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Water Usage

Trials with Bananas on the Gascoyne

By W. M. NUNN, B.Sc. (Agric.), Officer-in-Charge, North-West Branch.

The banana industry at Carnarvon is an unusual one by most agricultural standards. Normally a tropical plant liking relatively humid conditions in a high rainfall, the banana is cultivated at Carnarvon in an area of extremely low rainfall and with relatively low humidity throughout the year. Water is pumped to irrigate the crop from the sands of the Gascoyne River bed or from bores adjacent to the river course.

Since most of the soils are free-draining, sandy loams, and the banana a fast-growing plant of considerable bulk and water content, it is to be expected that water usage would be higher than for most agricultural crops.

Unfortunately the Gascoyne settlement water supplies are somewhat insecure and dependent upon rain falling over a distant inland catchment area in pastoral regions of low rainfall.

So-called “first-water” or “top-sand” reserves are tapped at depth of 10 to 20 ft. and, unless the river flows with regularity, can be very quickly exhausted.

Additional supplies have been obtained in dry periods, by drilling to depths of up to 60 ft., when “second water” rises in the bore to augment the failing top reserves.

Recent exploratory work carried out by Public Works Department has shown that these second waters cannot be relied on to provide any lasting improvement, and that hope for augmenting supplies lies rather in piping water from a few miles higher up the river where “top reserves” are held back by a natural clay barrier.

If this proposal is implemented some considerable improvement can be expected. The plan however, calls for extensive Government planning and expenditure and must take some years to achieve.

In the meantime the district has voted in favour of a scheme to provide some
control over the use of water, and a Committee consisting of grower and Government representatives meets regularly to advise the Minister for Works and Water Supplies. Meters have been provided and a water usage rate determined for several of the larger growers, and since it is impossible for the present to obtain and fit meters all round, the remaining growers are controlled on a restricted acreage basis. Quantities and acreages will be varied by the committee according to season and river reserves.

This represents some very real progress toward safe-guarding the industry against recurring water shortages, but the old question arises—Should bananas really use as much water as they do under existing methods?

In determining a rate of application in order to correlate acreages and water rates for the present control schedules, district methods were assessed as averaging a water application of 1 ft. per month, or 12 ft. per year. This is a moderate estimate based on efficient working with good channel control, and we know that there are growers who use considerably more than this.
Making due allowance for rainfall differences it can be said that bananas at Carnarvon use at least half as much again, and possibly twice as much water as is used on such crops as lucerne in other irrigation areas.

With the very dry climate, the freely draining soils and the prolific growth of the banana stool, this may not be surprising or unexpected but it does occasion the thought—"Can we help the present situation by devising methods of economising on water applications?"

The possible use of sprinkler irrigation immediately suggests itself as a water saver, but sprinklers have been tried without success on a number of occasions. In actual trials on the Gascoyne Research Station, with sprinklers mounted both above and below the canopy, the result was the same—"raindrop splash" caused a sealing of the surface soil, preventing penetration and causing water to run off and accumulate in low spots.

In a trial commenced in 1954 and continued over four years, several different rates of flooding were compared with the integrals between watering rates previously used. Another section of the trial applied the standard 4 in. watering at varying intervals.

In both sections it was shown that reduction of water below the customary application delayed early development, but that once the canopy stage was attained the initially retarded plots rapidly caught up and produced as well as any.

During the period of dwindling water supplies in 1959 a number of growers took their cue from these experiments and either reduced applications, or lengthened intervals on developed plantations, with quite successful results.

With the detail now being collected in connection with the water control operations a much more accurate assessment of water use and water requirement should be possible. On present information it would seem that many growers could halve their water usage once the plantation is in production, without detriment to yield.

There remains the problem of high requirement during early stages, and this is the subject of a study recently commenced with experimental plots established on the property of Mr. W. Smales, on the lighter soils of the north side of the river.

Three different planting systems are compared—two watered by different furrow systems and one by flooding of bay, but with a surface cover of polythene film. A series of decreasing frequencies of watering is superimposed on the three planting systems.

Similar trials are planned for vegetable crops during the 1960 season, and it is hoped that, before long we may have accumulated reliable data to aid the planter in his effort to make best use of limited water supplies, and the River Advisory Committee in its effort to devise a rational basis for control of water distribution.
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