Use of herbicides in TRANSI

In Southern California

Herbicide sprays that could control 80%-90% of the weeds in celery fields would reduce costly hand labor.

To determine the response of weeds and of celery to various herbicides, 12 randomized block experiments were conducted in commercial celery fields in Ventura and San Diego counties during the winter and spring of 1958-59.

The most troublesome weeds in celery vary with locality and season, and include chickweed, shepherd's-purse, nightshade, pigweed, nettle, mallow and lamb's-quarters. Grass weeds are a problem only in localized areas.

Herbicides Tested

The herbicides—in 100 gallons of solution per acre— were applied directly over the beds, in a band 18” wide. Single row plots 25’ long with three or four replications were used. A 20’ portion was harvested from each of the experimental plots.

Stoddard solvent—a selective weed oil—at the rate of 20 gallons per acre was included in some of the tests with CDEC and CIPC, to provide contact action on existing weeds. No oil injury was evident in Ventura County tests when the oil was properly emulsified in enough water to make 100 gallons per acre, using 20 gallons of oil per acre, alone or with CIPC. However, in the San Diego area, celery heart injury and burning of foliage were observed following a September application. Apparently considerable hazard accompanies the application of oil at any rate to celery during a period of hot weather.

Early Trials

In the early trials, post-planting applications of randox at four and eight pounds per acre; EPTC at five and 15 pounds; CDEC at four and eight pounds; and IPC at one and two pounds per acre caused no adverse effects on the celery but gave inconsistent results, with general lack of weed control. Monuron and diuron at one-half, one and two pounds per acre gave excellent weed control but were injurious to the celery, especially under conditions of high rainfall. Of these six materials, only CDEC was used in further trials.

Timing Tests

To determine the effect of the time of herbicide application on weed control and injury to celery, two randomized block experiments were set up in the spring of 1959, in adjacent plots. In one test, herbicides were applied to the formed beds on February 10, about one week before the plants were set out, and weed counts were made on March 6. In the other, herbicides were applied on March 6, about three weeks after transplanting, and weed counts were made on April 3. Weed populations consisted mainly of shepherd's-purse, but there were some small nettle and lamb's-quarters plants.

With the pre-planting treatment, satisfactory weed control was obtained with neburon at and above two pounds per acre; with simazine at one-half pound; and with CIPC at eight pounds plus stoddard solvent at 20 gallons per acre. CDEC up to eight pounds per acre, applied with stoddard solvent, was not satisfactory.

Nearly complete weed control was obtained in all post-planting treatments. Neburon was applied at one-six pounds per acre; simazine at one-half pound;
PLANTED CELERY

In Northern California

Chemical weed control methods now under development promise substantial savings in the million dollar weed bill of the growers of transplanted celery in California. The general method of weed control in the coastal counties is still cultivation and hand weeding.

During the spring and summer of 1958 and of 1959, 11 different herbicides were tested in eight experiments in commercial celery fields in San Luis Obispo, Santa Clara, and San Joaquin counties. Field rows were treated either shortly before transplanting the celery or about three weeks after transplanting. All treatments were applied directly over the beds. Plots—randomized blocks—varied from 25’ to 100’ long, were one bed wide, and were replicated four times in most trials. The rate of application was on the basis of active ingredients and actual area covered.

Pre-transplant Trials

Seven of the 11 herbicides were used in a pre-transplant experiment in San Luis Obispo County in 1958. The predominant weeds were small nettle, pigweed, and nightshade.

Weed control was 90% or higher with CDEC, CIPC, and neburon at eight pounds per acre and with simazine at one pound per acre. Weed control was not satisfactory with CDAA, EPTC, or IPC at any rate tested, up to 16 pounds per acre.

CIPC at two-eight pounds per acre plus stoddard solvent; and CDEC at four-eight pounds per acre also with the solvent.

Plant Injury

However, celery yields indicated that greater injury was caused by the post-planting than by the pre-planting treatments, except in the CDEC plots. In fact, pre-planting treatments with neburon gave higher yields than the control plots. Yields from the post-planting neburon treatments were not significantly reduced, but tended to decrease at the higher rates of application.

Yields

In early trials, no injury to the celery was observed following post-planting application of CIPC at rates up to six pounds, plus solvent. However, in 1959, the yield of celery from plots treated with CIPC plus stoddard solvent was significantly reduced at the 8-pound rate in the pre-planting treatments and at all rates—from two to eight pounds per acre—in the post-planting treatments.

Yields from the post-planting treatments with CIPC were significantly reduced at the higher rates of application.

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