Advantages of Reduced Tillage:

A Literature Review

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CONTENTS

ABBREVIATIONS

CA	Conservation agriculture
CRC	Crop residue cover
CT	Conservation tillage
CVT	Conventional tillage
DD	Direct drill
MNT	Minimum tillage
MT	Mulch-tillage
KZN	KwaZulu-Natal
NT	No-till
OM	Organic matter
RT	Reduced tillage
SOM	Soil organic matter
ST	Strip-tillage
VT	Vertical tillage

ABSTRACT

Tillage affects crop yields, establishment costs and speed, crop profitability, soil health, erosion, organic matter and nutrient cycling. In many areas of the world including South Africa crop production has changed or is changing from plough-based tillage to cheaper, more profitable and sustainable reduced tillage systems such as minimum, mulch, strip and no-till or conservation agriculture. In South Africa the transition was usually initially to chisel-based reduced tillage systems. A range of more sustainable no-till systems are used on more than 70% of the cropping area in Brazil, Argentina, Australia, Canada and the Western Cape as well as in KwaZulu-Natal. Reduced tillage is used widely in other provinces while no-till is being practiced on an increasing scale. The main reasons for the change to no-till-based systems are the lower tillage costs while maintaining or increasing crop yields and profitability. They also facilitate faster more timeous planting and require less labour, fuel, tractor power and maintenance. A wide range of modern no-till planters and associated equipment have been developed internationally and many are marketed locally. Better herbicides and herbicide resistant crops have made weed control easier. The retention of various levels of crop residue on the soil surface from harvest to after planting, together with minimum soil disturbance, are the two major factors contributing to successful conservation tillage or no-till. Adequate crop residue on the soil surface conserves more water in the soil as it improves infiltration, reduces runoff and wind and water erosion as well as evaporation. It also improves soil health, soil organic matter in the surface soil, soil structure, productivity, soil fertility, nutrient cycling and reduces soil compaction. Many farmers using appropriate, knowledge intensive, conservation tillage systems, are consistently producing top yields and profits. These systems, with crop residue retention on the soil surface, have many important off-farm benefits.

Keywords:
Conservation agriculture, conservation tillage, crop residue soil cover benefits, no-till, strip-till, tillage definitions, tillage practices.