SCIENCE DU SOL n° 1986/1 - pp. 127-128 - PLAISIR-FRANCE

TECHNICAL ISSUES OF SOWING

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(Science du Sol n° 1982-3)

The processes of germination and emergence of a plant are briefly described, in order to explain the requirements for a good implantation of a crop, and recall that the duration of this phase is determined by the seed-bed temperature, but may be lengthened by water lack. In most countries, the period of full growth is chosen to coincide with best climatic conditions. So that, the conditions then can often be rather poor : cold at the beginning of spring, in temperate areas, dry during autumn in the mediterranean regions or at the very beginning of the rain season in dry tropical regions.

The main tests of sowing estimates are :

— the distribution and the mean value of emergence time ;

— the emergence rate, which defines a part of the stand homogeneity (the relations between this rate and the respective frequencies of available area, and the number of plants on an elementary surface or a an hill are mentioned) ;

— the initial CGR which, in addition to climatic conditions depends on the real status of the seeds and the sowing depth. For seeds in good conditions there is no relation between RGR and emergence time.

The connections between emergence quality and yield vary with the species. If the stand structure is however homogeneous, a poor or late emergence is detrimental to yield only when some growth factors are not exploited by the plants, or when the harvesting is relatively premature. In a heterogeneous stand (for growth and development), the effects of the emergence depend on the climatic conditions necessary for development. Defavorable results occur when the « harvest index » depends on the individual size, or when this size governs market factors (in sugar-beet, for instance). A classification is given according to the time of sowing, the sowing density and the species (Table I).

Table 1 : Results of the failure of sowing on Yield.

	CROP	Sugar beet	Maize	Sunflower	Winter cereals	Spring cereals	Bean	Winter oil rape
CRITERION OF FAILURE	Large meantime of emergence	+++	++++	+++	+	++	++	+++
	Emergence over a prolonged period	++	++++	++	+	++	+++	++
	Low % of establishment	+++	++++	++	+	++	++	+
	Low growth rate after emergence	+++	++++	++	+ to +++	+	++	+

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The technical decisions are discussed. In addition to the usual aspects of seed quality, the usefulness of large seeds is studied, by emphasizing that RGR and size are not linked. The different functions of sowing machine are analysed. Soil tillage must comply with contradictory requirements : a good implantation of the stand (water absorption, respiration, emergence), without making more brittle the soil structure towards climate.

The farmer's decision depends also on the availability of the implements, specially the drill which is not always his ownership. In order respects, better references are necessary, which have regard for climatic variations (concerning soil tillage, sowing density and spatial arrangement according to limiting factors). After sowing, shallow tillage may, correct the seed-bed ; after emergence thinning is nowadays scarcely possible, in the most farming systems. Only for some crops (cereals, maybe oil-seed rape) nitrogenous fertilization allows an adjustement of the stand by controlling tillering or branching.

In conclusion, it's recalled that higher is the new cultivar's potential, higher are the requirements for sowing.