

CROP-WEATHER MODELLING - a review  
(as applicable to northeast Brazil)<sup>1</sup>

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To improve the crop productivity by experimentation involve both time and money. Crop-weather models serve this purpose in some respects by understanding and relating climate to crop production. The literature is replete with such models. They can be arranged into three broad categories, namely i) climatological; ii) water-stress; and iii) dynamic crop-weather models. In climatological models productivity is related to few randomly identified weather parameters. They are highly location specific and hence they are less suitable for regional planning. In water stress models relative yields are related to relative evapotranspiration or relative transpiration or relative percent soil moisture. Under dryland situations the models that present relative to soil moisture are unsuitable as there are no models that predict the soil moisture accurately in different layers of the soil. In the case of other types the linear and additive models appear

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to be highly location and year or season specific. The multiplicative models those that accounts the differential effect of growth stages appear to explain more than 60% of variance in the productivity. However, yield is not only influenced by stress but also with soil type and waterlogging. In addition, temperature and radiation also influence the productivity when one considers wider regions and years. Dynamic crop-growth models integrate complex processes of crop growth & development through climatic parameters. However, some of the models require a lot of crop information, which is rarely quantified for northeast Brazil. Also, in these models weightage is given more to radiation and temperature compared to water stress. The latter is more important in dry tropics. Hence, as a compromise between water stress and dynamic crop-growth models, a simple model as suitable to northeast Brazil is suggested.