

Sweep in Chemical Summerfallow and Zero Tillage*

We at Chipman are quite excited with the very keen interest that is now shown by farmers in no-till summer fallow and zero till farming. Almost every farm journal printed has some article on the zero tillage aspect of farming. The farm shows the past couple of years have given an indication of the very sincere interest that farmers have to day in zero tillage.

We are pleased to be able to offer farmers a program of chemical farming that is competitive with the present day cultivation practices. With the ever increasing costs of petroleum products, machinery and labor the interest in zero tillage is becoming more apparent throughout the prairies.

I will confine my remarks in this presentation to the use of SWEEP as a chemical that may be used alone or in a tank mix with other herbicides for weed control in summerfallow and zero tillage farming and will briefly mention some of the new products and application systems that will be available in the near future to give even better weed control.

A lot of research has gone into developing a way to reduce or eliminate tillage operations in summer fallow. The secret has been the development of non residual contact herbicides which provide excellent weed control at reasonable cost.

Sweep herbicide has been developed specifically to fill this role. This presentation will show how tillage, as part of a summer fallow program, can be eliminated.

The substitution of chemical weed control for costly cultivation is what chemical fallow is all about. Chemical fallow offers farmers good reasons to switch to no-till or no-till crop management systems.

Reduced fuel consumption is one benefit which gains significance almost daily. The energy required to pull a sprayer is far less than that needed by land-engaging tools such as cultivators or discs.

Eliminating cultivation also saves time and labor expenses on the farm.

Wear and tear on equipment is reduced so capital costs are less and many repair bills are eliminated.

Chemical fallow results in much greater trash retention. Extra trash helps reduce soil loss from erosion by wind or water by holding the soil in place. Considerable loss can occur in traditional high tillage cultivation if winds or cloudbursts occur at the wrong time.

* Welland Stonehouse

a contact herbicide, coverage is of utmost importance. The sprayer must be completely calibrated and adjusted to provide complete coverage of all green growth. Nozzles should all be the proper size and worn nozzles must be replaced promptly.

Flat fan nozzles should be used so the spray pattern meets the top of the vegetation and ensure adequate overlap to prevent missed strips.

It is critical that Sweep, the chemical fallow herbicide is applied early to ensure complete success. Weeds such as wild oats, green fox tail and volunteer grain and broad leaf weeds should be in the 2 to 4 leaf stage.

Chemical fallow with Sweep ensures the maximum amount of straw and stubble is retained to increase winter protection for fall seeded wheat.

To control annual grasses Sweep alone at 2.25 litres in 110 litres of water per hectare is recommended. If broad leaf weeds are present use 2.25 litres of Sweep in 110 to 220 litres of water per hectare. (We will be selling Sweep in 5 gallon containers until the present supply is depleted with the recommendation of 25 acres per pail in at least 10 gallons of water per acre.)

We have made application and are awaiting approval for a full registration on Sweep for zero tillage operations.

Promoted mainly as a way to reduce energy costs and erosion while preserving soil moisture, zero tillage boils down basically to substituting herbicides for machinery and labor inputs. At the same time organic matter is being improved. It makes the soil easier to work, increases the soil water holding capacity and holds soil particles together in aggregates; an essential condition for good soil TILTH. This cementing effect of organic matter along with a proper trash cover prevents the loss of surface soil by wind and water erosion.

As with the no-till summer fallow concept, the same requirements exist such as spraying with 2,4-D in the fall for broad leaf winter annuals. If cheat grass or downy brome is a problem Sweep should be tank mixed with 2,4-D. It is equally important that the perennial weeds be controlled with a suitable herbicide whether in the fall or in crop.

Zero-tillage is defined as a crop production system whereby a crop is seeded directly into a used seed bed, (with minimum soil disturbance) which has not been tilled since the harvest of the previous crop. Although the concept of zero-

Trash retention is particularly important for Winter Wheat production. Full stubble, traps snow providing insulation at ground level for tender plants and also increasing the moisture reserve needed for rapid spring growth.

When seeding winter wheat into a full stubble the farmer is not required to seed deep. The placement of seed is within the top inch and a half where there is sufficient moisture to germinate quickly. The shallow seeding as well as the snow retention reduces or practically eliminates winter killing of the winter wheat crop.

A chemical fallow program based on Sweep No-Till herbicide offers these advantages and more. Sweep is completely non-residual so there can be no carry-over effects on following crops. Sweep eliminates tough annual grasses economically and is easily tank mixed with proven broad leaf herbicides to provide wide spectrum weed control. The only thing you have to add to Sweep is water. No spreaders, stickers or other adjuvants are required for effective grass control. The secret to the success of Sweep is spraying at the proper growth stage of the weeds, our recommendation is the 2 to 4 leaf stage.

For a chemical fallow program to be successful it is essential that:

1. The field is well drained and free of perennial weeds such as quack grass, Canada thistle, wild barley and so forth.
2. Good clear stubble is desirable for best results, loose trash often protects small weeds from chemical sprays and should be avoided.
3. The field should be sprayed in the fall with 2,4-D to control winter annuals such as flix weed, tanzy mustard and stink weeds. If the 2,4-D is not applied in the fall an early application in the spring is necessary. This should be done prior to active growth of the winter annual weeds.

To control winter annual grasses such as volunteer winter wheat volunteer fall rye or cheat grass (Downy brome) apply Sweep in the late fall just prior to freeze up. Established winter grasses are much harder to control in the spring.

Sweep may be tank mixed with 2,4-D for fall application if both winter annual grasses and broadleaf weeds are a problem.

Special attention must be given to spraying with Sweep. As

tillage is relatively new to prairie farmers, no-till planting or direct drilling have been practiced extensively in the United States and Great Britain for 25 years. On well managed zero-tillage cropping systems, annual weed populations have generally been found to decline. Cultivation encourages weed growth by bringing weed seeds to the surface, burying weed seeds, breaking latent dormancy of weed seeds, raising soil temperatures and reducing crop competition. For this reason soil disturbance should be kept to a minimum with seeding operations to avoid unnecessary weed growth.

For zero-tillage it is necessary to spray all weeds prior to seeding. Sweep will take care of all annual grasses including volunteer grains and wild oats. If broad leaf weeds are present the suitable herbicide may be tank mixed with Sweep to give complete weed control. Sweep is compatible with all broad leaf herbicides and our experience has shown that linuron plus MCPA gave the best results. Seed drills should be used that have sufficient trash clearance and penetration ability to ensure good seed placement with minimum soil disturbance. A common mistake made by farmers is cultivating prior to seeding as they feel it necessary to prepare a fine seed bed. This procedure eliminates the anchoring ability of the stubble. Loose trash with the loose soil makes it impossible to seed with most drills.

No-till summer fallow and zero till farming are becoming increasingly important. Sweep and broad leaf herbicides play a very important part in this farming operation for weed control. However we at Chipman have been working on developing new compounds and spray techniques which will have much more significance to the no-till farmer.

As I mentioned perennial weed control is necessary and at this time is very difficult to control. Our new product Fusilade which we hope to have registered for use on oil seed crops, vegetables and legumes as a grass killing herbicide will assist in the no-till and zero-till for wild barley and quack grass control. When tank mixed with Sweep you get the quick knock down and the Fusilade which acts much slower gives complete control of these troublesome weeds. It appears that fox tail barley becomes a real problem in some areas where no-till summer fallow is practiced.

We have also good news for a new compound from Du Pont that is giving excellent control of perennial weeds such as Canada thistle and sow thistle; when mixed with Sweep it gives a complete weed control program for no-till summer fallow. Hopefully, this product DPX 4189 will be available within the next couple of years.

Along with present use of Sweep, the present broad leaf herbicides and the new compounds expected to be registered for use on no-till summer fallow and zero-till farming. We are pleased to say that our parent company I.C.I. Plant Protection Division has developed a new spraying system which produces electrically - charged droplets of uniform size without moving parts. Droplets are propelled along paths that totally envelop the crop. The amount of chemical used and the energy needed are at ultra-low levels and the spray drift is virtually eliminated.

The heart of the electrodyne system, as it is called is the charged nozzle through which the liquid flows by gravity picking up its electric charges on the way. It emerges as a series of legaments.

These droplets move along the electric field existing between the positive nozzle and the earth target plants. This electric field envelops the whole plant. Since all the droplets carry the same charge and are mutually repellent each follows a set trajectory. The result is an even distribution of chemical over the upper and lower surfaces of all the leaves and stems.

Because the droplets are physically attracted to the target at quite high velocity, drift is dramatically reduced and spraying is possible under conditions that would rule out use of conventional sprayers. Droplet size can be controlled between 40 and 200 microns. At any given voltage droplet size is uniform. Voltage is high at about 20,000 volts but current is low so that operator safety is not a problem. At present this sprayer is being sold as a hand held sprayer in plantations where hand labor is prevalent. The tractor mounted sprayer is being developed by I.C.I. in the U.S.A. and could be introduced into Canada by 1983 or 1984. Work is also being done for aerial spraying. I feel that with our products now registered for use on no-till summer fallow and zero-till farming such as Sweep and broad leaf herbicides and our new products including Fusilade and Du Ponts DPX 4189 plus the electrodyne sprayer that we will have an exciting and beneficial program to offer the farmers on no-till summer fallow and zero-till farming.