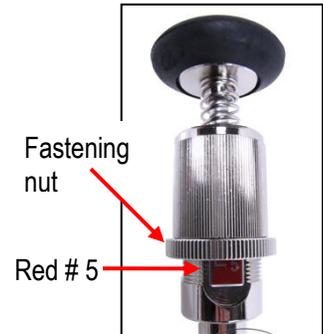


# Maintaining, Testing & Adjusting a Kioritz Soil Injector

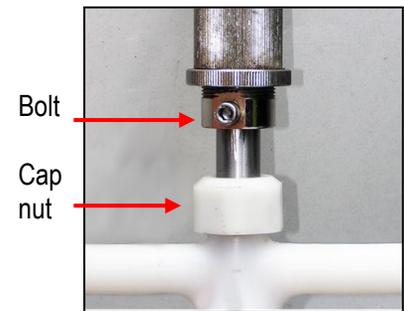
**Important:** Kioritz soil injectors are no longer made, and most of the replacement parts are no longer available. So if you have one or borrow one, take good care of it. At present, there is no equivalent one-piece replacement device. However, SGH does have the capability to repair Kioritz soil injectors in most cases. Call the Hemlock Help Line 706-429-8010 for more information.

## Inspection before each use

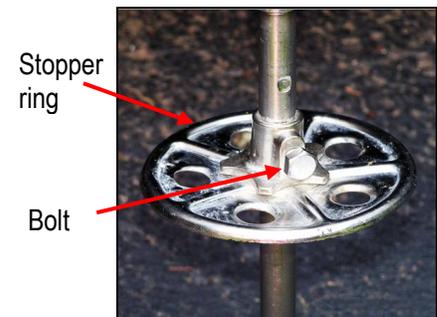
1. The bottom of the gridded fastening nut (calibration ring) of the knob seat should be set so that it bisects the red number 5, and the fastening nut is tight and secure. This setting governs the amount of liquid dispensed by each pump of the handle, which in this case should be 5 cc of fluid so that six pumps will dispense 30 cc or 1 fluid ounce.



2. The metal bolt below the calibration ring should be tight.
3. The white plastic cap nut at the top of the tank should be tight.



4. The metal stopper ring should be rounded-side-up and positioned 5 inches above the probe tip, usually the lowest indented position on the shaft. Note that this is not a “foot step” but governs the depth to which the injector probe penetrates.
5. The metal bolt that holds the stopper ring in place should be tight. Remove any dirt or debris from the stopper area.



6. Unscrew the black plastic fill cap and be sure the filter/strainer is inside and undamaged.

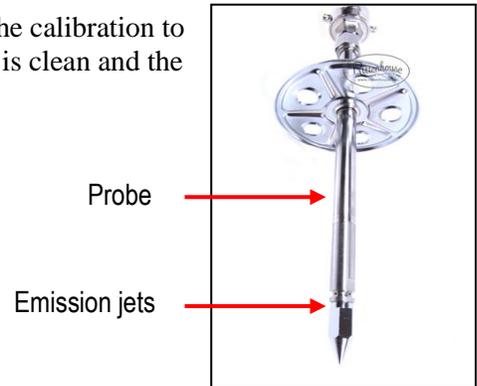


7. Before replacing the cap and filter, look inside the tank to see if there's a crack in the metal tube. If you see even the smallest crack, the injector needs to be scheduled for repair.



## Calibration testing before each use

1. Even if you can't see a crack in the long metal tube, you should test the calibration to see if the injector is dispensing properly. First be sure the probe area is clean and the four emission jets are open.



2. Pour a cup of plain water into the tank and pump the handle several times to see if water is ejected equally in all four directions. It should shoot out about 10 feet in each direction. If one or more of the emission jets is clogged, clean it gently with a sharp metal tool such as a gimlet, ice pick, or metal paper clip. It should go through the tip from one side to the other. Once you've cleaned the holes, retest the injector to be sure it's shooting water out equally in all four directions.
3. Next, to see if the injector is dispensing the correct amount of fluid, put the tip of the probe into a heavy duty measuring cup that shows ounces. Pumping the handle 12 times should yield exactly 2 ounces of fluid. If you get less, try screwing the calibration ring down lower and repeat the test. If you screw the calibration ring down as far as it will go and you still don't get exactly 2 ounces from 12 pumps, the injector should be scheduled for repair.
4. When you've completed the above testing, pump any remaining water out of the tank.

## Using the injector properly

1. Mix the treatment product in a clean container according to instructions on the [Resources](#) page of our web site. Most treatment products dissolve better in warm water than in cold. Be sure the treatment material is completely dissolved before pouring it into the injector.
2. To fill the tank, push the injector probe into the ground under a hemlock tree so the injector is at about a 45° angle with the black fill cap facing straight up. Unscrew the cap, clean the filter if necessary, and replace it loosely so the air seal is broken and liquid can flow freely through the filter into the tank. Optionally, you can use a funnel and medium grid paint filter instead of the small injector filter. Pour the liquid slowly into the reservoir.
3. When finished filling, tap the filter down and screw the fill cap on.
4. Begin the application process immediately.
5. To dispense the treatment solution, place the palm of your hand on the handle and without lifting your hand from the handle, pump firmly and quickly.
6. Don't use the metal stopper ring as a "foot step." It will break. Instead, use your upper body strength to push the probe into the ground. Avoid roots and rocks. If you feel resistance in the soil, move the probe an inch or two and try again.
7. Keep using the injector continuously until the reservoir is empty. If the injector remains motionless for more than about 10 minutes while there is treatment material in the reservoir, particulate matter may fall out of suspension and clog the injector, especially if you're using a powdered formulation.



8. If fluid begins to run freely from the tip when you're not pumping the handle, it may be because dirt has adhered to the ball valve or the spring has become misshapen inside the probe. Try to correct the problem by pumping the handle smartly one or two times to try to dislodge any dirt or debris in the probe. If that doesn't work, disassemble the part of the probe that is immediately above the tip. Do this **very carefully** over a light colored towel in some controlled space (preferably not out in the woods). In some models, the ball valve is spring-loaded and can pop out and get lost.
9. Clean the ball valve and the inside of the probe; reshape the spring if necessary or possible; or you may need to replace the ball valve or spring from your spare parts kit. Then reassemble.

**Caution: If you're not SURE what you're doing with injector repair, STOP and call the Hemlock Help Line for advice or referral to a local Facilitator who is familiar with the repair process and has the appropriate tools. This is by far preferable to damaging the injector or parts that can't be replaced.**

### **Cleaning and storing the injector**

1. **Clean the injector immediately after each use.** If there is treatment solution left in the tank when you're finished, pour it or inject it under a hemlock. Don't pour it into a stream or down a drain. Mixed solution doesn't keep well.
2. Put a couple cups of plain water into the tank, shake the injector vigorously in all directions to wash the solution from all parts (including the handle area), and pump the water through until the emission runs clear. You should do this at least three times. Be sure that water is shooting out from the emission jets equally in all four directions.
3. Remove any dirt or debris from the injector, dry it, and store it **upside down** in a clean dry place where it will not freeze in the winter.

**If you have any questions about the testing procedures above, need help in diagnosing an injector malfunction, or need instructions on the cleaning and proper maintenance of a Kioritz soil injector, please refer to "Maintaining a Kioritz Soil Injector" on the Resources page of our web site or call the Hemlock Help Line 706-429-8010.**

The appendices that follow contain the following:

- Appendix A Spare Parts Kit for Kioritz Soil Injector
- Appendix B Kioritz Soil Injector Instruction Booklet

## Appendix A – Spare Parts Kit for Kioritz Soil Injector

These are the standard spare parts that originally came in the spare parts kit for the Kioritz soil injector and are the ones that most frequently need replacing. The kit is no longer available for purchase, but SGH may be able to help you find appropriate substitute parts or arrange for your injector to be repaired by a skilled engineer.

|      |                 |
|------|-----------------|
| 2-9  | Packing         |
| 2-20 | Piston Ring (3) |
| 2-21 | Ball Valve      |
| 3-1  | O Ring          |
| 3-10 | Ball Valve      |
| 3-11 | Spring          |



**WARNING: The Kioritz injector was originally made in Japan, and all its parts are metric. Do not try to make your own substitutions with non-metric parts without first checking with the Hemlock Help Line for the specifications.**

**KIORITZ HAND SOIL INJECTOR**  
**MODEL HF-4B**  
**HANDLING MANUAL**



**KIORITZ CORPORATION**

Study this manual closely before using this injector.

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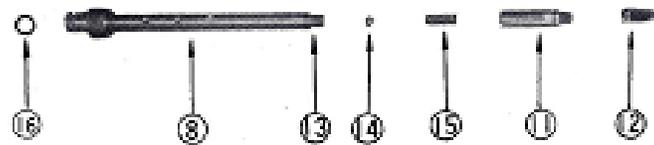
### (I) FEATURES

1. This injector can be used to inject chloropicrine as well as D. D. and EDB.
2. Exact quantity of insecticide can be injected.
3. The semitransparent plastic tank permits to observe the content from the outside.
4. The injecting quantity can be adjusted easily of the various kinds of insecticide to the minute extent.
5. It is simple and handy for handling.
6. Its structure is simple and strong.
7. As the insecticide has a nature to corrode materials strongly, a special anticorrosive material is selected as constructive components of all its parts.

- 1) Knocking knob
- 2) Knocking knob reversing spring
- 3) Knob seat
- 4) Fastening nut of knob seat
- 5) Inlet of insecticide
- 6) Insecticide tank
- 7) Fixing nut of tank
- 8) Injecting pipe
- 9) Fastening screw
- 10) Adjusting disk
- 11) Injecting nozzle
- 12) Cap
- 13) Valve seat
- 14) Ball valve
- 15) Valve spring
- 16) O Ring



**FIG. 2**



## (II) SPECIFICATIONS AND CAPACITIES

|   |                             |
|---|-----------------------------|
| Gross weight                              | 2.5kg                       |
| Height × width                            | 115cm × 27cm                |
| Capacity of insecticide tank              | 3 ℓ                         |
| Range of adjustment of injecting quantity | 1 - 5cc. for each stroke    |
| Range of adjustment of injecting depth    | 12cm, 15cm, 18cm. and 21cm. |

## (III) HOW TO USE THIS INJECTOR

1. Pour the necessary quantity of insecticide into the tank using a proper container.

2. Adjustment of injecting quantity.

When the injecting quantity is decided, set the bottom line of the fastening nut of the knob seat to the required graduation and fasten it turning the knob seat clockwise.

(The graduation of injecting quantity of one stroke is divided into five gradations of 1 cc. to 5 cc., but such minute adjustment as 1.8 cc. - 2.7 cc. - 3.6 cc. is possible also.)

3. Adjustment of injecting depth.

The injecting pipe has grooves at the each depth of 12 cm., 15 cm., 18 cm. and 21 cm. and the adjusting disk can be fixed at any required position.

4. Injecting operation.

Hold the handle and thrust the injecting pipe into the ground up to the depth of the adjusting disk. Then knock the knob quickly like striking it.

(Knocking speed will not be like prolonged one, two "itchi", "ni", but like shortened one, two "itchi", "ni".

Note: When the injecting quantity of each stroke is adjusted, there will be some error according to the kind of insecticide. Accordingly, it is desirable to measure the exact quantity

with a proper container to assure a correct and efficient injection.

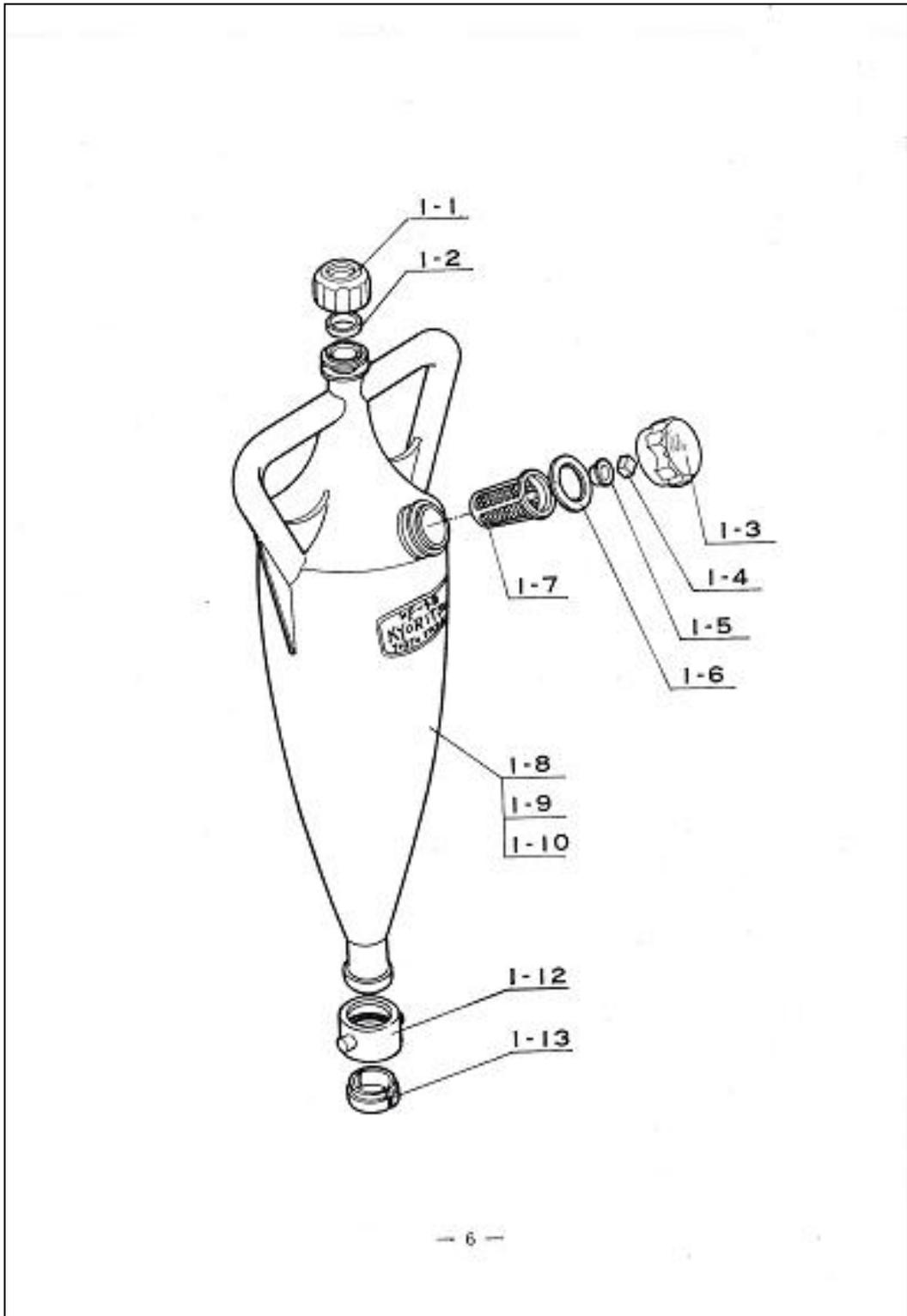
#### **(IV) CAUTION ON THE USE**

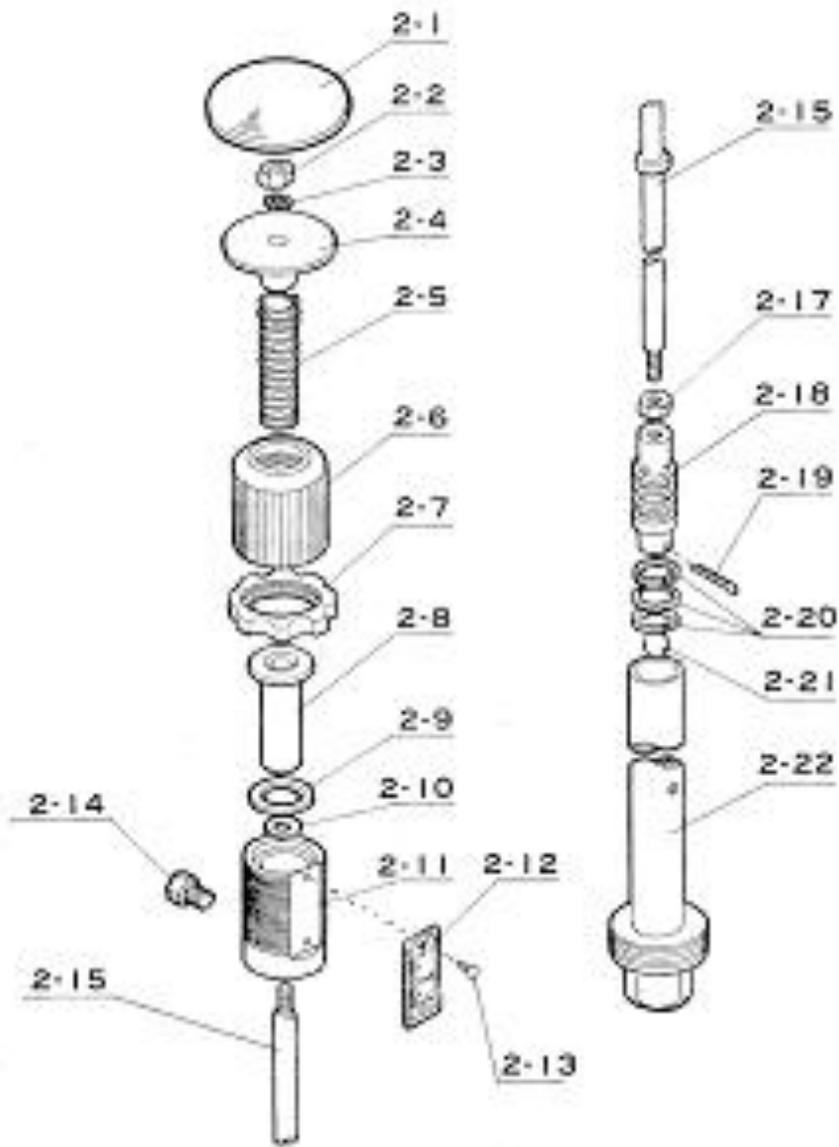
1. The abnormal leakage from the injecting nozzle is usually caused by the dust, etc., adhered to the ball valve. So, in such case, clean it keeping the following caution strictly in mind. (See FIG. 2)
  - a) When the nozzle is unfastened, ball valve and valve spring will be found inside the pipe. So, be careful not to lose them on disassembling the nozzle to clean them.
  - b) Be careful not to hurt the valve seat and ball valve. If they are hurt, the leakage will not stop even if the dust is removed. So special attention is required in cleaning.

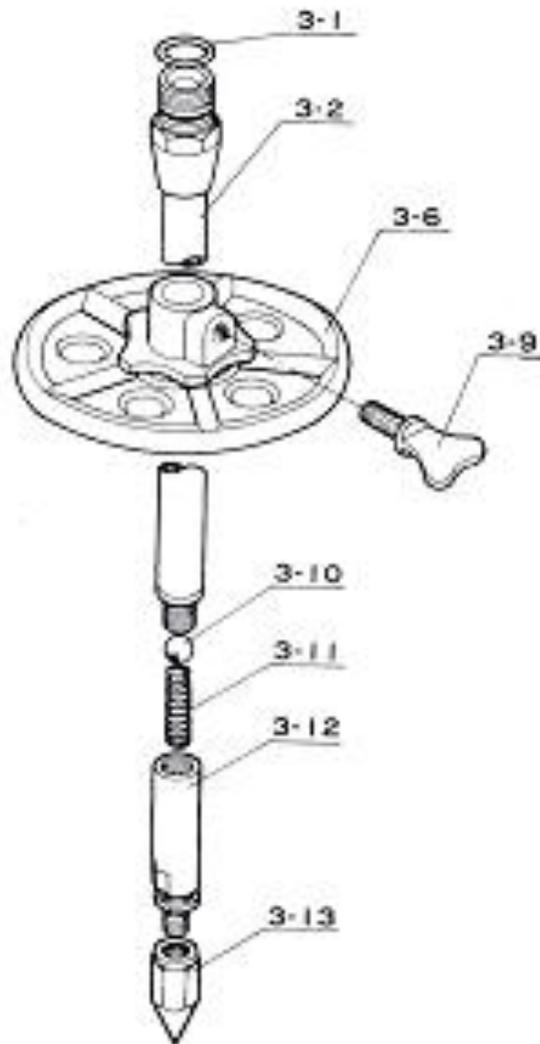
#### **(V) CLEANING AFTER THE USE**

1. After the use, empty the tank and pipe completely of the insecticide.
2. Wash the tank by shaking it with petroleum poured in the tank. Also wash the pipe knocking the knob. In case of chloropicrine, as it is strongly corrosive, wash the inside of the tank with the attached cleanser for chloropicrine, resolving one package of it with one litre of water and shaking the tank as well as knocking the knob to wash the pipe.
3. To keep it for a long time without using it, wash it well inside and outside with petroleum. Then keep it in a place as dry as possible, with the tank filled with about 1 litre of petroleum.

| Part No | Parts Name       | Part No | Parts Name     |
|---------|------------------|---------|----------------|
| 1 - 1   | Cap Nut          | 2 - 21  | Ball Valve     |
| 1 - 2   | Packing          | 2 - 22  | Cylinder       |
| 1 - 3   | Cap              |         |                |
| 1 - 4   | Sponge           | 3 - 1   | O ring         |
| 1 - 5   | Breeder          | 3 - 2   | Injection Pipe |
| 1 - 6   | Packing          | 3 - 6   | Stopper        |
| 1 - 7   | Strainer         | 3 - 9   | Wing Bolt      |
| 1 - 8   | Tank             | 3 - 10  | Ball Valve     |
| 1 - 9   | Name Plate       | 3 - 11  | Spring         |
| 1 - 10  | Caution Plate    | 3 - 12  | Nozzle         |
| 1 - 12  | Nut              | 3 - 13  | Cap            |
| 1 - 13  | Collar           |         |                |
| 2 - 1   | Yielding Rubber  |         |                |
| 2 - 2   | Nut              |         |                |
| 2 - 3   | Spring Washers   |         |                |
| 2 - 4   | Butt Handle      |         |                |
| 2 - 5   | Buffer Spring    |         |                |
| 2 - 6   | Seat             |         |                |
| 2 - 7   | Locking Nut      |         |                |
| 2 - 8   | Rod Guide        |         |                |
| 2 - 9   | Packing          |         |                |
| 2 - 10  | Packing          |         |                |
| 2 - 11  | Adjust Screw     |         |                |
| 2 - 12  | Graduation Plate |         |                |
| 2 - 13  | Rivet            |         |                |
| 2 - 14  | Bolt             |         |                |
| 2 - 15  | Rod              |         |                |
| 2 - 17  | Nut              |         |                |
| 2 - 18  | Piston           |         |                |
| 2 - 19  | Split Pin        |         |                |
| 2 - 20  | Piston Ring      |         |                |









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