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The growing season

Department of Agriculture, Western Australia

Bureau of Meteorology

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Meteorological Notes

The Growing Season

By the Bureau of Meteorology

In Australia the seasons of summer, autumn, winter and spring do not have the importance that they have in the Old World, and though summer and winter weather are quite different, there is not the obvious difference in autumn and spring conditions that there is in the colder countries.

This is largely due to the difference in vegetation and in its life cycle in the different places. In Europe for instance, autumn is the time of falling leaves, when growth is slowing down in preparation for the period of dormancy during the cold of the winter. Here the cycle is reversed, and at this time of the year the first green growth appears in the brown dried up countryside. It flourishes during winter, but in spring, when the northern hemisphere is bursting into new growth, ours commences to dry out; annuals die and perennials become dormant during the summer.

Some of these differences are due to the different temperatures experienced, but the main factor influencing the growth of crops and pastures in Australia is rainfall— or the lack of it.

In the agricultural area of Western Australia the year may be divided into two main periods:

- The time during which annual plants will grow under natural rainfall conditions.
- The remainder of the year when they will not survive without watering.

Because in the southern half of the State our rainfall is of the winter type and summer rainfall is negligible in most places, the growing season commences usually towards the beginning of winter and finishes sometime after it. Near the west and south coasts where rainfall is high the season begins earlier and lasts longer, but it is not only due to the earlier and later rains that the season is longer in these areas.

The rate at which water is used by a plant depends on temperature and humidity, as moisture stored in the soil is transpired (or pumped out) by the plant faster in hot dry climates than in areas where it is cooler and more humid. Because of this a given amount of rain will be more effective in prolonging the growing season in the cooler areas, than in the hotter, drier districts.

![Graph showing average rainfall and effective rainfall for different locations in Western Australia.](image-url)
The minimum amount of rainfall necessary to initiate plant growth and maintain it above the wilting point, can be related to evaporation from a free water surface. This amount is sometimes termed the “effective rainfall” and may be estimated by the use of Prescott’s formula \( P/E = 0.7 = 0.54 \), where \( P \) is “effective rainfall” and \( E \) evaporation from a free water surface, both in inches per month. If, in any month, the amount of rainfall received is greater than the “effective rainfall,” that month is regarded as being part of the growing season.

The average length of the growing season at a particular centre may be obtained by drawing two curves, one showing average effective rainfall and the other average rainfall for the place concerned.

The effective rainfall curve is high at the beginning and end of the year and low in the winter months. The average rainfall curve is low in summer and high in winter, so that the curves intersect twice during the year. These points of intersection may be taken to represent the beginning and end of the growing season, as between these points average rainfall is greater than the minimum amount required to keep plants alive. The distance between the curves in the non-growing season might be regarded as an indication of aridity, as it represents the amount by which average rainfall falls short of that required to support life at the particular time of the year.

Figure 1 shows examples of these curves for places between Perth and Balladonia. Figure 2 shows the date of the opening of the growing season in the agricultural areas, and Figure 3 shows its length, as determined from a network of these curves.

To some extent the distance between the curves during the growing season provides an indication of its reliability. It can be seen that a surplus or deficit of an inch in any month at Perth will not alter the growing season very much, whereas at Lake Varley or Salmon Gums it could lengthen or shorten the season by a considerable amount.

The curves do not take into account water which may be stored in the soil before the season opens or any surplus which may remain in the soil at the time of the close of the season. However in most cases these will be comparatively small amounts.
Because different crops have different water requirements, the length of the season will vary to some extent with different crops. In addition, it should be remembered that the curves represent average conditions, and that there may be a marked variation between individual seasons.

Despite these variations, the data of Figs. 1 to 3 are very useful when comparing the agricultural potential of one district with that of another.

FIG. 3.—THE PERIOD DURING WHICH AVERAGE RAINFALL EXCEEDS EFFECTIVE RAINFALL (MONTHS)