

Die belangrikheid van elektrisiteitskoste by besproeiingsboerdery

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Abstract

The purpose of this study was to determine the importance of electricity costs in irrigation farming in the Winterton area. Cost analyses were done by means of computer programs for typical centre-pivot and drag-line systems, with due observance of cash crops (maize, soy beans and wheat) and grazing crops (kikuyu and rye-grass). On average the cost of electricity accounts for 75 per cent and 88 per cent of the variable irrigation costs for centre-pivot and drag-line systems respectively. The percentage contribution of electricity cost to the total variable production cost varies between 10 and 29 per cent for cash and grazing crops. The importance of the cost of electricity depends on the amount of irrigation that is applied, as well as on the design of the system. As the cost of electricity is one of the major cost components in irrigation farming, the amount of irrigation, the irrigation system design and electricity tariffs must be managed effectively to minimise the electricity costs.

Summary

The importance of the cost of electricity in irrigation farming

The purpose of this study was to determine the importance of the cost of electricity in irrigation farming in the Winterton area. The extent to which electricity is used, the influence of the design of the irrigation system on the cost of electricity and the contribution of the cost of electricity to the total variable cost of irrigation and production have been estimated.

Five typical centre-pivot systems and six typical drag-line systems were assembled for the area, with due observance of cash crops (maize, soy beans and wheat) and grazing crops (kikuyu and rye-grass). The same type of soil was used for all the systems, but the application capacity, static pumping height, pumping pressure and motor size of the systems varied. Information on electricity consumption of 36 farmers was analysed. The annual variable cost of the irrigation as well as the crop rotation systems was estimated by means of a computer program. Data on the irrigation system and management, electricity tariffs, inflation and interest rates, as well as the inputs for crop cultivation were fed into the computer programs.

The results have indicated that static pumping height is the major attribute of the irrigation system design influencing the electricity cost of applied water. The difference in total electricity cost between systems is mainly determined by differences in pumping pressure and, as a result, the size of the motor. The capacity differences of systems do not have such an important influence. Electricity costs account for an average of 75 percent and 88 percent of the total variable irrigation costs of centre-pivot and drag-line systems respectively. At the enterprise level, where electricity costs account for no less than 10 per cent and even as much as 29 per cent of the total variable costs, the cost of electricity is one of the major variable cost items. Further it has also become apparent that the total annual kWh usage of an irrigation system is mainly determined by the design of the system and the amount of irrigation, and also that the amount of irrigation applied determines the importance of the cost of electricity. Thus, the more the irrigation applied, the greater the contribution of the cost of electricity to the total variable cost, and the more important the cost of electricity. The electricity consumption of farmers varies from 2 449 kWh to 1 793 922 kWh per annum, and the average variable cost of electricity per farmer amounted to R44 910 in 1993.

Because the cost of electricity is one of the most important cost components in irrigation farming, the amount of irrigation, the design of the system and the electricity tariffs must be managed effectively to minimize the cost of electricity.

Uittreksel

Die doel van die ondersoek was om die belangrikheid van elektrisiteitskoste by besproeiingsboerdery in die Wintertongebied te bepaal. Koste-ontledings is vir (spilpunt- en handlynstelsels, ingesluit mielies, sojabone, koring, kikoejoe en raagrass, met behulp van rekenaarprogramme gedoen. Elektrisiteitskoste maak gemiddeld 75 persent en 88 persent uit van veranderlike besproeiingskoste vir spilpunt- en handlynstelsels onderskeidelik. Die persentasie bydrae van elektrisiteitskoste tot totale veranderlike produksiekoste wissel tussen 10 en 29 persent vir kontant- en weidingsgewasse. Die belangrikheid van elektrisiteitskoste hang af van die hoeveelheid besproeiing wat plaasvind sowel as van die stelselontwerp. Omdat elektrisiteitskoste een van die belangrikste kostekomponente by besproeiingsboerdery is, moet die besproeiingshoeveelheid, besproeiingsstelselontwerp en elektrisiteitstariewe sodanig bestuur word om elektrisiteitskoste te minimeer.

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Received 12 January 1996; accepted in revised form 4 June 1996.