

BOTANY-CHEMISTRY

# Chemical War on Weeds

**2,4-D, another wartime product, is being used as a household agent against weeds. It kills practically all plants except grasses, so don't get it on the flowers.**

By DR. FRANK THONE

► **CHEMICAL WARFARE** against weeds has been launched on a huge scale this spring. From coast to coast, whole armies of householders are enthusiastically pumping their spray-guns, dealing death to dandelions that have long made occupied territory of their lawns. Along with the dandelions, plantain, purslane, chickweed, wild garlic and many other disfigurers of green turf are curling up and quitting, under the deadly mist of 2,4-D.

That symbol, 2,4-D, has suddenly become as much a household word as the equally sensational bane to bugs, DDT. Like DDT, it is a synthetic organic chemical—its full name is 2-4-dichlorophenoxyacetic acid. And like DDT, it is a war baby, and is only now getting out of uniform.

The great virtue of 2,4-D is what plant scientists call its selective action. It will kill almost any plant except members of the grass family and their near relatives, such as sedges and rushes. That is what makes it so useful on lawns, golfing fairways and putting greens, and everywhere that you want grass and nothing else. It can also be used on weedy pastures, where such bad citizens of the plant world as ragweed and jimson weed have taken over.

Selective action of 2,4-D is not absolute. A few weeds resist it, and a few desirable grasses are harmed by it. This is especially true of the bent grasses, favorites for lawn and park planting in some localities. However, blue-grass, which is what most lawns are made of, can stand repeated spraying without harm.

## Kills Weeds but Not Corn

Another possible use for 2,4-D is killing cornfield weeds and eradicating such pests as wild mustard from fields of small grains; for all our grain crops are members of the grass family, so that the selective action of the weed-killer should work here, too. Preliminary experiments last year looked promising, and more extensive tests will be made this year by

federal and state agronomists. Results with sugarcane (another giant grass) have already proved conclusive. Cane planters are enthusiastic.

For mass killing of rank weed growths like poison ivy, Japanese honeysuckle and bindweed or wild morning-glory, 2,4-D looks like a first class weapon. To be sure, it has to be used in stronger concentration to kill these tough vegetable thugs, and more than one spraying will be necessary, but it will get them in the end.

For uses of this kind, where everything in sight is to be killed, 2,4-D will have to meet the competition of another weed killer, ammonium sulfamate. This compound was hailed as the white hope against weeds when it made its first appearance about four years ago, but since it is also a good flameproofing material the whole available supply was needed

for war purposes. It was not until after the collapse of the Axis that it became available for civilian purposes. It got a good enough try-out last year, however, to demonstrate its effectiveness.

## Replace Old Weed Killers

Either 2,4-D or ammonium sulfamate, whichever proves cheapest to use, is likely to replace the older mass weed killers, like oil and sodium chlorate. These had to be used in considerable quantity to be effective, and both presented rather bad fire risks. Sodium chlorate, indeed, is used in some kinds of explosives and fire-works. Dead weed leaves with this stuff dried on them can flash into flame like lightning at the touch of an unextinguished match or cigaret.

Tests with 2,4-D last summer showed that it could neutralize ragweed's power to cause hayfever by preventing it from shedding its pollen. By the same token, it would also prevent ragweed from perpetuating its evil kind, for both the common species of ragweeds are annuals, depending on seed for the next year's



**BEFORE AND AFTER**—What one of the new herbicides will do to poison ivy, one of our wickedest weeds, is well shown in this pair of pictures. The picture on the left shows the homemaker spraying the poison ivy, and the other shows the weed as it looked a couple of weeks later. In this instance the chemical used was ammonium sulfamate; 2,4-D would do the job just as effectively.

growth. Some ragweed seed always lies dormant in the soil, ready to come up not one but three or four years after it is produced. However, successive sprayings of the same patch could exhaust these vital reserves in a few seasons.

### Kills Seeds in Soil

Another possible tactic employing 2,4-D is its use in killing weed seeds in fallow fields, before the soil is made ready for a new planting. Tests showed that 2,4-D stirred into the upper layer of the soil would clean out all seeds, including grass seeds. It did the same thing when mixed with manure, which is often a source of weed seed when used for fertilizer.

Yet soil thus treated, as well as the soil under grass that has been sprayed, does not long hold its 2,4-D content. After a few months it has all disappeared, so that it is safe to plant any kind of seed you wish, even of highly sensitive vegetables and flowers.

What becomes of 2,4-D in the soil? Nobody knows yet; the whole thing is too new. Scientists conjecture that it may be made chemically inert by combination with substances in the soil, or (perhaps more likely) that fungi, which are everywhere and apparently ready to eat anything, may use it up for food. At any rate, it does obligingly get out of the way before next planting time.

### Non-Poisonous to Animals

Another nice thing about 2,4-D: it is non-poisonous to human beings and domestic animals. It was tried out on cows and ewes, and had no detectable effect at all on them. Samples of blood drawn from their veins showed its presence, but it did not get into their milk. Also, some hardy scientists swallowed samples of it, and felt no ill effects afterwards.

Just now, 2,4-D is getting practically all the attention, but it is only one member of a very large chemical family. It has about a hundred fairly close relatives among organic compounds, all of which are known to have effects on plant growth. Probably many of them could be used as weed killers also, and some may be even more effective than 2,4-D.

It should be remembered that 2,4-D is not like other plant poisons in its action. It belongs to the group of chemicals that in small doses cause more rapid growth but otherwise leave the plants normal. In the heavier concentrations used as weed killers it promotes a wild and unhealthy overgrowth of the tissues, causing the

leaves to pucker and twist and breaking down all internal communications. The plant acts almost as if it had suddenly become tumorous all over, and it dies of sheer inability to make its parts work together properly.

### Don't Use on Flowers

If the householder using 2,4-D in his private feud with the weeds in his own yard will remember just one thing, he will not have any trouble. That is the initial fact that 2,4-D will kill practically all plants except grass. It can therefore be used to clean up the lawn, but must never be used on weeds in vegetable or flower gardens.

If you want to use the same sprayer for 2,4-D on your lawn and for insect pests in your garden, you must make sure it is thoroughly cleaned up before putting in the insecticide. All parts of the sprayer must be well washed in hot soapsuds, or better yet, in kerosene.

Don't spray your lawn when there's a breeze stirring. If you do, some of the fine spray may drift onto your flower beds or shrub borders, with unfortunate consequences. If it gets on your neighbor's flowers or shrubs, that's even worse.

Do your spraying only on warm days; temperatures around 80 or 85 degrees Fahrenheit are best. Effects of the poison are best when the weeds' sap is moving most actively, so that it will be carried to the inner tissues and down to the root, getting in its deadly work all over.

In its pure form, 2,4-D is a white powder, practically insoluble in water. To make a water spray, it is necessary first to dissolve it in another chemical, and then mix this with water. It is in this dissolved form that 2,4-D is now offered on the market, under trade-names such as Weedone, Weedex, and the like. When this is mixed with water it still does not dissolve, but forms a milky emulsion which is a very good state for maximum distribution with a sprayer.

### Tiny Drops Most Effective

Another thing to be remembered is, the finer the spray, the more effective the spraying. This is because tiny drops, like the water droplets in a thick fog or Scotch mist, have much more wetting effect than larger ones. So if you are buying a new spraygun, the best economy is to get the one that produces the finest spray. In that way, you'll get the most dead dandelions per dollar's worth of 2,4-D.

*Science News Letter, June 8, 1946*

## PSYCHIATRY

### Jap Prisoners Suffer Long-Lasting Handicap

➤ BRUTALITIES suffered in Japanese prison camps have had a long-lasting handicapping effect on the personalities of even those with the healthiest make-up before the experience, reported Maj. Stewart Wolf and Lt. Col. Herbert S. Ripley, Jr., of the Army's Ninth General Hospital at the meeting of the American Psychiatric Association.

None of those heard from a year after repatriation are "really well and happy and effectively engaged in a suitable job," although several are carrying on "adequately in productive capacities," the Army medical officers reported.

All of those who answered questionnaires sent out by the doctors stated they had become less trusting of their fellows than before. Most of them reported optimism out of keeping with their handicaps and difficulties of adjustment to peacetime life.

*Science News Letter, June 8, 1946*

## PUBLIC HEALTH

### "Living" War Memorials Would Aid Handicapped

➤ "LIVING" war memorials in the form of centers for rehabilitating handicapped individuals are suggested as a community project to honor war heroes.

The Baruch Committee on Physical Medicine declares that helping the handicapped to become employable is cheaper than supporting such persons and their families on local assistance rolls, and that much needed hospital space could be freed by a rehabilitation project.

Not only city rehabilitation centers, but also mobile consultant clinics comparable to those used for cancer and crippled children programs are urged by the report to help all disabled individuals.

Some of the activities suggested for the "living" war memorials include physical medicine, psycho-social adjustment, vocational guidance, special education for the handicapped, a sheltered workshop, brace and limb shop, research in rehabilitation and an industrial placement program.

Once established, the committee says that such centers could be relatively self-supporting with funds from private patients, the Veterans Administration, state rehabilitation programs, industry and insurance companies.

*Science News Letter, June 8, 1946*