and in order to achieve this objective the breeder must alter the pattern of leaf growth. Advanced leaf growth seems invariably to be associated with early senescence and vice versa. Two alternatives, therefore, exist for the breeder; either to improve the rate of ground cover in spring by increasing growth rate at low temperatures or to prolong it into the autumn. Given the seasonal distribution of incident radiation and the practical disadvantages of delayed harvest, it is strongly suggested that improvement in early leaf growth would be the appropriate approach. The limited data available suggest that existing varieties do differ in the production of leaves at low temperatures.

Light interception may also be improved by altering the arrangement of leaves. Horizontal leaves intercept more light than erect leaves at low leaf area indices and potato varieties differ considerably in this character. After the formation of a closed leaf canopy the effects of leaf arrangement are small, for few crops reach the very high leaf area indices at which erect leaves would improve growth rates. The major impediment to continued functioning of the closed canopy is lodging and more attention must be paid to this character.

In attempts to increase the yield potential of varieties the relationship between number of tubers and yield is crucial. If yields are to be raised without excessive production of oversize tubers then the number of tubers must be increased also. There is a danger that this will not occur if selection is carried out where yields are low. Manipulation of number of tubers is also important in controlling dry-matter contents in potatoes destined for processing.

Report of the meeting of the Engineering Section, Wageningen, Netherlands, 8–12 September 1980

The Engineering Section Conference held in Wageningen was presided over by its chairman Prof. Dr T. Karwowski. It was attended by 20 scientists from 10 countries. The sessions of the conference were presided over by: Ir G. J. Poesse, Dr D. C. McRae and Dr B. Scholz.

Ten papers dealt with various aspects of separating stones, clods and haulms, for instance by adequate tilling and removing stones before planting, removing the haulm by various methods, breaking clods and separating them as well as stones during and after harvest. Following presentation of the papers and their discussion, the possibilities of extending the membership of the Engineering Section were considered and it was concluded to discuss the problem further at the 8th Triennial Conference to be held in Munich in 1981. The subjects of papers to be prepared by members for the Conference were also discussed.

Within the meeting two excursions were arranged: to an Experimental Farm of the IMAG at Slootdorp and to the Amac Factory at 's Heerenhoek. During the excursion to Slootdorp the staff demonstrated to participants the techniques for growing and storing potatoes followed in the Netherlands. There were displays of machines used for seedbed preparation, planting tubers (including those chitted), removing haulms and harvesting as well as methods and machinery for storing potatoes.

The participants expressed their warm thanks to the director of IMAG Ir F.
Coolman and to the organizing committee in the persons of: Ir G. J. Poesse, Ir A. Bouman, Ir M. M. de Lint, Dr Ir D. E. van der Zaag, Ir J. Drijver for the skilful management of the conference. Special emphasis was put on the outstanding contribution made by Ir A. Bouman to ensure the success of the conference.

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C. D. van Loon (Lelystad, Netherlands): *The consequences of tuber damage*

Tuber damage can cause a substantial loss in gross income. Smittle (1968) in Washington State, USA, cites 20 % loss of potential gross income through reduction in yield and loss of quality.

Damage takes the form of skinning, cuts, or deep wounds and internal bruising. Mechanical damage can lead to weight loss in storage and the development of disease, with resulting blemishes, which all reduce the marketable yield. Weight losses due to damage can be greater in seed (11 %) than in ware potatoes (9.3 %).

Diseases associated with damaged potatoes include dry rot, gangrene, wet rot and skin spot. Extra costs are incurred when these potatoes have to be removed during grading and inspection. As yet, there is no way of removing bruised potatoes during grading and this is proving a big problem in the French fry (chips, UK) industry.

When over 50 % of tubers have defects, trimming requires 1 man-hour/tonne, whereas for about 85 % defects up to 4.5 man-hours/tonne are needed. The trimming loss is typically 4.5 % and costs Dfl 101/t. As a result of damage, the extra operations involved and overall loss of tonnage, reduce the capacity of processing plants and so the price to the farmer may be lower. In the case of potatoes for the table, internal damage can have a negative effect on consumption.

It appears that internal bruising has increased in the Netherlands, from 1.8 % in 1976 to 8.0 % in 1978. An incentive scheme is now operated in which potatoes command 10 % premium (Grade 1 extra) and 5 % for Grade 1. For a farmer with 10 ha of potatoes and a total yield of 450 tonnes, the difference in value between the best and poorest grades could be Dfl 18 000.

Throughout Holland a campaign to reduce damage is being pursued. Samples of tubers are collected and damage evaluation carried out. Some 120 damage detection kits containing the equipment needed for staining with catechol have been bought by potato merchants, who carry out the assessments. Though catechol can be used only to detect external damage, it is considered that there is a relationship between skin and surface damage and bruising such that if the level of abuse is high enough to induce surface damage this is an indication of the probable presence of internal damage.