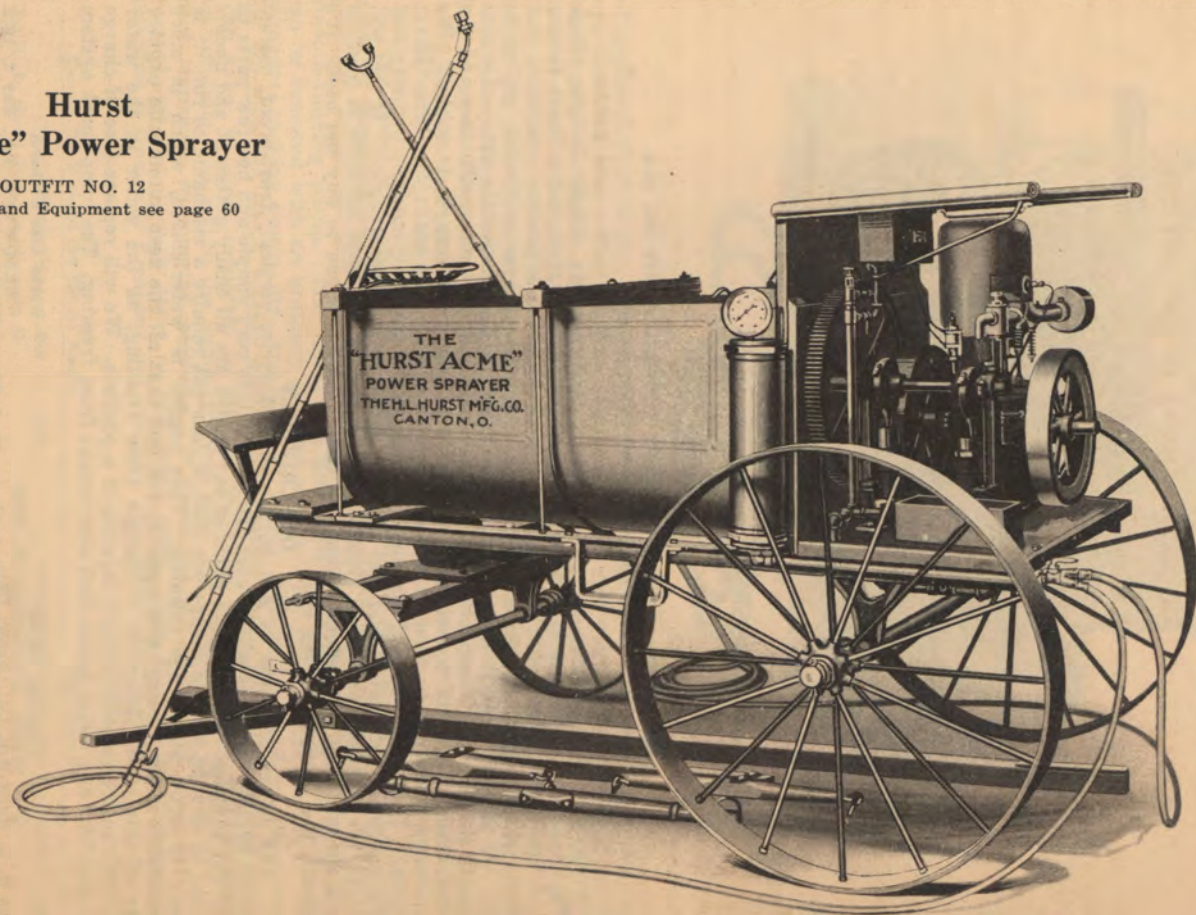
Yours very truly,

E. S. HUFFMAN.

Hurst "Acme" Power Sprayer

OUTFIT NO. 12

For Price and Equipment see page 60

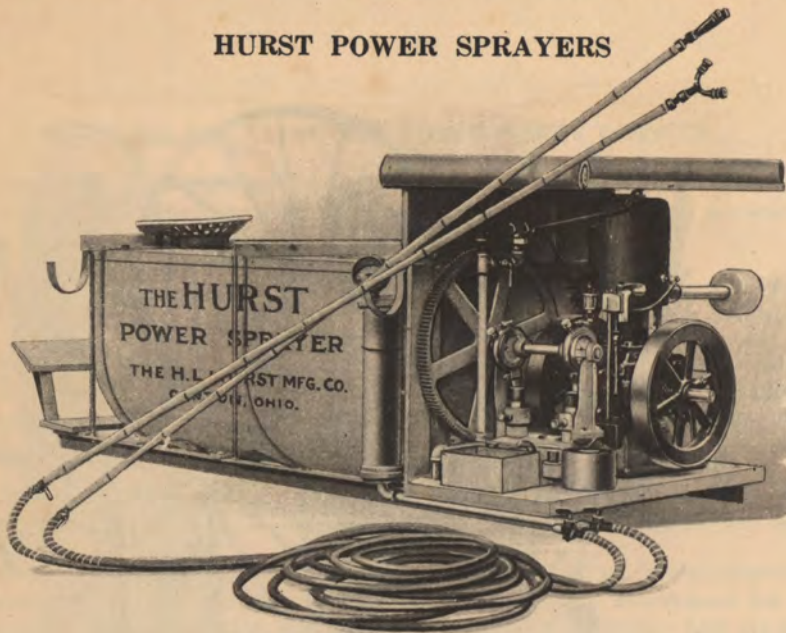




HURST CANTON



HURST POWER SPRAYERS



ACME POWER SPRAYER WITHOUT TRUCKS—OUTFIT NO. 12-A

For Price and Equipment see page 60

SPECIAL Features—Short Turn Gear, Large Capacity, Light Weight, High Pressure, Automatic Pressure Regulator, Cyclone Agitation, and a Never-failing Engine. Our first aim in designing this machine was to produce a machine that would give complete satisfaction even under the most adverse conditions, and to do this we realized that it must be made of the very best materials obtainable and simply constructed. Simplicity in a sprayer means durability and efficiency and the elimination of a lot of trouble to which the average power sprayer is subject. We challenge the world to produce a simpler and more efficient outfit than the "Hurst Acme." It is the product of the master minds in the spraying machine industry and represents the very latest and best ideas of power sprayer construction. If you will follow the detailed description closely you will see why it costs us more to produce this sprayer than the ordinary kind and that it will pay you to buy the best. It's always the cheapest in the end.

DESCRIPTION

The source of power is a 3 horse-power, 4 cycle, vertical, frost-proof, water-cooled engine, which, as will be seen from the cut, is very simple and has few parts to get out of order. The working parts of our engine are all easily gotten at and understood by anyone and we assure you that it does not require a mechanic to run it; is easy to start and keeps running. This engine is water-cooled, which is much preferable to air cooling, evidenced by the fact that all the best automobile engines are of this type. There is no danger from freezing, as the water in the water jacket can freeze solid without injuring it a particle. We will replace free of charge at any time any water jacket that ever breaks from freezing. The jump spark system

"Like Perpetual Motion"

ST. JOSEPH, MICH., Nov. 25, 1914.

The H. L. Hurst Mfg. Co., Canton, Ohio.

Dear Sirs: After testing out the Hurst Acme Power Sprayer I received of you last July, I will say it works like perpetual motion and is gaining friends wherever seen in action. Your "Ski-Hi" Nozzle is a dandy. The entire outfit is making some of the popular sprayers in this vicinity look like hand sprayers. I am,

Yours respectfully,

(Signed) CARL SCHMIDT.

Works Like a Charm

GLADWYNE, PA., May 2, 1912.

H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: Enclosed please find my check to cover amount due, less the freight on the sprayer. Owing to the high winds and a very rainy month I was unable to try out the sprayer until this present week. I find it works like a charm so am perfectly satisfied that it will do all you claim.

Yours truly,

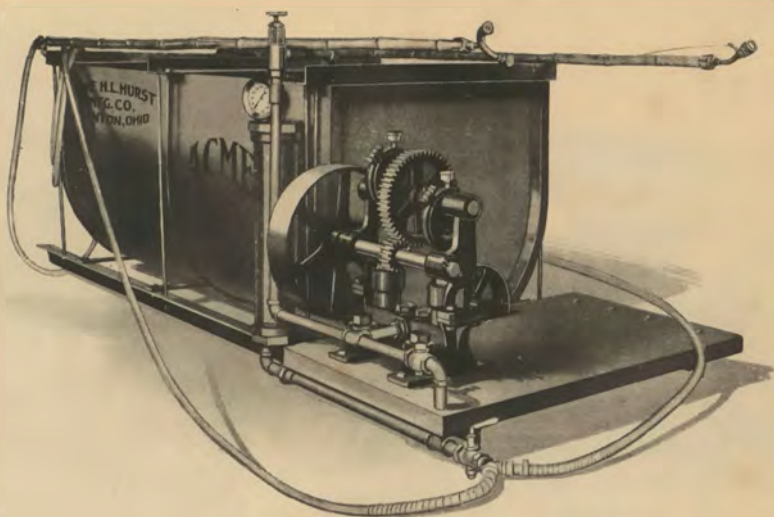
JOSEPH M. BALTZ



QUALITY



SPRAYERS



OUTFIT NO. 12-C

For Price and Equipment see page 60

of ignition (which is also used on all automobile engines) is used as it is the simplest and most reliable. The gasoline consumption of this engine, when worked to its capacity, is about two gallons per day of 10 hours. A cheap power sprayer must have a cheap engine on it or it cannot be made cheaply, and as the engine is the life of the sprayer, you cannot afford to be troubled with a poor engine. Our engine is built right and will give continued good service and is guaranteed for five years. The engine and pump are protected by roof and curtains when the machine is in use. The engine can be removed from the sprayer by simply loosening four bolts and be used for general farm work. This is quite an advantage to many and a point that should not be overlooked. See cut and description, page 64.

The Pump is of the duplex type with outside packed plungers, which is recognized by those experienced in the use of sprayers as the only satisfactory method of packing. Brass ball and con-shaped valves of large size are used, which insures a smooth-running pump. The valves are accessible from the top of the pump and can be removed with an ordinary monkey wrench. No special tools required. The plungers, packing bands, etc., are made of brass. The gears which run the pump are machine cut, which further adds to the smooth running qualities of the outfit. The pump is direct connected to the engine, which eliminates any loss of power transmission and makes the pumping plant neat and compact, and in line with the most approved engineering methods. If chain or belt instead of gear drive is desired, we can furnish same at the same price. The capacity at 200 pounds' pressure is from 5 to 6 gallons per minute. (See detail cut, page 61.)

Cannot Do Without the Ski-Hi Nozzle

UHRICHSVILLE, O., May 13, 1913.

The H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: Have tested the Pony Acme Sprayer and can say its works fine. Sprayed full grown apple trees, 30 feet high or more. Could reach them nicely with your Ski-Hi Nozzle. When tightening up the Ski-Hi Nozzle I bursted the threads that screw on the Nozzle Stem. As I cannot do without this nozzle, will you please send another and charge to my account, and oblige

J. T. WRIGHT.

Well Pleased

FAYETTEVILLE, TENN., March 7, 1913.

H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: Received pump base today. Also received your check for \$10.00 as premium for best picture of Acme Power Sprayer in operation. Please accept my thanks for the \$10.00. I certainly appreciate it. People are just beginning to study spraying in this section. Think by another season you can sell some of your spraying machines in this territory. Yours very truly,

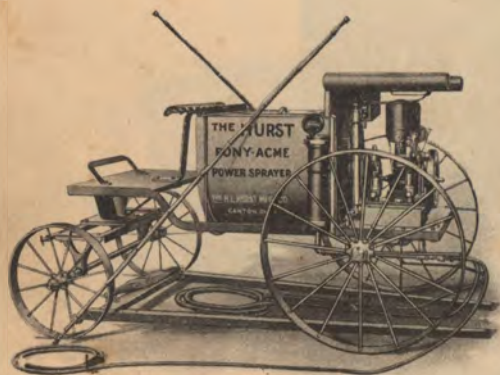
H. E. TOWRY.



HURST



CANTON



PONY ACME POWER SPRAYERS—OUTFIT NO. 12-B

For Price and Equipment see page 60

The Pressure Regulating Device is of our own construction, can be adjusted to carry any desired pressure from 10 to 250 pounds. The demand for a pressure regulating device that would not be affected by the corrosive elements in the spraying solution, and that would relieve the engine and pump of all straining when the nozzles were shut off thereby affecting a great saving in fuel consumption and wear on the whole outfit, has been met in our new pressure cut-off regulator. The spring on this regulator is placed on the outside and does not come in contact with the spray solution, and will last indefinitely. There are no valve seats to wear out and cause trouble. It is needless to say that the old style valve that makes your engine work just as hard and consume the same amount of fuel when the nozzles are shut off as when in use, with its many other objections and troubles, is a thing of the past and not in line with up-to-date methods.

The Tank is of 200-gallon capacity and is made of 1½-inch clear cypress with adjustable half-hoops and is supplied with large strainer for straining the spraying solution. The quality of this tank is of the very best, as only absolutely clear cypress, free from sap and knots, is used. The ordinary spray tank is made from No. 2 cypress and always has some sap and knots, and whenever there is sap the wood soon decays and the tank is worthless. This is another place where quality costs a little more, but is cheapest in the end.

The Tank Filler is of the ejector type, and is furnished with 15 feet 1¼-inch suction hose. It will fill the tank in from 10 to 15 minutes.

The Agitator is of the propeller type, having three propeller blades, which revolve at the rate of 350 revolutions per minute, which fairly boils the solution, insuring an even distribution of the spraying chemicals. The rod or shaft which operates

Better Than Represented

NILES, MICH., April 21, 1913.

H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: Have received sprayer in good order and did not want to write till I tried it out. I gave it a good test and I found it to be better than represented, and I would not part with it for any amount of money if I could not get another one like it. It works fine in every way.

Yours truly,

JOHN PRZYBURZ.

Your Engine or Pump Never Failed Us

SAN ACACIA, N. MEX., Aug. 11, 1913.

H. L. Hurst Mfg. Co., Canton, O.

Gentlemen: After the season's work of spraying has been finished, I wish to express to you my highest appreciation of the excellent work done by your Power Sprayer under all conditions in our orchards. Your engine or pump never failed us. We generally worked with two hundred pounds' pressure.

Yours very truly,

PHILIP ZIMMER.

HURST QUALITY SPRAYERS HURST



PONY ACME POWER SPRAYER, SHOWING VINEYARD ATTACHMENT—OUTFIT NO. 12-D
For Price and Equipment see page 60

the propeller blades is made of cold rolled steel and is direct-connected to the gear that drives the pump by means of a machine-cut gear. Beware of chain-driven agitators, that are unreliable and cause no end of trouble.

The Frame is all-steel construction, which is light, strong and durable; the two side beams, which act as a coupling, being steel, not only makes a substantial coupling and tank support, but one that will be everlasting. Beware of wood frames which soon rot out and weaken the machine.

The Gear is of the short turn type, which makes the machine very convenient, as it can be turned around in a very small space. This sprayer can be turned in less space than any sprayer on the market.

The Wheels are made of steel and will last a lifetime.

General. The construction throughout is the very best that expert knowledge and long experience can suggest. Great care is used in the selection of the material for our iron and brass castings and we use only the best steel that money can buy, thus assuring you that our machine will not only do the work when it is new, but that it has lasting qualities, and will continue to do good work for years to come. The machine complete weighs about 1,600 pounds, and two ordinary horses can handle it with ease. It is nicely painted and striped and has the appearance of the quality of machine it is. Our price is not the lowest, but when you consider the quality of the machine you will find that it is the cheapest sprayer on the market. Our 5-year guarantee fully protects you. Read it! You can't get it on any other sprayer. There is a reason for it. Take no chances, but order the Hurst and you will always be satisfied.

Runs As Steady As a Clock

MARSHALLTOWN, IA., July 23, 1913.

Hurst Mfg. Co., Canton, O.

Gentlemen: During the past season I have used one of your Acme Power Sprayers, in taking care of forty acres of peaches with splendid success. We had some engine trouble in the beginning, on account of the engine being knocked out of adjust-

ment in shipping, but after getting it readjusted it has been running as steady as a clock, giving all the power and pressure needed and doing the work thoroughly in every way. Ten acres of this orchard was so hilly and rocky that I did not believe any gasoline power sprayer could be made to operate on it, but it has covered it four times in splendid shape.

Yours very truly,
A. B. HOOVER.



HURST



CANTON



HURST ACME POWER SPRAYER IN OPERATION

The Pony Acme, for one-horse or hilly orchard work, is of the same general construction as our large Acme Sprayer, only the tank is of the 100-gallon size. As the center of gravity of this machine is very low, it is especially adapted for hillside work. We also recommend this machine for park use.

The Hurst-Canton Power Vineyard Sprayer shown on page 59 is the same as our Outfit No. 12-B with 100-gallon tank, except that it is equipped with spray arms for vineyard work with three nozzles on each side as shown. This makes an Ideal Vineyard Sprayer as it has a short turn truck, making it easy to turn at end of rows, is light in weight, and has high rear wheels making the draft easy. One good sized horse can handle it with ease. Develops 200 pounds' pressure with all nozzles on. Width, 4 ft. 5 in.

The Hurst Acme without trucks, shown on page 56, is the same as our regular Acme Sprayer only without trucks. This outfit can be put on your farm wagon or trucks and makes a very desirable, low-priced outfit.

LIST PRICES OF THE HURST ACME SPRAYERS

Outfit No. 12, as shown on page 55, complete with two 25-foot leads of high pressure hose, two 8-foot bamboo rods with one Ski-Hi Nozzle (shown on page 62), and one regular double Maid of the Mist Nozzle, pressure gauge, solution strainer, tank filler and suction hose. Price, \$300.00. Shipping weight, 1,950 pounds.

Outfit No. 12-A, shown on page 56, with same equipment as Outfit No. 12. Price, \$260.00. Shipping weight, 1,340 pounds.

Outfit No. 12-C, shown on page 57, is recommended to all who wish an outfit on which they can use their own engine. Any gasoline engine ranging from 1½ to 5 horse power can be used with perfect success. In ordering, be sure to advise the speed of your engine and diameter of pulley. Price, complete with equipment as on No. 12 Outfit, \$165.00. Shipping weight, 900 pounds.

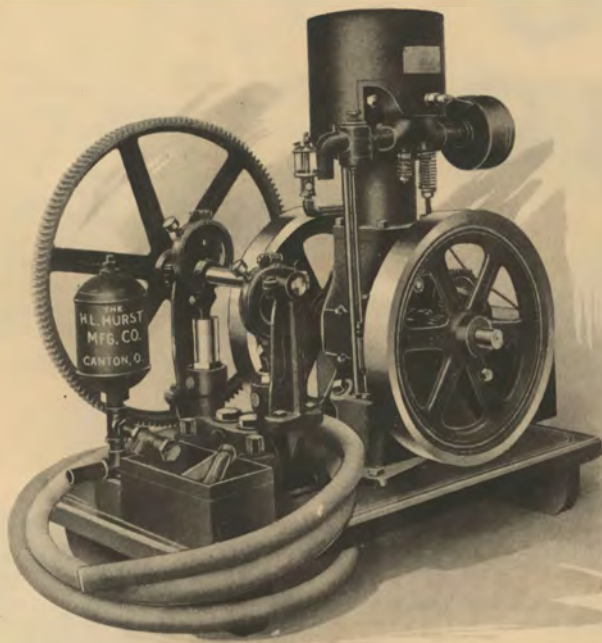
Pony Outfit No. 12-B, with same equipment as No. 12, with pole or shafts. Price, \$277.00. Shipping weight, 1,500 pounds.

Outfit No. 12-D, complete with spray arms for vineyard use, 100-gallon tank, 1¼ Horse Power Sultan Engine, price \$250.00. With Hurst Greyhound 3 Horse Power Engine, \$272.00. Orchard spraying attachment consisting of two 25-foot leads of hose, two bamboo rods, stop cocks, and nozzles, \$15.00 extra.

We can furnish the Outfit No. 12-B, as shown on page 58, with 1¼ H. P. Sultan Engine, which is very similar to the Greyhound Engine. Price, \$255.00.

Collapsible Steel Tower, as shown on page 62, \$12.00 extra.

ACME POWER PUMPING OUTFIT NO. 16

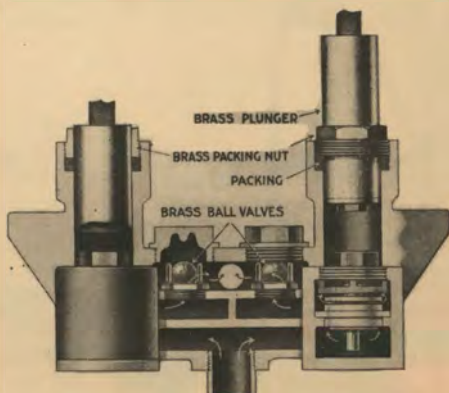


For price and equipment see below

This outfit is adapted to be used for spraying, as a pumping plant for water pressure systems or anywhere where a high-class pumping outfit is needed. As will be seen by the cross section cut below, the pump is of the duplex type (same as used on our power sprayers), has outside packed plungers, brass ball and poppet valves. The valves are easily removed with any ordinary wrench. The capacity of the pump when operating at its normal speed is from 5 to 6 gallons per minute. The outfit will carry any pressure up to 250 pounds.

The Engine is our regular Hurst Greyhound 3-horse power engine, shown and described on page 64.

List Price for the outfit complete as shown with 15 ft. wire inserted suction hose, pressure regulator, pressure gauge, etc., \$138.00. With 1½ H. P. Sultan Engine instead of the 3 H. P. and with same equipment, \$115.00. Shipping weight, 500 lbs.





HURST

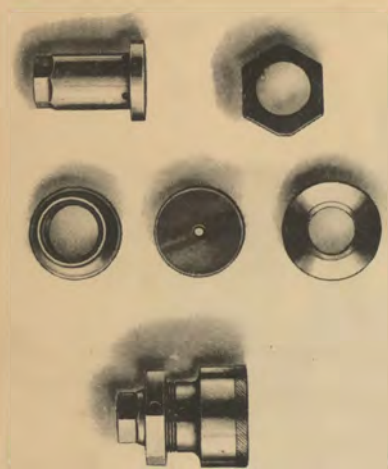


CANTON



SKI-HI VARIABLE NOZZLE

THE HURST SKI-HI VARIABLE NOZZLE is different from any other variable or high-low nozzle on the market, as it has no springs to get out of order and no movable discs to corrode and stick to render it useless. When spraying in its normal position, it throws a wide-spreading or bell-shape spray and will handle as much solution as two ordinary nozzles, thereby doing thorough work and covering ground fast. By means of a hand lever located right at the hand of the operator, the spray can be changed to a long, narrow, penetrating spray, as shown in the spraying scene at the right. The spray can be thrown 25 feet or more from the end of the nozzle, thus eliminating the need of a spraying tower, and saving many steps as it is unnecessary to walk around the tree to reach a limb extending far out on the other side, as the nozzle can be adjusted instantly to throw the spray to it.

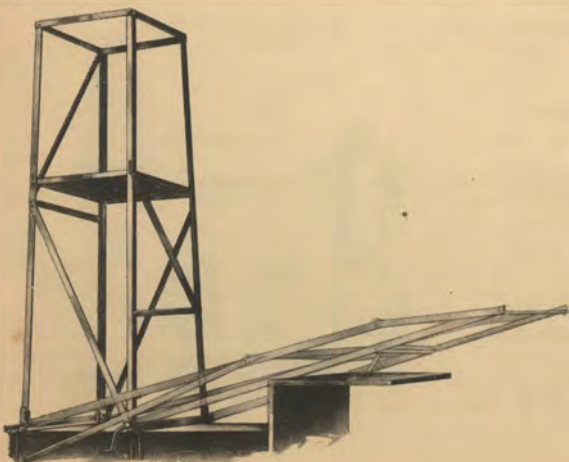


HOW IT IS MADE. The cut at the upper left hand corner shows the nozzle, also the parts, from which it will be seen that the nozzle is very simple in construction and not likely to get out of order. The spray is changed by the cap being moved to and away from the body of the nozzle, thereby eliminating the need of a movable disc, and saving lots of trouble.

NET PRICE. Nozzle as shown with lever to attach to any bamboo or iron spray rod, price \$3.00.

Nozzle with 8-foot bamboo pole, complete, net price, \$4.75.

SPRAYING TOWER. The spraying tower shown here is a very handy affair, as it can be collapsed as shown in the cut for passing under low-spreading trees or for housing. It is made of angle and flat steel, very light and easy to handle. We can furnish this tower on any of our Horse-Power or Acme Outfits for an additional cost of \$12.00.

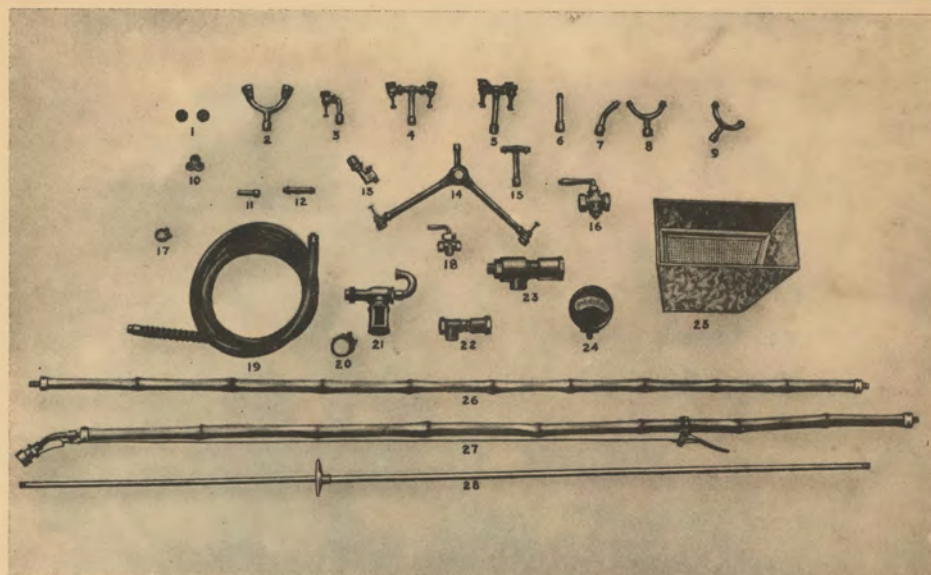




QUALITY



SPRAYERS



SPRAYING ACCESSORIES NET PRICES

	Price
No. 1 Steel Discs for Maid of the Mist or Ski-Hi Nozzles, each.....	\$0.03
No. 2 Double "Y" Nozzle, each.....	1.50
No. 3 Single Vermorel Nozzle, each.....	.75
No. 4 Double Vermorel Nozzle, each.....	1.50
No. 5 Four Cluster Vermorel Nozzle, each.....	3.00
No. 6 Nozzle Stem, each.....	.25
No. 7 45° Nozzle Ell or Bent Attachment, each.....	.25
No. 8 Straight "Y" each.....	.40
No. 9 45° Angle "Y" each.....	.45
No. 10 Trio Nozzle for Bucket Pump, each.....	.15
No. 11 1/4" Female Hose Connection, each.....	.10
No. 12 1/4" Male Hose Connection, each.....	.10
No. 13 Compressed Air Sprayer Nozzle, each.....	1.75
No. 14 Double Adjustable Nozzle, each.....	3.00
No. 15 Straight Tee, each.....	.40
No. 16 1/2" or 3/4" Cut Off Cock, each.....	1.25
No. 17 Screw Hose Clamps, each.....	.10
No. 18 1/4" Leakless Cut Off Cock, each.....	.75
No. 19 Spray Hose in 12 1/2-ft. lengths or more, with couplings, 3/8" Molded High-Pressure, per ft. .14	
Spray Hose in 10-ft. lengths or more, with couplings, 3/8", three-ply, per foot.....	.08
No. 20 Screw Hose Clamps, each.....	.18
No. 21 Ejector Tank Filler, each.....	4.00
No. 22 Horse-Power Relief Valve, each.....	1.50
No. 23 Power Sprayer Relief Valve, each.....	2.50
No. 24 Pressure Gauge, each.....	2.00
No. 25 Galvanized Strainer with Brass Wire Cloth, 30 Mesh, each.....	2.00
No. 26 8 ft. Bamboo Rod, each.....	1.75
No. 27 8 ft. Bamboo Rod with Ski-Hi Nozzle, complete, each.....	4.75
No. 28 8 ft. Galvanized Iron Rod with drip guard, each.....	1.00



"Maid of the Mist"

The Hurst "Maid of the Mist" Never-Clog Nozzle is the best all around Spray Nozzle on the market. Is small in size and does not catch on the limbs or vines, which makes it much handier than the large nozzles—produces a fine, vapor-like spray. It is furnished with two steel discs with different size holes for different classes of work. This nozzle is furnished on all Hurst Sprayers unless the Vermorel Nozzle, shown above, is wanted. You can have your choice, but the "Maid of the Mist," shown here, is the leader of them all. Net Price, 75c each.



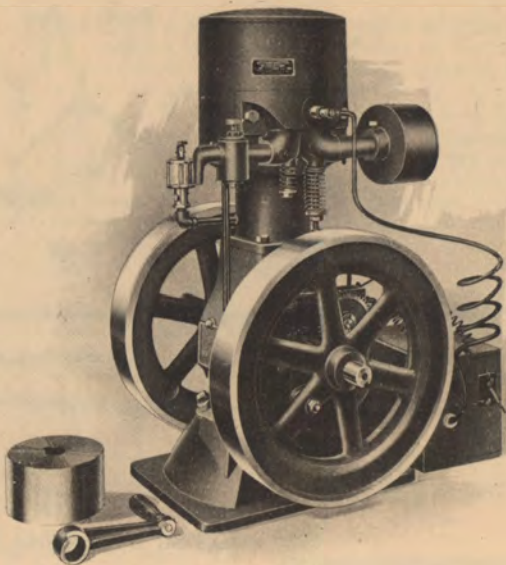
HURST CANTON



THE HURST GREYHOUND GASOLINE ENGINE

Water Cooled,
Frost Proof,
4-Cycle Engine that
always runs

Five-year Guarantee
10 days' free trial



DESCRIPTION

IGNITION. Jump spark. This system of ignition is recognized by all authorities on gasoline engines as the best. No complicated parts to get out of order. The fact that all high class automobiles use this system proves its value.

CARBURETOR OR AIR MIXER. The carburetor is of our own special design and is the result of years of experience. As the quantity of fuel consumed and the power generated depend almost entirely on the proper mixing of the gasoline and air, it is very essential to have a good carburetor. A poor carburetor makes an otherwise good engine a mighty expensive investment. Our carburetor is made right— $1\frac{1}{2}$ gallons of gasoline runs our 3-horse power engine 10 hours.

GOVERNOR is automatic—hit and miss—reducing the consumption of fuel and electricity to a minimum.

SPEED can be easily changed while the engine is running, from 250 to 600 revolutions per minute.

COOLING SYSTEM. While we use water for cooling this engine, which is the best absorbent of heat known, we do not use the cumbersome water-cooling tank or radiator. The hopper jacket which holds sufficient water to keep the engine cool for one-half day is so made that freezing of the water in the jacket does not hurt it in the least. We will replace free of charge any water jacket that breaks from any cause at any time. The engine is as neat and compact as any air-cooled engine. No fan—no damage from freezing.

THE OILING SYSTEM is perfect. Crank shaft and connecting rod bearings oiled by the splash system. Cylinder and piston by an automatic sight feed oiler.

VALVES—The valves are located in a separate casting attached to the engine cylinder, by means of two cap screws. The valve box can be easily and quickly taken off, making the valves easily accessible for grinding. No valve cage to warp and lose compression. They are of the poppet type.

GENERAL. The Hurst Greyhound is a high class engine, right in every particular. Pistons, cylinders and piston rings ground true to the one-thousandth part of an inch. The bearings are large and well babitted with the highest grade of babbitt metal. All parts that are subject to hard wear are hardened. The piston is extra long and is fitted with three piston rings perfectly ground, insuring good compression and great power. Few working parts—all easily accessible.

Bore of Cylinder..... $4\frac{3}{4}$ in.

Stroke of Piston.....5 in.

Diameter of Fly Wheel.....18 in.

Size of Pulley..... $6\frac{3}{4}$ in. Dia. 4 in. Face

Height Over All.....35 in.

Space Occupied.....18 in. x 25 in.

Speed.....425 Revolutions per Min.

Net Weight.....390 pounds

Fuel Capacity..... $1\frac{1}{2}$ gallons

Horse Power.....3

Friction clutch can be furnished for \$10.00 extra.

Magneto can be furnished for \$10.00 extra.

Back geared pumping jack will be furnished for \$5.00 extra. Each engine is complete with coil, box of four batteries, spark plug, crank, wrenches, can cylinder oil, and wired ready to run. Complete instructions for operating are sent with each engine.

We recommend this engine for operating power pumps of all kinds, cream separators, cement mixers, feed grinders, ensilage cutters, huskers and shredders, in fact for all purposes where a 3-horse power engine can be used. List price, Outfit No. 17 as shown, \$97.00. Shipping weight, 450 lbs.

Water Supply Systems

All country homes should be equipped with a water supply system. We manufacture complete systems and can furnish the best that money can buy. Write for our catalogue.

Overhead Irrigating Systems

Insure your truck crops against drouth next summer. Nothing will pay you bigger returns for your investment.

We can furnish you just what you need. Let us send you our latest catalogue.



"As ye spray, so shall ye reap"



SPRAYERS

Anything you want to know—write
us. We'll cheerfully answer you.

THE H. L. HURST MFG. CO.
CANTON, OHIO, U. S. A.

