

Weed Management GUIDELINES

CROP HANDBOOK

NEW HOLLAND

Weed Management

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Weeds

COMMON BROADLEAVES



Chenopodium Album







Solanum Nigrum



Ambrosia Artemisifolia

COMMON GRASSES



Polygonum Spp.



Eriochloa spp.



Panicum miliaceum

Alopecurus spp.





Digitaria spp.

Panicum spp.

Integrated Weed Management

USING DIFFERENT MEANS TO GET THE GOAL

- Weeds are an important limiting factor in farming. They compete with crops for space, water, nutrient, oxygen, light and CO₂.
- Presence of certain quantities of weeds can bring the yield near to 0, as showed in charts below.
- Weed control is thus one of the most important operation in farming. Integrated weed management uses several means in limiting the deleterious effects weeds have when growing with crops.

INTERFERENCE OF WEEDS WITH CROPS HOW MUCH DO WEEDS COST?



Crop Rotation

CROP ROTATION AS AN INTEGRATED MEAN TO CONTROL WEEDS

- Crop rotation allows a better weed management, because:
 - 1 Mechanical weeding is carried out in different seasons and with different working depth.
 - **2** Chemical weed control is carried out with different active ingredients and affects different weeds.
- As a result, weeds are not selected by resistance to certain herbicides or by crops, so formation of specialized weeds' population is hindered.
- At the contrary absence of rotation (monocropping, monocolture) make easy the formation of specialized weeds population, which gets very difficult to manage. In certain cases, cropping had to be suspended for 1 or 2 years.

A SYSTEM BASED ON AGRONOMY



CROP PROTECTION



CROP PROTECTION FOR BETTER CROPS AND HIGHER YIELDS



PLANTING



SEEDBED TILLAGE



Tillage

TILLAGE AS AN INTEGRATED MEAN TO CONTROL WEEDS

• Tillage is also a powerful mean in order to manage weed. Different tillage system and operation have different consequences on different groups of weeds, as showed in chart below.

TILLAGE SYSTEM	BIOLOGICAL WEEDS GROUPS			
	BIENNIALS OR PERENNIALS (VEGETATIVE PROPAGATION) E.G. CYNODON DACTYLON E.G. ARTEMISIA VULGARIS		ANNUALS (SEED PROPAGATION)	
		E.G. ARTEMISIA VULGARIS	RESISTANT SEEDS	WEAK SEEDS
PLOWING	۲	۲		۲
ACTIVE HARROWING			-	e
CHISELING	e	e	-	e
DISKING		e		e
NO TILLAGE				e
 Damaged groups Indiffer groups 	rent ə Favored groups			



Chemical Weed Control

HERBICIDES

Herbicides are often the primary tools of choice for weed management. Many different herbicides and herbicide formulations are commercially available, including soil-applied and foliar-applied products, selective and nonselective products, products with long soil persistence, and products with no soil residual activity. The selection of which herbicide to use should be based on multiple factors, including soils, cropping rotations, tillage practices, and weed species. Sole dependence on herbicides may not necessarily provide the most economical or sustainable weed management. Integrating multiple practices reduces the likelihood of poor weed control due to unfavourable environmental conditions and reduces the intensity of selection for herbicideresistant weeds.

NO AND MINIMUM TILLAGE

- Total herbicides are commonly used in Early Pre-Planting spraying in order to kill all the weed present on the field (burn up).
- Particularly no and minimum tillage are depending on correct weed management, because the presence of residue on soil surface make impossible or difficult applying several Pre-Planting and Pre-Emergence herbicides.
- Proper management of Post-Emergence herbicides becomes critical in no till system, because only these herbicides can be ever applied in no till conditions.



CROP GROWTH STAGE							
Crop is not presents, weed and residue are	Solid has been tilled, no crop planted	Crop seeds are planted but not emerged	Crop has emerged from soil				
TIMELINESS							
Early Pre-Planting with total foliar herbicides	Pre-Planting with selective soil applied residual herbicides	Pre-Emergence with selective soil applied herbicides	Post-Emergence with foliar herbicides and residual foliar herbicides				

Classification of herbicides on timeliness basis

SOIL APPLIED HERBICIDES PRINCIPLES OF SOIL-APPLIED HERBICIDES

Soil-applied herbicides remain an important part of weed management programs in several crops production systems. **Early Pre-Plant (EPP)**, **Pre-Plant (PP)** and **Pre-Emergence (PRE)** surface are the most common types of herbicide applications to soil.

Before planting or sowing, it is common practice to apply herbicides to soil. These herbicides have different ways of action against weeds: contact herbicides are absorbed by leaves of weeds, when residual herbicides are mostly absorbed by the roots of weeds.

Early Pre-Plant (EPP) and Pre-Plant (PP) herbicides non selective contact herbicides (glyphosate, glufosinateammonium) are applied on seedbeds to kill present weeds and get a clean start to crops. These herbicides are mostly, but not only used in no and minimum tillage patterns. Applications are carried out from several to one week before planting with volumes of about 50-200 liters of water per hectare. Pre-Emergence (PRE) surface herbicides are selective for the crop and are absorbed mainly from roots and other organs of weeds seedlings. Application is carried out after planting within a few days (the earlier the better). These herbicide for efficacy need a fine seedbed structure with little soil conglomerates and a sufficient moisture level in soil; such factors allow for diffusing into soil and form a film on soil surface. PRE herbicides can be applied on the whole surface of field or in bands along the rows of crops during the sowing. In this case, the interrow spaces will be tilled or sprayed after the emergence of the crop. In any case, the most common methods for herbicides to become dissolved into the soil solution are precipitations or irrigation. If moisture in soil is not sufficient, Pre-Emergence soil applied herbicides do not provide a consistent weed control.

POST-EMERGENCE HERBICIDES PRINCIPLES OF POST-EMERGENCE HERBICIDES

Post-Emergence herbicides are a key part of an integrated weed management program. Applications made after crops and weeds have emerged with selective and residual contact herbicides, thus allowing for control of already present weeds and weeds' seedlings. PE herbicides have some advantages: it is possible

- to choose the herbicides in function of the weeds actually present on the field after identifying the weed species
- to apply herbicides in the very early stages of weed growth, thus decreasing the rates of applications
- to add additives to herbicides (surfactants and the such) in order to decrease the rates of application
- to minimize the interactions of the herbicide with factors associated with soil (such as texture and organic matter content).

To achieve weed control with post-Emergence herbicides, the herbicide must come in contact with the target, be retained on the leaf surface prior to absorption into the plant, be able to reach the site of action within the plant, and finally induce some phytotoxic response. Plants and weeds too, have a wax cuticle, which is a protection for leaves and decreases the amount of lost water. When PE herbicides are applied, it is necessary to add to the mix additives, which improve the penetration of chemicals through the cuticle. Older plants and plants under environmental stress generally have more wax or a different structure of the wax comprising their cuticles and are thus more difficult to wet. Younger, smaller plants usually absorb herbicide more rapidly than older, more mature plants.



Final Considerations

- It is very difficult, if not impossible, to set a specific weed-free interval that is acceptable with all species and across all locations and years. Local conditions are a great factor of variability.
- It is difficult to set specific intervals that will be valid over widely diverse conditions, in order to determine how long weeds can remain in the crop and eventually be removed with no resultant deleterious effects on quantity and quality of crop yield.



Machinery

IMPLEMENTING YOUR GROWTH PROJECTS

Crop producers know that their soil is the most precious natural resource, and better soil conditions mean higher crop yields. New Holland knows that every individual plant counts towards your bottom line and that's why we design our equipment specifically to help you maximize yield potential.



TILLAGE & TRACTORS

Tillage is still a powerful mean in weed control and it fits very well in an integrated weed control system. For consistent tillage, we need tools and tractors. New Holland Agriculture has a huge delegacy in designing and manufacturing tractors for any need. T6, T7, T8 and T9 tractor series deliver power from 150 up to 620hp, thus answering any tillage challenge, from classical moulboard ploughing, to secondary tillage and seed bed finishing up to minimum tillage on any acreages.

In many Asia pacific regions, plough is still the main implement for primary tillage.

New Holland tractors are equipped with features designed for demanding conditions and tillage operations also in flooded conditions.

GUARDIAN SELF-PROPELLED SPRAYERS

It's all about doing more with less time. **Guardian™** front-boom sprayers cover ground faster, reduce downtime and maximize acres sprayed per hour. These sprayers offer the highest horsepower, largest tank size, and the smoothest suspension combined with the highest ground clearance and the tightest turning radius in the industry to maximize your spraying productivity and quality.





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