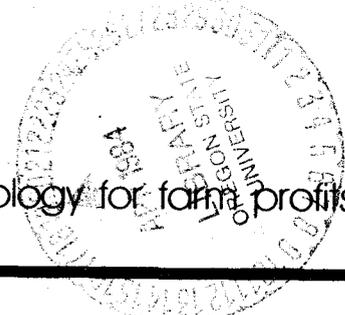


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INFORMATION FOR LEADERS IN LAND MANAGEMENT

Research and Extension in land management technology for farm profits and conservation of soil and water.

CONSERVATION TILLAGE FOR FIELD CORN PRODUCTION

The Problem

Conservation tillage, reduced tillage, and no-till management for field corn production have proven successful in maintaining yields and reducing erosion. Wind erosion control during seed germination and plant establishment is essential since young corn plants are very susceptible to abrasion by wind blown particles. Additional advantages of conservation tillage are lower production costs for fuel, equipment, and labor. Some growers may need some suggestions on the best ways to use these systems.

Suggestions

Preplant: Cropping systems that leave a substantial amount of residue on and in the soil reduce the hazards of wind erosion. Where an excess of residue remains from the preceding crop, some tillage may be necessary to facilitate planting corn. Reduction of the residue to a manageable level can be accomplished by partial incorporation with a disc or chisel plow. Where no residue remains in the fall from the preceding crop, it is essential that some kind of winter cover be grown. This could be a cereal crop such as winter wheat that would provide over-winter soil protection and a seedbed into which field corn could be planted with conservation tillage.

Planting: Equipment for conservation planting of field corn must be capable of placing the seed in firm contact with the soil while going through large quantities of surface residue and vegetation. There

are many possible equipment configurations with this capability, but a flex-unit planter equipped with a large fluted coulter in front of each planting unit is most commonly used. Some growers use a large double disc opener between the fluted coulter and the planting unit. The double disc opener places surface residue to the sides of the row and loosens soil which allows for better seed-soil contact.

Where light, frequent irrigations can be applied, shallower than normal planting is possible. This places the seed in contact with warmer soil and assures earlier emergence.

If corn is to be seeded into growing vegetation, better results will be obtained by applying a contact herbicide before rather than during or immediately after planting.

Fertilization: Banding fertilizers during the planting process, in contrast to broadcast applications, improves the efficiency of phosphorus, potassium, and zinc fertilizers. Ideally, the fertilizer bands should be two inches to the side and two inches below the seed. If banding is not practiced, than it is necessary to apply and work these fertilizers into the soil prior to the planting of the winter cover crop or during the partial incorporation of plant residues.

The bulk of the nitrogen fertilizer can be applied after the corn has emerged. Under center pivot irrigation, nitrogen can be applied with irrigation water. If



dry nitrogen or solutions are broadcast, they should be moved into the soil soon after application by tillage or with a light irrigation.

Weed control: Weeds are the most serious pest problem associated with conservation tillage corn production. Great care should be exercised in the selection of herbicides, application rates, and the timing of applications. The large amount of plant residue left on the soil surface to prevent erosion may interfere with herbicide-weed contact and herbicide distribution.

The Oregon Weed Control Handbook gives specific information on weed control for corn production. It lists herbicides labeled for conventional tillage and gives a separate listing of materials for land use in no-till corn production. Consult and carefully study the labels to determine which herbicides are suitable, and which combinations will result in the best weed control. It is important that application equipment is carefully calibrated.

Insects and Diseases: To date, in the Pacific Northwest, no serious corn insect or disease problems have developed where minimum tillage was used; however, there is a danger of disease problems developing where successive crops of corn are grown on the same land.

Crop rotation and banding of insecticides during corn planting will aid in minimizing damage from seed corn maggot, wire worms, cutworms, and miscellaneous soil insects. Consult current recommendations, and read labels before purchasing and applying insecticides.

Summary

Field corn grown on sandy soil is particularly subject to damage by wind erosion. Conservation tillage is an effective management practice for

producing competitive grain and silage yields and for controlling erosion. An additional advantage is the lowering of production costs for fuel, equipment, and labor. Essential features of conservation tillage for field corn are:

(1) planter units which will plant through large amounts of plant residue and dying vegetation, and (2) careful selection and application of herbicides for preplant and postplant weed control.

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