LOOKING AHEAD

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This short paper is written at the request of the Agricultural Officer of the Experiment Station, to tie up with other papers being presented on different aspects of Sugar Industry work, and is an attempt to indicate the more immediate directions in which growers might profitably direct their energies with a view to improvement in crops and economy.

The paper concerns itself mostly with the mechanical approach to labour saving, but insofar as they affect the soil and its fertility, mechanical developments must be made in close touch with expert agricultural opinion. There are occasions when the direct apparent advantages of machine use can be offset in time by deleterious effects on the soil; while on the other hand, there are occasions when research indicates possible benefits to be derived from new mechanical techniques as applied to the soil, and it is the object of the several Research Organisations in this Industry to maintain that close liaison.

Again, this paper will trespass slightly into the realm of fertilization, but only insofar as fertilizing can be considered a labour saving agent, and it is one of the most important. Proper co-ordination of trash blanketing and fertilization policy is still the most outstanding labour saving "device" that has become available to the Industry in recent years, and is a subject which will repay infinite research. It is not a simple subject—on the contrary it is highly complex, and introduces a completely new set of factors into agriculture that are not perhaps, at present, fully appreciated. Nevertheless, it is safe to say from experience so far gained, that we have in this the means to double the output of sugar per acre in this Industry in a very few years. I make this prediction in full awareness of the probable comments of the cynics.

Below, then, I will review very briefly some of the more promising innovations of method, with short comments where necessary.

Preparation by Chisels.

Advantages: Better done in dry conditions, making possible winter preparation of soils so that they are ready in the early spring. Spring rains not lost as with ploughs, which plough out the moisture. No inversion of soil, with consequent possible upset of bacterial life. No lateral displacement of soil —important on steep slopes. No revolving parts.

Disadvantages: Straw and trash obstruct. Unsuitable for badly drained ground.

Possibilities: In well maintained soils, such as those trash blanketed for many years, organic content will be high, and friability adequate. These soils will not require extended weathering and exposure by ploughs for preparation of seed bed. Chiselling, supplemented by a rotary hoe, will give instantaneous seed bed, capable of being planted immediately, thereby limiting to a minimum the exposure time to the elements in this severe climate. Soils that are ploughed *must* have enough time to weather, and recover their balance, before they can be replanted to crops. It is during this period that they are most vulnerable to adverse weather conditions.

Planting.

Practical advantages of mechanical planting proved. Enables planting to commence before spring rains arrive, provided moisture is conserved under trash blanket until time of preparation as described above. Preparation done with chisels does not evaporate moisture, and machine can be used at any time provided sub-surface moisture is adequate. With efficient planting machines now being evolved, depth of cover can be accurately controlled for varying soil types, and varying temperatures. Planting machines must come back in Industry, and will stay. Enormous advantage to be gained by planting at optimum seasons, i.e. Spring, and this is possible with machines.

Weed Control.

Until chemical weed control for this country is better understood, it is essential that advantage be taken of mechanical control as developed in this Industry. Methods compare well with those used in any country, and are especially adapted to suit our more hilly conditions. The speed of mechanical planters must be matched by that of mechanical weeders, otherwise the advantage of the former is lost.

Trash Blanketing.

Trash blanketing has come to stay, and is a labour saving device of the ideal variety. It is simple, cheap, and readily available.

Fertilizing.

With trash blanketing, ratoon fertilizing becomes well worth while, and results do not have to be assessed on a delicate balance—they are obvious to the eye. Fertilizing becomes a "must", and saves its cost many times over in reduced weeding, larger crops, and longer ratoons. The simplest

way to apply the fertilizer is to use granulated types, and cheap machines such as the Maxim. These, too, have come to stay.

Loading and Transport.

Labour pressure is only beginning to make itself felt on present methods. For short hauls, expensive lorries are being superseded by more economical tractors and trailers. These go far enough at the moment, in that they economise labour by eliminating long carries. The use of two or three detachable trailers makes possible better tractor efficiency, and as labour pressure increases, self loading trailers will come more into the picture. Two practicable types have been evolved and are on the shelf awaiting demand. The demand is probably not far away now. To get utmost efficiency out of trailers, field lay-out must be considered, and future needs anticipated. Trailers can not cross open drains or obstructions when heavily loaded, nor can they abide bogs. Sub-surface drainage, with tiles, makes it possible to take trailers anywhere, and this should be commenced with any new plantings. Similarly, a trailer loaded to the full capacity of the tractor, can not be towed successfully uphill. Layout must therefore be arranged so that tractors come into the fields at the hill tops—pick up the load on the down slope, and pull away *down hill*. The hardened roads *must* be at the bottom of the hills, and if the valley drain is tiled, the old drain can then be used as the road—*at the very bottom of the hill*. In this way, maximum efficiency can be got from tractor and trailer loadings.

Transloading.

Gantries are proving their worth for transloading into gollovanes, and their use is increasing daily. Their cost, since they do not need to be mobile, is well within present economics. Machinery for transloading trailer loads into S.A.R. wagons is much more expensive, however, and is not economic at anything less than say 100 tons per day, which is beyond the scope of most growers at present. Any reduction in available labour will, however, increase the necessity for conserving the labour at present used for hand loading S.A.R.'s, and the only possible approach that can at present be visualised is the joint purchase by several growers of suitable cranes. There does not seem to be any immediate prospect of producing a mobile crane to handle trailer loads at an economic figure, where only one or two railway wagons are loaded daily.

Harvesting.

This will be the final, and most expensive, item on the list of mechanical developments. Work is progressing steadily towards producing one suitable for our conditions. Mechanical harvesters are available today that involve the burning of the cane, but the economy and general benefit to be derived from trash conservation in present circumstances, make it highly improbable that the use of these would be justified. Mechanical harvesting is still a year or two away for this Industry, and field lay-out will have to be prepared ahead for its use, on the lines indicated above. In the meanwhile, general use of the machines mentioned above should relieve labour pressure for a few years yet, and even if the smaller producers can not yet afford the capital cost of equipment, effective use by larger producing units will release labour to the general pool, and so ease the demand on labour for the next few years.