



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ



Inovace studijních programů AF a ZF MENDELU
směřující k vytvoření mezioborové integrace
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**Tato prezentace je spolufinancovaná z Evropského sociálního fondu
a státního rozpočtu České republiky**

Use of nonwoven fabrics in greengrocery

Nonwoven fabrics

- Polypropylene fibres (PF)
thermally bonded
- Environmentally friendly
- Stabilized/unstabilized against UV radiations
- Raw material: LDPE – granules melt at 1,000°C, fibres are pulled and then compressed
- 90% of production are unstabilized fabrics – diapers, industry
- Only 10% are for agriculture - should be stabilized against UV radiation, otherwise after they are destructed within 14 days (foils must bear a printing, e.g. PEGAS AGRO 17 UV)

- Stabilization against UV radiation lasts 4 rotations:
 - 2 years, with 2 cultures per year

- The widest roll is 3.2m; on larger areas, rolls are glued together by the producer
(e.g. 16m roll, roll contains up to 1,000m)
- 10 ha of radishes covered with NF may be cultivated:
 - Harvested 10 days earlier, which saves 1 CZK per bundle
 - 1m² provides 20 bunches, i.e. 20 CZK.m⁻²
- Weight: 17/30/50g.m⁻²

Producers and trademarks of nonwoven fabrics

Pegas Agro

- Most common in CR, the cheapest
- Agryl (Novagryl)
- Germany –first in CR
 - On the edges of rolls, there is a string pressed to the fabric, so it is easier to grasp it during instalment; higher price (9 CZK.m-2)

Gromax



Types of nonwoven fabrics

Polypropylene (PP) nonwoven fabrics UV

17

- White
- Weight 17 g/m²
- Thinnest (5 CZK.m⁻², incl. VAT)
- Stabilized against UV radiation
- 1.6 or 3.2m wide
- Glued together, up to 16m wide
- Covering of stands
- Keeps moisture, prevents pest infestation
- May be reused



PP nonwoven fabrics UV 30

- White
- Weight 30g.m²
- Stabilized against UV radiation
- 1.6 or 3.2 m wide
- Glued according to buyer's requirements
- Only for winter crops
- Covering of sands during autumn for overwintering to prevent crops from being eaten by animals – Savoy cabbage for overwintering ARKTA, lettuce for overwintering
- May be reused



PP nonwoven fabrics UV 50 • black, for mulching

- Weight 50g.m-2
- Stabilized against UV radiation
- 1.6 or 3.2m wide
- Mulching
- all vegetables need softening
 - Bell peppers do not grow below black foil at all (!) - Long vegetation period, need lot of air, stripes between rows at most; necessary to hoe around plants
- Ideal: lettuce does not have to be hoed
- Vegetation period: 2 months
- Strawberry



Practical principles for use

- Fabrics must be anchored around the whole perimeter – rabbits may get under it, wind might take it away
 - Iron pipes or stones on edges, or soil
 - Make a furrow, install fabric, and tractor with plough will cover it with soil
 - Wind is dangerous during installing - NF with a string do not fly away so much
- May be used 4x in 2 years (2x per one year)
- After use, let it dry to avoid mould

- There is no difference between new foil and used foil (2-year); rodents are the biggest danger – mice
 - Store in shed over winter – mice chew, reproduce in it -> put the fabric into a plastic bag and hang on the ceiling (!)

Advantages of NF use

1. Bigger harvest –necessary to timely remove the NF
 - Lettuce heads will be open, if NF covers lettuce till harvest (remove it 14 days before harvest!)
 - Exception: kohlrabi – fabric can stay until harvest
2. Higher quality - maturing, colouring, less pollution
3. Acceleration of the harvest by 7-10 days, max. 14 days (1 week means 1CZK per 1 head)
4. Better use of land – earlier harvest, other cultures may be planted earlier, too

5. Protection against pests – the most important aspect (!) – most of pests are flying – they attack from air - protection, insecticides are harmful - reduction or elimination of chemical preparations

6. Protection against weed (mulching foil)

7. Less irrigation (amount and number of watering)

- Need of irrigation is reduced min. to $\frac{1}{2}$

- Below fabric – harmful vapour is significantly lower

(Bell pepper with mulch material easily lasts a week without watering; strawberries)

8. Protection against frost –
difference between covered and uncovered
stand is max. 1.5–1.7°C
(NF does not protect against freezing in
March, when temp. ranges between -5 and
-7°C)
9. Protection against hail (lettuce will
fall apart without fabric)

Protection against pests

1. Flying biting and voracious insect:

- Root flies
- Garlic flies
- Carrot rust flies
- Pollen beetles
- Striped flea beetles
- Slugs

2. Animals biting

- Hares, rabbits
- Important for overwintering vegetables (lettuce, Savoy cabbage, leek)

Protection against weed infestation

- Inter-row application – mulching
- Cost savings on cultivation, hoeing, herbicides

Ecological growing

Cost savings on pesticides

Protection against pollution

- Mulching (straw is better than fabrics for fruiting vegetable)

More effective soil use - prolonging of
vegetation period

1) Earlier sowing and planting

- Early vegetable (radish, lettuce,
kohlrabi)

- Earlier harvest - earlier sowing
(planting) of following cultures

2) Prolonging (delaying) of harvest
of last culture

- Up to several weeks when they fail to
comply agro-terms (leek)

Improving microclimate for plant growth

- Below foil - optimal microclimate
- Transmission of light, water, air
- Maintenance of uniform heat exchange
- Smaller fluctuations in temperature - heating, cooling
- Shortening of interval of impact of low temperatures at night
- Retention of heat radiation from soil
- Protection against frost (difference max. To 20c)
- Layer of ice on inside side – insulating function
- Maintenance of uniform moisture exchange
- Avoidance of unproductive vapour from the soil
- More favourable irrigation conditions
- Cost savings on irrigation

Use of individual vegetable species

species term of covering

- radish • immediately after seeding
- early lettuce • immediately after seeding iceberg lettuce
- early kohlrabi • mid-March

- Immediately after planting

- Beijing cabbage • immediately after planting term of uncovering
- 2 weeks before harvest

(April sowing)

- 3 weeks (March sowing)
- Not later - leaves at the expense of bulb
- 2 weeks before harvest • not later
- worse opening of heads
- lower quality
- until just before harvest (do not crack below NF)
- 10-14 days before harvest • later
- worse opening of heads , worse storability

species

- cucumber, zucchini
- winter leek
- tomato
- early potatoes
- brassicas – early term of covering term of uncovering
- immediately after sowing • during blooming

(3 weeks after germination)

- decrease of temperature below • in March
- 5°C, when rises on +5°C -> uncover regardless month – fungal diseases

- before planting - black - mulch
 - after planting
- white – covering
- immediately after planting
 - immediately after planting • in 2-3 weeks

(before blooming)

- before blooming
- month after planting

Cauliflower under NF

- can be harvested in December
- NF pushes leaves close to the rosette - rosette does not freeze
- Producer grows 2 ha of cauliflowers – this makes his living

Chicory Zuckerhut under NF

- Very good; uncover NF 14 days before harvest – helps create well-rolled heads

Kohlrabi under NF

- No cracking – more moisture, bulb does not dry out, tissues hold together, 50% of kohlrabi crack without fabrics

Potato

- Accelerated growth, sold in May for 20 CZK.kg-1
- Use of waste fabrics –cheaper