

Wheat and Barley

PRODUCTION GUIDELINES



CROP HANDBOOK

Wheat and Barley

| | |
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Statistic

TOP WHEAT PRODUCERS (IN MILLION METRIC TONS)

| RANK | COUNTRY | 2010 | 2011 | 2012 | 2013 |
|------|-----------------------|------------|------------|------------|------------|
| 1 | China | 115 | 117 | 126 | 122 |
| 2 | India | 80 | 86 | 95 | 94 |
| 3 | United States | 60 | 54 | 62 | 58 |
| 4 | Russia | 41 | 56 | 38 | 52 |
| 5 | France | 40 | 38 | 40 | 39 |
| 6 | Canada | 23 | 25 | 27 | 38 |
| 7 | Germany | 24 | 22 | 22 | 25 |
| 8 | Pakistan | 23 | 25 | 24 | 24 |
| 9 | Australia | 22 | 27 | 30 | 23 |
| 10 | Turkey | 19 | 21 | 20 | 22 |
| 11 | Ukraine | 16 | 22 | 16 | 23 |
| 12 | Iran | 13 | 13 | 14 | 14 |
| 13 | Kazakhstan | 9 | 22 | 13 | 14 |
| 14 | United Kingdom | 14 | 15 | 13 | 12 |
| 15 | Poland | 9 | 9 | 9 | 9 |
| | World | 651 | 704 | 675 | 713 |

Source: **Un Food & Agriculture Organization**



Production Guidelines

| | WHEAT | BARLEY |
|--|--|--|
| OPERATIONS | AGRONOMICS AND TIMING | AGRONOMICS AND TIMING |
| Crop rotation | After sugar beet, soybeans, corn for silage. Turning 2 years | After sugar beet, soybeans, corn for silage. Turning 2 years |
| Primary tillage | Minimum tillage (max 15cm) <ul style="list-style-type: none"> • Plough • Chisel • Heavy cultivator Or sod seeding | Minimum tillage (max 15cm) <ul style="list-style-type: none"> • Plough • Chisel • Heavy cultivator Or sod seeding |
| Secondary tillage | Harrows, spyr harrows, light field cultivators | Harrows, spyr harrows, light field cultivators |
| Drilling (Northern Hemisphere) | | |
| Timing | Winter wheat: from beginning September end of October Spring wheat: April to end of May Min. germination T 4-5°C | Winter barley: from 15 September to middle of November Spring barley: mid February to beginning of May Min. germination T 4-5°C |
| Population at harvest | 550-700 ears per square meter | 600 ears per square meter |
| Distance between rows | 18-33 | 18-33 |
| Quantity of seeds | 350-500 grains/square meter (150-250kg/ha) weight of 1000 seeds 30-55grms | 300 grains/square meter (130-170kg/ha): weight of 1000 grain 40-55grams |
| Depth | 3-4cm | 2-3cm |
| Fertilizing (Guidelines, to be adjusted on soil analysis base) | | |
| Nitrogen (N kg/ha) | 50-80 at tillering, then 70-90 at the beginning of jointing | 80-100 top fertilization |
| Phosphorus (P ₂ O ₅ kg/ha) | 70 at planting or before 0 in soils with normal content of P (>30ppm) | 70 at planting or before 0 in soils with normal content of P |
| Potassium (K ₂ O kg/ha) | 0 in good soils (K>100ppm) 60 in soils with (K<100ppm) | 0 in good soils 60 in soils with P<100ppm |
| Weed control | | |
| Minimum tillage: | Before emergence and Post emergence | Before emergence and Post emergence |
| Sod seeding | Glyphosate before sowing: post emergence as usual | Glyphosate before sowing: post emergence as usual |
| Pest control | Spraying | Spraying |
| Harvesting | When grain moisture is about 13% | Grain moisture 13% |

DROPLET SIZES FOR DIFFERENT CHEMICALS

| ASABE STANDARD S-572.1 DROPLET SPECTRUM CATEGORIES ^{1,2} | CONTACT INSECTICIDE AND FUNGICIDE | SYSTEMIC INSECTICIDE AND FUNGICIDE | CONTACT FOLIAR HERBICIDE | SYSTEMIC FOLIAR HERBICIDE | SOIL-APPLIED HERBICIDE | INCORPORATED SOIL-APPLIED HERBICIDE | RELATIVE SIZE | COMPARATIVE SIZE | ATOMIZATION |
|---|-----------------------------------|------------------------------------|--------------------------|---------------------------|------------------------|-------------------------------------|---------------|--------------------------------|--------------|
| VERY FINE (VF) RED | | | | | | | | Point of Needle (25 microns) | Fog |
| FINE (F) ORANGE | ✓ | | | | | | | Human Hair (100 microns) | Fine mist |
| MEDIUM (M) YELLOW | ✓ | ✓ | ✓ | ✓ | | | | Sewing Thread (150 microns) | Fine Drizzle |
| COARSE (C) BLUE | | ✓ | | ✓ | ✓ | ✓ | | Stamp (420 microns) | Light Rain |
| VERY COARSE (VC) GREEN | | | | ✓ | ✓ | ✓ | | Stamp (420 microns) | Light Rain |
| EXTREMELY COARSE (XC) WHITE | | | | | | ✓ | | #2 Pencil Lead (2,000 microns) | Thunderstorm |

Droplet sizes are suggestions for each pesticide. ¹ Based on VDO.5, the Volume Master Diameter (VMD) designation. Source: Kansas City University.

² Revision of Stantard S-572.1 also includes extra-fine and ultra-coarse categories for non agricultural users.

This droplet guide summarizes suggested droplet sizes for a variety of chemicals, based on the ASABE standard droplet spectrum categories.

Crop Rotation - Crop Development

WHY IS IT IMPORTANT?

- As a Rule, **Crop Rotation** practices improve the performances of crops
- By varying crops in the same season, farmers can spread equipment demand throughout the season, reducing costs while increasing utilization.
- **Exploitation of soil** fertility is improved, as different crops roots explore different layers of soil and use different nutrients.
- **Structure of soils improves**, because residues from crop roots stay at different depths and residues are also different.
- **Management of weeds, pests, and diseases** is easier when utilizing a crop rotation we can reduce chemical useage and losses. Crop specific diseases and pests are reduced or eliminated by the crop rotation because they are not provided with a regular food source.
- **Fallow / Set Aside** is a practice still utilized in many areas of dry wheat cropping which enters in crop rotation. Used for large land area farms, and where chemicals are not available and there is limited moisture. Land is "resting" and planting is skipped to restore Organic Matter and moisture. It is used on maximum 20% Acreage.
- Best crop before wheat and barley are soybeans, peas, sunflower, canola and sugarbeet, because wheat can take advantage of residual fertilization and deeper tillage from the previous crops. Wheat and barley should not be re-planted the second year, to avoid problems with fungi diseases and insects. A minimum period of 2 years is recommended between two wheat crops. Both wheat and barley are outstanding prior crops before tomatoes, potatoes, sunflower, corn and soybeans.

A SYSTEM BASED ON AGRONOMY

HARVEST



RESIDUE MANAGEMENT



CROP PROTECTION



PRIMARY TILLAGE



**BETTER CROPS,
HIGHER YIELDS**

PLANTING

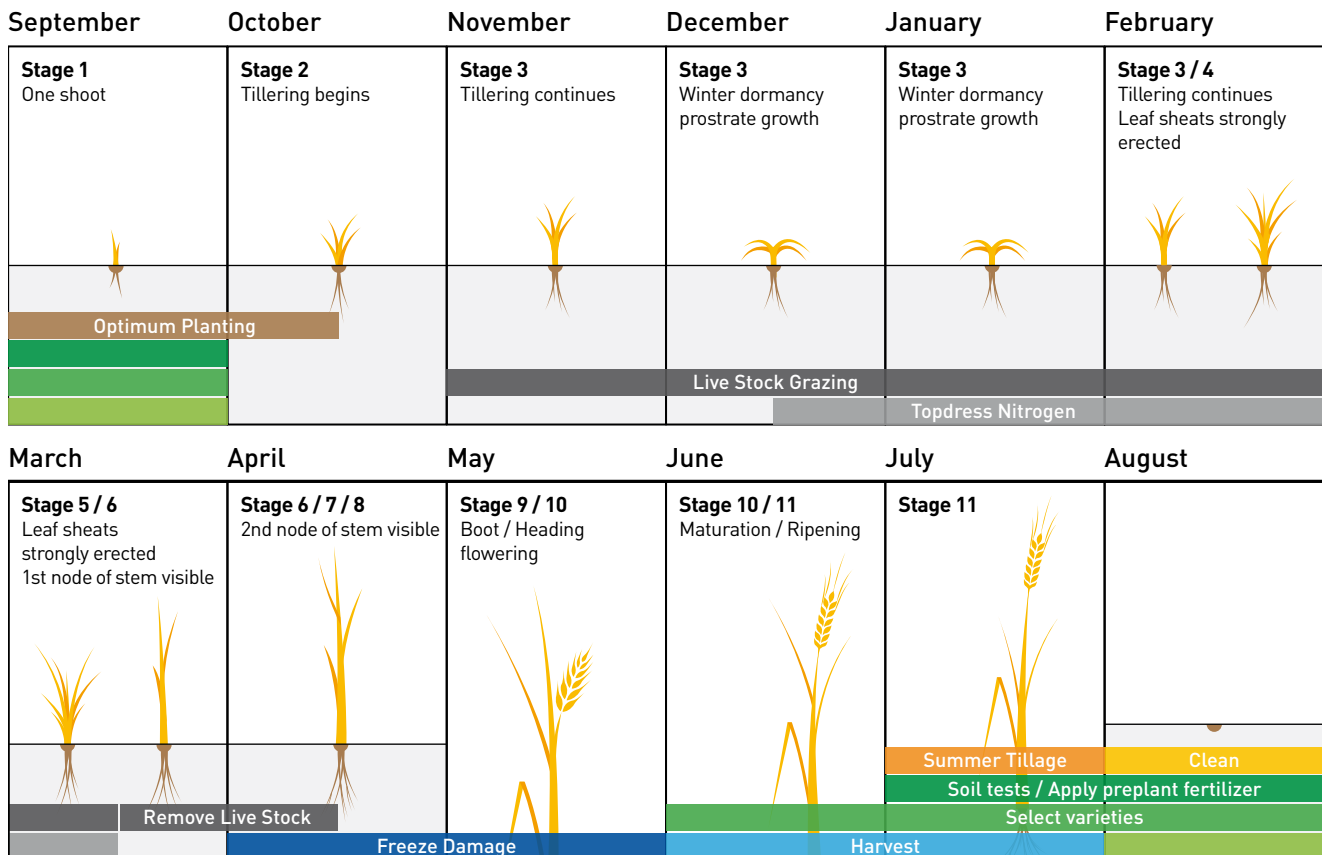


SEEDBED TILLAGE

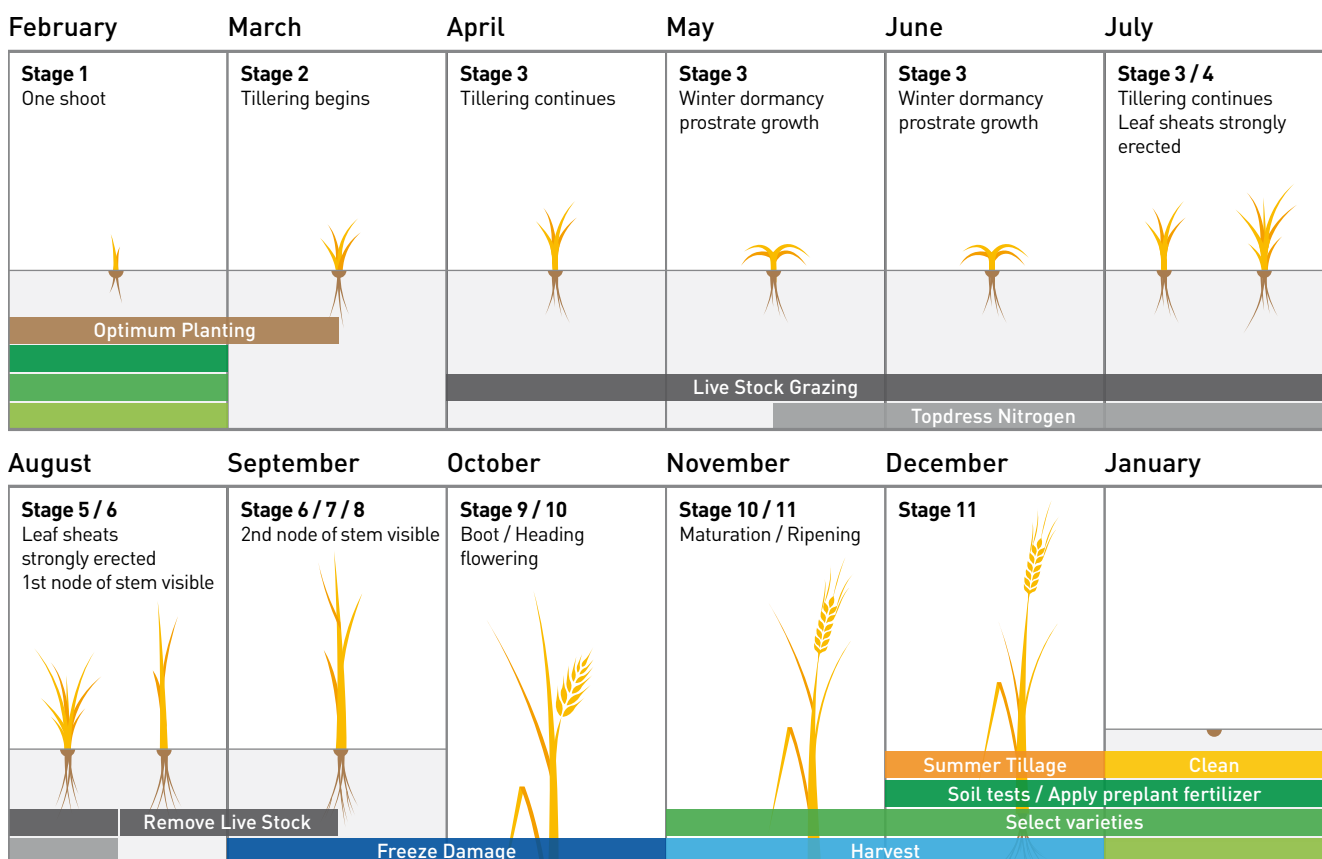


WHEAT PRODUCTION CALENDAR

NORTHERN HEMISPHERE



SOUTHERN HEMISPHERE



Tillage

FOREWORD

- Both for winter and spring cereals the trend is to decrease the depth and the number of tillage operations. Patterns of minimum tillage and no tillage are nowadays rather common.
- Suggested patterns are:
 - **Minimum tillage, at a depth of 10-15 centimetres**
 - **No tillage, or sod seeding: no tillage is performed before the drilling**
 - **Conventional tillage using a disk ripper at 20-25 centimetres of depth. This operation is normally performed for others crops (corn, sunflower, sugarbeet) but the re-structuring of soil is beneficial for all the crops in rotation**

The general rule is not to till too deep, in order to spare fuel, time, work and passes, therefore avoiding soil compaction. On large acreages very efficient implements are applied, whose productivity may reach hundreds of hectares per day.

An alternative to the disk ripper is the reversible mouldboard, with working width from 3 up to 13 bodies (1.5- 6.5 meters). In this case, the seedbed finishing is performed in a second pass with harrows.

PRIMARY AND SECONDARY

- Primary Tillage should begin directly after the combine.
- A wide choice of tools are available for primary tillage
 - Moldboard plow
 - Chisel plows
 - Disk rippers
 - Offset disk
 - Tandem disks
- Secondary Tillage is carried out before drilling. The goal is to achieve a proper seedbed, which means soil particles of right size for good contact between seeds and soil. Right size is between 2-5mm.
- Soil with a rough surface hinders proper seed germination and plant growth, ultimately leading to lost potential yield.
- Large soil clods can cause drills to bounce. This makes it challenging to control planter depth and maintain seed placement accuracy for uniform plant spacing. This is an issue in conventional tillage, but is not a problem in Minimum Tillage.

- Different heights in the soil surface result in variable moisture and temperature levels.
- A good seed bed is important because it aids the plant in developing strong roots and provides access to water, oxygen, and nutrients.
- The right soil-air-water balance helps plants to establish strong root structure which, among other effects:
 - Limits plant stress during drought periods
 - Improves plant water and soil utilization
 - Improves crop anchorage
- Wheat requires good seed-to-soil contact and moderate soil moisture for germination and emergence. Generally, one or two passes with a disk harrow or soil finisher will produce an adequate seedbed if the soil is not too wet.
- It is better to wait until the soil dries sufficiently before preparing it for wheat, even if that means planting is delayed.



PONDING

MISCONCEPTION: PONDING IS A RESULT OF TOO MUCH RAINFALL

Not necessarily. Usually ponding is a result of poorly managed soil. When soil is compacted, it cannot absorb water. Compacted soil is like a sponge that is squeezed tight: there is no space for air and water. To make matters worse, compacted soil forms an impenetrable layer that prevents excess water from draining through. The result is ponding.

MINIMUM TILLAGE

FACTS

- **Minimum tillage** avoids primary tillage and substitutes it with other patterns which are swifter and cheaper.
- It is mostly carried out on large farms, where in short periods of time large surfaces must be cropped.
- **Minimum tillage reduces moisture losses**, which is of paramount importance in places with dry conditions where irrigation is necessary
- Less passes in minimum tillage patterns reduces the working days needed for preparation and cultivation. This increases equipment and labor utilization
- on large acreage farms when compared with conventional patterns
- Substantial **reductions in costs for fuel and labor** are possible
- The reduction of passes across the field **improves the soil structure and a reduces soil compaction**
- **Protection against wind and water** erosion increases
- Special equipment is available to complete minimum tillage and drilling in one pass

MINIMUM TILLAGE MEANS EFFICIENT TILLAGE, DRILLING, SPRAYING AND COMBINING

- With less tillage, weed control becomes more dependent on herbicides. However, effective herbicides are available for controlling most weeds in conservation tillage systems. Herbicide selection, application rate, accuracy, and timing become more important.
- Application accuracy is especially important with drilled crops like wheat or other cereals because in-row cultivation becomes difficult or impossible.





ENGAGING TOOLS

Sweeps are often the first step in Minimum Tillage when chemical control of weeds is a major concern. When utilizing Sweeps, the seeds and fertilizer are introduced together (single shoot). The sweeps scrape the surface of the ground removing much of the surface mass of rooted weeds.

- Promotes good weed control where the use of herbicides is a concern
- Yields higher losses of moisture when compared to other openers, but less than compared to conventional tillage

Rate of Nitrogen must not be excessive (<40kg/Ha) at sowing to avoid burning the seeds.
Rates of Phosphate and Potassium are no concern.

MINIMUM TILLAGE WITH SWEEPS

2007 Spring Wheat Result: First year of minimum tillage in Central Russia



IDEAL. Thick crop mat with little visible soil.



ADEQUATE. Some visible soil, but plant is healthy.



POOR. Two mistakes were made during drilling:

- **first**, the Sweeps were buried too deep in the ground. The Wheat coleoptile only has enough energy to grow limited height. If the seed is planted too deep, the plant uses too much energy trying to breach the surface and does not have the nutrients left to form a healthy root or stalk.
- **second**, the drilling was performed when the moisture content of the soil was too high. When moisture content is high, seeds stick in the ground and do not spread uniformly across the field.

Seeding - Drilling

Timing of drilling varies depending on latitude. For example, for winter wheat, in APAC region sowing begins at the end of August (Central Russia) up to end of September. For spring wheat, commonly the sowing is at the end of April- middle May.

| | Soft Wheat | Hard Wheat | Barley |
|-------------------------------------|-------------------|-------------------|---------------|
| Timing | September | September | October |
| Ears at harvesting per square meter | 700 | 550 | 600 |
| Seeds per square meter | 500 | 450 | 200-300 |

In order to perform a consistent sowing, it is necessary to know the weight of 1000 seeds and their germination rate. The seeds rate varies from 180 up to 250 kg per hectare. Seeds' dressing with fungicides is mandatory.



SOD SEEDING

- **Sod seeding allows a huge fuel economy improvement** when compared with traditional seeding patterns. If properly carried out with proper machinery, a 50% reduction of costs is possible.
- **Sod seeding** is adept in managing limited water resources, allowing a more strict management of soil moisture and keeping all the advantages of minimum tillage
- **Weed seeds** are not turned up to surface every year, as in ploughing. This helps to decrease the number of weeds per square meter
- **Organic matter** is not incorporated in all the layer of soil, but only in surface layers. This improves the soil structure of upper layers where the seed is first drilled: an important part of residues remains on surface, which seriously decreases damages from water and wind erosion
- **The practice** of sod seeding requires the proper use of machinery in the full harvesting process. Either combines must be equipped with straw choppers or a baler must follow the combine to remove the straw from the fields
- Maintaining a **consistent structure** of soils and fields is a requirement for sod seeding



A possible configuration: single pass and four operations



A different configuration same results: four operations in one pass

Special pieces of machinery are required for sod seeding. Initial costs are higher compared to other mechanized solutions, but the result will increase profits and decrease costs over the lifetime of the equipment (Fuel, Maintenance, Labour). Larger acreages can be properly managed.

MACHINERY & LOGISTICS



Seeds and fertilizers are loaded into the Air Cart during drilling. **Efficient logistics** are fundamental in improving drill productivity and overall results on large areas.



Drill: **sweeps or openers** can be used for Wheat depending on which level of weed control is required and the availability of herbicides. Sweep are more efficient in controlling weeds: openers are more precise concerning seeding depth.

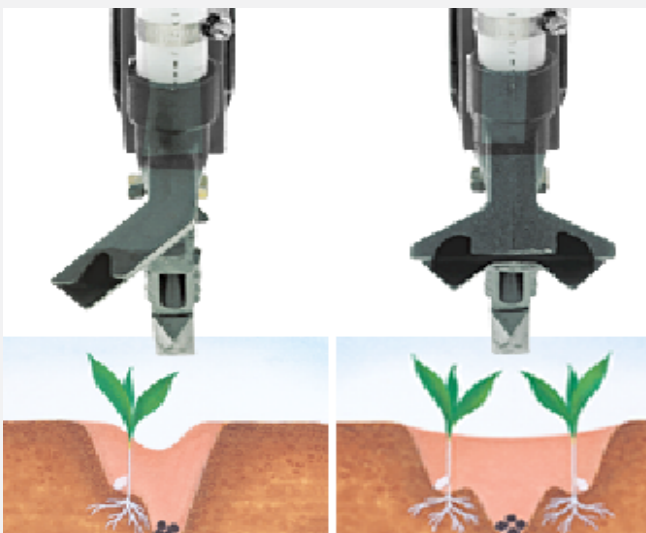
STEALTH GROUND ENGAGING TOOLS

Sod seeding PROS:

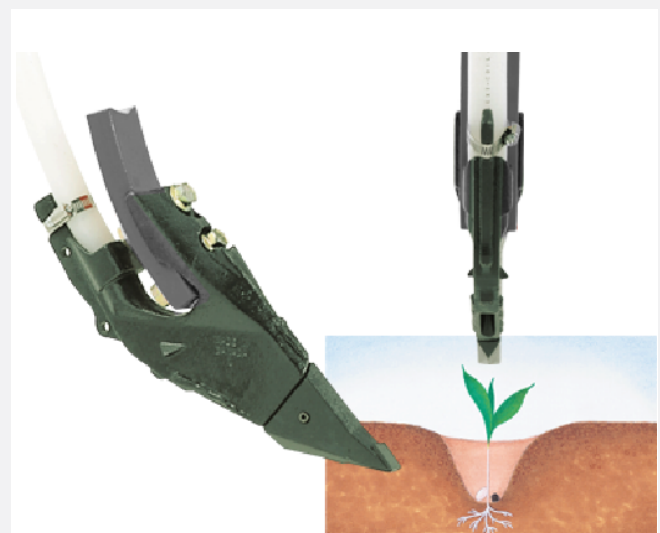
- Minimal moisture losses
- Minimal soil disturbance

Sod seeding CONS:

- Poor weed control



Double Shoot: Seeds and fertilizer are drilled separately. Slightly higher initial cost, but allows the independent control of fertilizer applications (N) reducing fertilizer costs and increasing yield potential.



Single Shoot: Seeds and fertilizer are applied at a constant ratio with no control over fertilizer applications. Slightly lower initial cost, but higher lifetime cost due to effects of under/overfertilizing.

Tip and body opener: there is a large choice of tips, depending on width of rows and spacing.

DRILLING

UNIFORMITY IS EVERYTHING

- The Wheat seed germination process begins when the seed first absorbs water and oxygen.
 - Adequate soil moisture and temperature are necessary for the start of germination.
- There are 4 important parts of a wheat seedling:
 - The **embryo**, or “germ,” which gives rise to the radicle, or the seedling root.
 - The **endosperm**, which contains the necessary plant foods (starches and proteins) for the germination and emergency process.
 - The **scutellum**, or the first leaf.
 - The **coleoptile**, or second leaf. The coleoptile penetrates the soil within 5 to 7 days after planting.
- If the seed is planted **too deeply**, beyond the elongation distance of the coleoptile, seedlings cannot emerge and a poor stand will occur.
- Semi-dwarf wheat varieties form short coleoptiles as well as short plants. **Planting depth is then especially** critical for semi-dwarf wheat varieties.

FIVE PRIMARY AGRONOMIC FACTORS OF SEED PLACEMENT ACCURACY

- **A firm seedbed assures good contact between the seed and the soil.** Though this is less critical for wheat when compared to corn or sugarbeet, uniformity in wheat emergence is still an important factor for producing high yields.
- **Plants that emerge uniformly** and progress at the same rate of development throughout the growing season, deliver improved yield potential.
 - Uneven emergence introduces inefficiencies and added competition within the stand.
 - Uniformity in the ripening process reduces harvesting problems
- **Treating wheat seeds** with the proper fungicide or mixture of fungicides is an inexpensive way to help ensure improved stands and better seed quality.
 - Can be purchased from the seed provider or performed on the farm.

EMERGENCE

- **Early, even emergence** is one of the most critical elements to attaining maximum yield potential from all crops. The sooner the plant gets out of the ground, the sooner it can develop a more advanced root system and leaf stage to fight off stress factors that are sure to come its way.
- **The sooner plants get out of soil**, the less they will be damaged by soil pests. Also, fast emergence is a good way to avoid fungal damage
- A stand of **300-350 plants per square meter** is generally considered optimal
- A minimum of **150-200 healthy plants per square meter** is needed to justify keeping a field in the spring. If plants are weakened by winter weather and tiller numbers are low, then even 220 or 270 plants per square meter might not maximize yield.
- At harvesting, a stand of 550 (durum wheat) and 700 (soft wheat) ears per square meter is considered optimal.

BEFORE THE DRILLING TOTAL AREA ABOUT 4.000 HECTARES (9.885 ACRES)



What is the cost to Plough, Harrow, Fertilize, and Drill 4000Ha?

AFTER THE FIRST DAYS OF DRILLING GOOD JOB ALREADY IN FIRST YEAR 2014 CENTRAL RUSSIA



In this example: utilization of No-Till has reduced fuel costs from about 50 liters per hectare to about 12 liters per hectare. Yield during the first year is expect to fall between -5% to +5% of average depending on conditions. Conditions include: Weather, Weeds, Fertilizers

NO TILLAGE (NO-TILL)

No Tillage is a practice promotes no disturbance of soil resulting in the least moisture losses of any tillage practice. No-Til is carried out using only an opener (knife) or disks drills.



The P2080 and P2085 family of air drills feature a parallel-link system, consisting of an upper and lower arm to ensure even depth placement across varying soil conditions. Patent-pending variable down-pressure springs apply the right amount of pressure on individual row units to ensure better penetration across varying residue and soil conditions.

Fertilization

In modern farming fertilizers have been used in large quantities (up to 200 kg N per hectare): the trend is nowadays to apply fertilizers on the basis of soil analysis and considering the need

for fertilizers on the base of a realistic yield, also because of the importance of avoiding pollution of surface and soil waters with excessive fertilizers' applications.

Different researches have shown that a yield of **wheat** of 7 tons per hectare removes on average:

- **N** 150-180 kg per hectare
- **P₂O₅** 60-70 kg per hectare
- **K₂O** 90 kg per hectare.

A yield of 7 tons per hectare of **barley** removes on average:

- **N** 160 kg per hectare
- **P₂O₅** 68 kg per hectare
- **K₂O** 121 kg per hectare.



Liquid fertilization can be carried out using sprayers

A POSSIBLE FERTILIZATION PLAN FOR WHEAT IS:

| Element | At Drilling | At Tillering | At Jointing |
|--|-------------|--------------|-------------|
| Nitrogen (N) | - | 50-80 | 70-90 |
| Phosphorus (P₂O₅) | 0-70* | - | - |
| Potash (K₂O): | 0** | - | - |

Note:

* The higher rate is for soils poor in P (P Olsen below 10 ppm): no fertilization is needed in rich soils (P Olsen above 20 ppm)

** Only in deficient soils (K below 100 ppm) apply before drilling 60 kg per hectare.

- **Nitrogen (N):** optimum rate is about 150 kg per hectare. This rate can be increased in the case of incessant rain or decreased in case of drought. N is applied in two times, first before tillering and then at the beginning of jointing. Urea or similar fertilizers are best choice.
- **Phosphorus (P₂O₅):** in deficient soils, the rate suggested is 70 kg per hectare, before the drilling or at the drilling.
- **Potash (K₂O):** when necessary, the fertilizer is applied before the drilling.

FOR BARLEY:

| Element | At Drilling | Tillering-Jointing |
|--|-------------|--------------------|
| Nitrogen (N) | - | 80-100 |
| Phosphorus (P₂O₅) | 0-70* | - |
| Potash (K₂O): | 0** | - |

Note:

* The higher rate is for soils poor in P (P Olsen below 10 ppm): no fertilization is needed in soils rich in P (P Olsen above 20 ppm)

** Only in deficient soils (K below 100 ppm) apply in pre-sowing 60 kg per hectare.

- **Nitrogen (N):** barley is more hardy than wheat, so a rate of N at 90 kg per hectare is considered sufficient. One application in the middle of tillering period is suggested.
- **Phosphorus (P₂O₅):** in poor soils the rate suggested is 70 kg per hectare, applied before the sowing or at the sowing.
- **Potash (K₂O):** when necessary, the fertilizer is applied before the drilling.

Crop Protection

WEEDS

Agronomic researches focus on integrated pest management and lesser use of chemicals: nevertheless, crop protection by spraying herbicides, insecticides and fungicides is still necessary. Farming of wheat and barley allows for control of broadleaf weeds with hormonal herbicides as 2,4D, MCPA, MCPP and others. Both pre-emergence and

post-emergence treatments are possible. When sod seeding is practiced, a pre sowing treatment with total herbicide is common. Pre-emergence herbicides are applied immediately after the drilling. Post-emergence herbicides are applied at the stage of tillering until beginning of jointing.



Giant ragweed



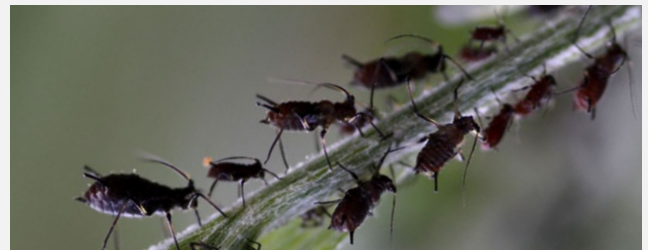
Lambsquarters



Velvetleaf

INSECTS

Several insects attack wheat during the farming season. Agronomic practices as crop rotation, seeds' drilling and sowing of resistant varieties can decrease the pressure of pests on the crops. Nevertheless, often it is necessary to apply chemicals on top. For example, the presence of 5 Aphids per plant means a treatment with insecticides is needed.



Aphis fabae

FUNGI

FUSARIUM SPP.

- Stem rot is controlled by dressing seeds with TMTD or similar fungicides and rotating crops.

ERISIPHE GRAMINIS

- Mildew can severely damage the crop. Best choice is to grow resistant varieties.

PUCCINIA SPP. E SEPTORIA SPP.

- Black rust and leaf blotch are controlled using resistant varieties.

In order to obtain high yields, nevertheless is often necessary spraying crops with fungicides.

SPRAYING

FACTS

- **Crop protection** is indispensable in modern agriculture.
- **When spraying is needed**, timeliness is more crucial than in other operations. Weeds and pests are to be hit in right time, with right rates of chemicals and every time it's needed.
- **Time of weed emergence relative** to crop emergence has a tremendous influence on competition and yield reduction caused by weeds. Weeds that emerge with the wheat crop or early in the season are more competitive with wheat than weeds that emerge later in the season.
- **Pest control** is often needed through top spraying.
- **Productivity and reliability of sprayers** are important factors affecting the result of spraying operations. Accurate application rate of chemicals and their cost imposes precision in spraying.
- **Uniformity an size of droplets** allow proper effect on pests an consistent crop coverage, depending on what we are spraying for.
- **Adjustments** of pressure and volume are required depending on what the target is (weeds, fungi, insects). Drift control is another important factor.



TOOLS

Flexibility, accuracy, timeliness and reliability on different crops.

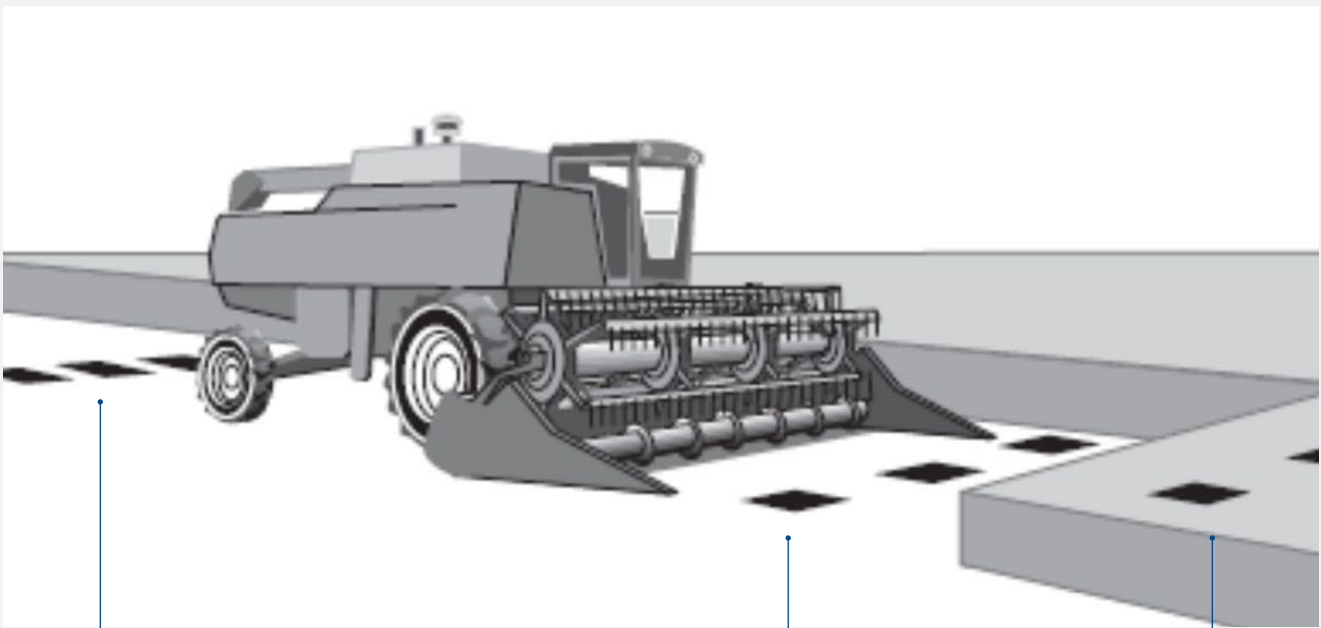


Uniformity droplets are important to achieve desired results depending on pests.

Harvesting

In order to perform a consistent sowing, it is necessary to know the weight of 1000 seeds and their germination rate. The seeds rate varies from 180 up to 250 kg per hectare. Seeds' dressing with fungicides is mandatory.

- Grain moisture is about 13%, straw is completely dried up.
- Wheat headers, rigid or flexible or draper can be used to reap wheat.



**Check separator
loss here**

**Check header
loss here**

**Check preharvest
loss here**

**DRAPER HEADER;
RIGID AND FLEX**



**RIGID HEADER HIGH
AND EXTRA CAPACITY**



HEAVY DUTY VARYFEED



Overview

Wheat and Barley

| | PLANTING & DRILLING | SPRAYING |
|-----------------------------|--|-----------------|
| CONSERVATION TILLAGE | AIR Drills | MILLER Sprayers |
| CONVENTIONAL TILLAGE | AIR Drills | MILLER Sprayers |
| MINIMUM TILLAGE | Flexicoil 5000 HD + Air Cart Flexicoil 5500 HD + Air Cart | MILLER Sprayers |
| NO TILLAGE | P2080 e P2085 Disk Drills | MILLER Sprayers |

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.



GUARDIAN™ FRONT BOOM SPRAYERS

Very likely to other crops, cereals need an accurate protection, especially when minimum and no till systems are applied. The cab-forward, rear-engine design, front boom of New Holland Guardian sprayers provides equal weight distribution across the machine to get operators into fields earlier for more timely application with less rutting and soil compaction. When you are working, you don't need watch behind.



40 & 50 SERIES AIR CART

New Holland air carts have proven to be highly precise seed and fertilizers systems. Precise rates of seed and fertilizers are delivered there where they must. When minimum tillage systems are applied, New Holland seeding equipment is an outstanding means to improve both technical & economic goals all around the world, as experience showed.



5000HD AND 5500 AIR DRILL

New Holland Hoe Drills and precision hoe drills deliver precise seed and fertilizer placement, making it ideal for seeding different crops on large acreages. A large choice of seeding systems is available (sweeps, openers, knives) as well as fertilization options (single shot or double shot), in order to match agronomical and economic needs of our Customers.



NEW HOLLAND HARVESTING

New Holland TC, CX and CR combine series offer a huge choice in harvesting options.

The great New Holland heritage in building combines allows for delivering reliable machinery, starting with simple drum and straw-walker classic TC combines up to sophisticated twin rotor CR extra powerful series. Residue management gets easy with straw choppers and chaff blowers standard on New Holland machinery. But not in every area direct combining is possible: if swathing is needed, windrowers can deliver an outstanding job (below).



NEW HOLLAND BALERS

Straw is often a handy commodity, used for many goals. New Holland balers have a great heritage in reliability and efficiency, starting with square balers up to the big balers series.





AT YOUR OWN DEALER



Visit our website: www.newholland.com
Send us an e-mail: international@newholland.com



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