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Trends in sowing and fertilising

Presented here are important technical trends in sowing technology and mineral fertilising as reflected in the machinery and equipment program at Agritechnica 2001. The preview cannot take the place of a visit to the event and instead only offers preliminary information and does not claim to be comprehensive.

Continued development toward globalisation, stronger market-orientation and subsidy reduction whilst costs of meeting environment protection based regulations increase, increases the need for rationalisation, labour cuts and unit cost reduction in sowing and fertiliser application. Specially interesting as aids here are minimum cultivation, direct drilling and electronically controlled fertiliser application. Properly done, such techniques satisfy the aims a high standard of sustainable rationalisation and environmental protection.

Numerous machines and implements for seeding and fertilising nowadays already represent the highest technological standards for functionality, reliability and performance. Measured against the currently available top technology there are no surprising technical innovations to be expected – only the adopting of such standards by further manufacturers.

Development tendencies in drilling machinery

A large choice of proven machinery is available for cereal drilling. The continuing trend towards greater working widths means pneumatic systems gain in importance. An aspect still needing improvement in volume dosage machines is the consistency of seed longitudinal spacings in the row. There are a few interesting developments here which allow definite improvements in drilling quality although they're not yet ready for production. Without changes in coulter area design the problem cannot be solved by improved metering systems alone.

Drills

Stepless electro or hydro motor drive for seed metering for varying seeding rate on-the-go is attracting more interest. Used with electronic regulation this offers the requirements for spatially-specific drilling. Possible is also the application of different varieties specifically for hollows, hummocks and slopes in the field. The machines would need several seed hoppers and GPS controlled position regulation to facilitate this. Such developments can be seen in offerings from some manufacturers although one cannot yet speak of a breakthrough.

To be expected is a wide range of machines suitable for minimum cultivations and direct drilling. These, mainly with disc coulters, are often combined with shallow-working cultivators up front for incorporation and breaking down the soil and then described as universal drills which can be applied in plough, minimum cultivation or direct drilling systems whereby suitability for the second is in the foreground. Such machines are currently offered by most manufacturers whereby universal ability is only actually there with a few of them.

There are new coulter developments for improving seed placement and deposition, e.g., disc coulters with depth limiters, allowing improvement of machine functionality and work quality.

Wide working widths, high drilling speeds and large capacity hoppers enable such machines to cover up to 100 ha/day. Only a few manufacturers also offer drills suitable for no-till ground

Precision drills

With precision drills the known and proven solutions have become established, whether the mechanical seeding organ for beet seed or pneumatic for maize. Apart from a few detail improvements, e.g., hydraulic folding frames, there are no particular innovations to be expected here. For establishing beet tramlines and stepless alterations in seed spacing in the row, electronically controlled electromotoric drive for every seed organ has become established. The greater working width trend in minimum cultivations, too, will also continue. Also increasing is the area of minimum cultivation establishment in sugar beet and maize. Most manufacturers offer suitable extra accessory equipment such as cutting discs for minimally cultivated ground. On the other hand, there are still no precision seeding machines on the German market which are suitable for direct drilling.

Electronic equipment for monitoring, steering and regulating various functions are standard with most manufacturers nowadays. However, a GPS supported seeding rate variator suitable for serial production is not yet available on the German market.

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High area performance packer coulter drill from BBG-Amazone with up to 9 m working width

Development tendencies in mineral fertilising

High area performance spreader from Hufgard with twin disc system for spreading lime, poultry manure and also mineral fertiliser

The standard of technology is at a very high level, especially for the twin disc spreaders which represent the main design on offer. Machines from leading producers enable high-precision distribution with nearly all types of mineral fertiliser at working widths of up to 24 m, and even over 36 m with fertilisers that have very good spreading properties. The demands for higher precision in application have been met from the technological aspect.

Around 80% of total fertiliser is nowadays spread by twin-disc machines. These have proved successful through their precision, robustness, and high performance capacity. Important characteristics are steplessly-adjustable working widths from 14 to 48 m, automatic fertiliser metering, e.g., via online calibrations with the help of integrated weight cells, and also with electronically-controlled border spreading applications.

The technology for spatially-specific fertiliser application has, in the meantime, reached the standard for serial production so that the focus for development has moved to the software. Problems are still caused by lack of standardisation of electronic compatibility between tractor and implements (terminal/job processor). Now many job processors are on offer that are compatible with tractor-implement controls which, after completion of the appropriate standardisation work, also fulfil the conditions for ISO-11783 compatibility. The use of standardised interfaces between job processor and tractor terminal gives the farmer the advantage independently from the manufacturer of the job processor or terminal, of free choice regarding the machinery combination through having the same operational interfaces.

Alongside standard mounted fertiliser spreaders there are also improvements in large capacity spreaders, e.g., interchangeable modular spreading systems for application of granulated mineral fertiliser, moist lime and dried poultry manure. This development caters for the wishes of a great number of large farms and contractors