-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- **0068070** **-Session-1986-87**

-Superclass- **SK**

-Title- **TILLAGE (x $^1/_2$)**

-DESCRIPTION-

Type and Purpose

A specialist module ($^1/_2$) which enables the student to acquire the skills associated with tillage operations to create soil conditions necessary for the establishment of a crop.

Preferred Entry Level

08003 Introduction to Crops and Soils
08060 Tractor Operation 2

Learning Outcomes

The student should:

1. identify the main types of tillage equipment and describe their effects on the soil;
2. maintain and set a range of tillage equipment;
3. operate tillage equipment to produce desired results;
4. mark out an area to be cultivated;
5. estimate the work rate of a machine/implement.

Content/ Context

Corresponding to the Learning Outcomes:

1. the range of equipment should be appropriate to the student's situation by being either tractor or pedestrian operated, it should include: mouldboard ploughs, tined cultivators and harrows, power driven implements having a horizontal rotor and having vertical rotors, disc harrows, rollers and toolbars with hoes and ridging bodies fitted. Understanding of the effects of each implement upon the soil, according to weather and soil conditions.

2. with the aid of manufacturers' manuals identification and carrying out the required maintenance tasks on a mouldboard plough, one power take off (PTO) driven implement and one other implement. For the same implements, correct setting and adjusting of the tractor linkage, selection and use of the correct tractor external services, and making the necessary adjustments on the implement to achieve the soil condition required.

3. the selection of the engine speed, tractor gear and PTO speed (when applicable). The appropriate number of passes should be undertaken to achieve the desired soil condition with due regard for working loads and engine power. Use of the correct end rig with 'land' width and match bouts for a mouldboard plough and one other implement. Safe operation of implements at all times.

4. selection of the end rig width and 'land' width for an implement and then marking this out on part of a field prior to implement operation.

5. estimation of the work rate of an implement giving the nominal forward speed and working width, making due allowance for end rig turns, overlaps on adjacent bouts and wheel slip.

Suggested Learning and Teaching Approaches

This module offers the opportunity to combine workshop based maintenance and adjustments with practice in the field.

It should develop the student's ability to. interpret instructions and to modify them in the light of practical experience.

The tutor should have time for a programme of formative assessment which would then influence the choice and nature of demonstrations and group discussions.

Charts, notes, video and other appropriate aids should support the instruction. They could also give more practical meaning to preceding modules such as 08031 Plant Production from Seed. 08051 Fertilisers could be run concurrently with this module although seasonal factors would affect this.

A project in the form of a folder of the student's own findings should contain only material relevant to his range of implements and should develop from the dialogue (or conversely prompt dialogue) between the students and the teacher.

N.B. The observance of Safety Regulations and Codes of Practice relating to operation and maintenance of the tractor is vital.

Assessment Procedures

All Learning Outcomes must be validly assessed.

The student must be informed of the tasks which contribute to summative assessment. Any unsatisfactory aspects of performance should, if possible, be discussed with the student as and when they arise.

Acceptable performance in the module will be satisfactory achievement of the performance criteria specified for each Learning Outcome.

The following abbreviations are used below:

L0 Learning Outcome
IA Instrument of Assessment
PC Performance Criteria

LO1 IA Identification test.

PC The student identifies the following implements and indicates the main effect on the soil when correctly used.

(a) mouldboard plough;
(b) tined cultivator and harrow;
(c) a power driven implement with horizontal rotor and one with vertical rotors;
(d) a disc harrow;
(e) a roller;
(f) a toolbar with ridging bodies and one with hoes.

LO2 IA Practical exercises used with observation checklist, to maintain and set a mouldboard plough, one PTO driven implement and one non PTO driven implement.

PC The student:

(a) undertakes maintenance of the implement;

(b) sets the machine for a given application;

(c) uses the operators manual where appropriate;

(d) undertakes the tasks safely.

LO3 IA Practical exercises used with observation checklist covering the operation of a mouldboard plough, one PTO driven implement and one non PTO driven implement to achieve a given result.

PC The student:

(a) selects a suitable forward gear and engine speed for the task;

(b) selects the correct pto speed (where applicable);

(c) correctly uses hydraulics (where applicable);

(d) adjusts the setting of the equipment to obtain the desired soil condition to the correct depth;

(e) follows suitable field procedure;

(f) undertakes the tasks safely.

LO4 IA Practical exercises used with observation checklist involving the marking out of an area to be cultivated for a mouldboard plough and one other implement.

PC The student:

(a) identifies the field requirements of the implement;

(b) marks out an area for the implement in a recognised manner.

LO5 IA Written exercise involving the estimation of the work rate of an implement.

PC The student, given information on the working width of the implement and indicated forward speed of the tractor, calculates the work rate, making suitable estimates for lost time due to end rig turns, overlaps on adjacent bouts and wheel slip.