

## Soil preparation machinery and classification problems

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### **Abstract:**

*Forest soil preparation in the applied work is based on four principles of soil preparation - trenching, drilling, ploughing, and milling. The mechanisms can easily identify, which are based on the trenching and drilling tillage principles. The tendency of practitioners and scientists unrecognized the forest soil ploughing and milling principles for a long time. The reason is the different understanding of the cultivation process and mechanism of names in different languages. Looking at tillage theory succeeded in creating a transparent and clear forest soil treatment facility classification.*

**Keywords:** mechanism of forest soil preparation

### **1 Introduction**

Successful, high-quality, intensive reforestation require tillage (Upītis H. 1931). Non-agricultural lands (Daugaviete M. 2000) possible continuous tillage, but tillage clearcut area such way is problematic strains and roots. This is a reason to diversify the forest soil treatments. Regardless of tillage principles is only 4 and they are as follows:

- Ekskavation (Trenching)
- Milling;
- Drilling;
- Ploughing.

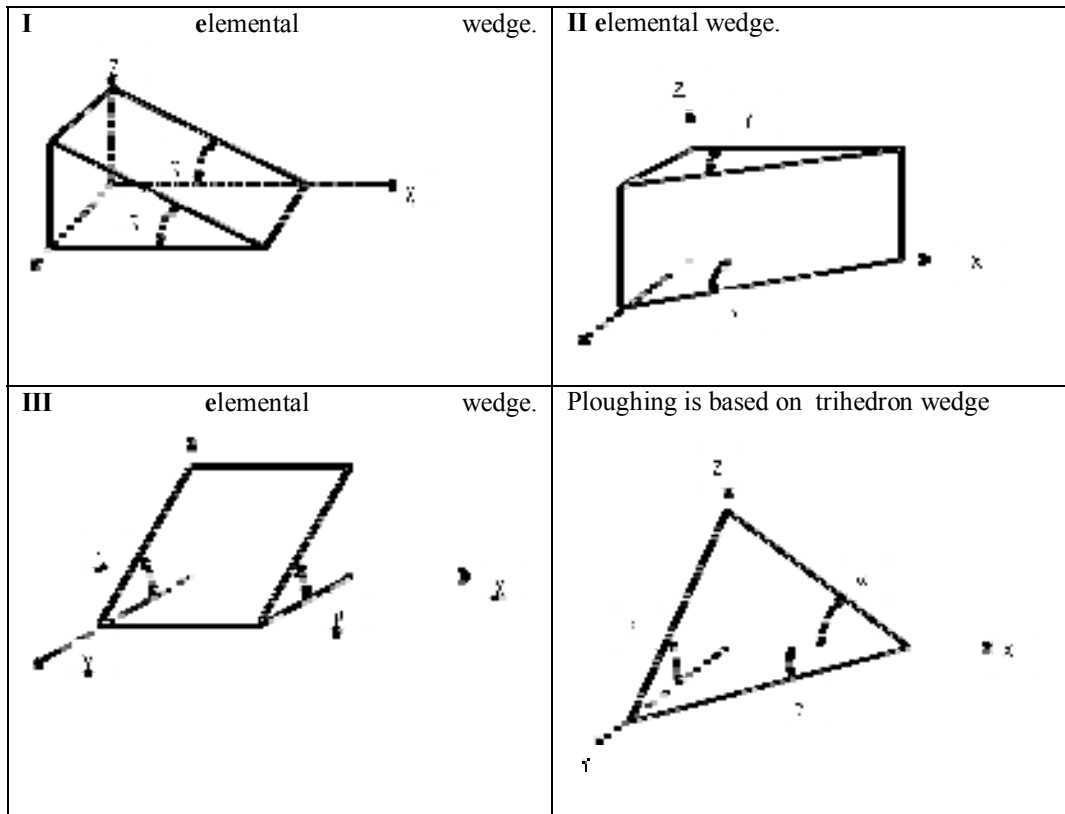
Tillage mechanism for classification according to their operating principles, often do not understand the two reasons:

- 1st - Insufficient theoretical knowledge
- 2nd - Language problems

**2 Materials and methods**

**2.1 Ploughing**

The theoretical part of the ploughing process developed by Russian academician V. Gorjackin. It states that all forms of ploughing is based on three basic activities of wedges ( Gasiņš L.1975)



**Figure 1: Theori of the ploughing process**

So far, many authors (Mangalis I. 1989, Mangalis I, Liepa J. 1980, Mangalis I 2004, [www.brackeforest.com](http://www.brackeforest.com)) have not been able to understand the membership of a disk plough ploughs

**3 Results and discussion**

**3.1 Excavations (Trenching)**

Row moulder's are one of excavator excavation possibilities. Excavator is possible made from shallow to deep depth of a pit and diferent size turf. Its illustrated in Figure 1 and Table 1



Figure 2: Principle of Excavations (Trenching) ([www. brackeforest.com](http://www.brackeforest.com))

Table 1: Excavations mechanisms names in different languages (<http://www.otljarocin.lasy.gov.pl>)

	English	Deutsch	По русски	Latviski
1.	ROLLER CULTIVATOR WUP	Walze zur plätzeweisen Bodenbearbeitung WUP	Вал обрабатывающий WUP	Kupicotājs WUP
2.	TRIPLE KNIVE CULTIVATION ROLLER WT	Bodenbearbeitungswalze WT	Вал обрабатывающий WT	Kupicotājs WT

### 3.2 Milling



Figure 3: Principle of Milling (<http://www.otljarocin.lasy.gov.pl>)

**Table 2: Milling mechanisms names in different languages (<http://www.otljarocin.lasy.gov.pl>)**

	English	Deutsch	По русски	Latviski
1.	FIXED KNIVE SHREDDER RS	ZERKLEINERUNGSMASCHINE MIT FESTEN ZÄHNEN RS	Дробилки с неподвижными зубьями RS-15, RS-20, RS-22	Nekustīgo zobu frēze  RS-15, RS- 20, RS-22
2.	FOREST MILL FL	Forstfräsen FL	Фреза лесная FL	Meža frēze FL

### 3.3 Drilling

Forest soil drill


**Figure 4: Principle of Forest soil drilling (<http://www.otljarocin.lasy.gov.pl>)**

**Table 3: Drilling mechanisms names in different languages (<http://www.otljarocin.lasy.gov.pl>)**

	English	Deutsch	По русски	Latviski
1.	DRILL WPG	BOHRER FÜR PLÄTZE UND EINZÄUNUNGEN WPG	Сверло WPG	Meža augsnes urbis WPG

### 3.4 Ploughing


**Figure 5: Classical forest plough (<http://www.otljarocin.lasy.gov.pl>)**
**Table 4: Classical forest plough names in different languages (<http://www.otljarocin.lasy.gov.pl>)**

	English	Deutsch	По русски	Latviski
1.	DOUBLE MOULD- BOARD PLOUGH WITH DEEPENER LPz-OTL	Waldpflug mit beiderseitigem Streichblech und Untergrundlockerer LPz- OTL U 074/1	Плуг двухотвальный LPz	Divpusvērsējs arkls ar dziļirdinātāju  LPz-OTL



Figure 6. Classical forest active disk plough (<http://www.otljarocin.lasy.gov.pl>)

Table 4: Classical forest active disk plough names in different languages (<http://www.otljarocin.lasy.gov.pl>)

	English	Deutsch	По русски	Latviski
1.	ACTIVE SINGLE-DISC PLOUGH P1T	P1T Aktiver Einscheiben-Pflug	Плуг активный P1T	Aktīvais divkorpusu disku arkls P1T
2.	DOUBLE-DISC PLOUGH P2Tc	AKTIVE ZWEISCHEIBEN-PFLÜGE FÜR ACKERSCHLEPPER	Плуг активный P2Tc	Aktīvais divkorpusu arkls P2Tc

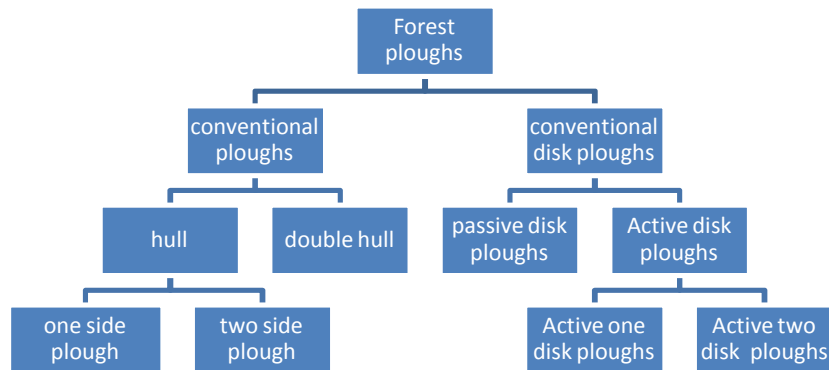


Figure 7: Disk trencher T21.a Scheibenegge T21.a. ([www.brackeforest.com](http://www.brackeforest.com))

The Bracke T21.a is designed for smaller forwarders and larger agricultural tractors and is ideal for scarifying smaller sites. Scarification with the T21.a gives plants and seeds a good start for growth and survival (www.brackeforest.com) Brackeforest in home page writing „Scarification with the T21.a” This is correct?

From the picture 7 (www.brackeforest.com) is clear –soil preparing with the T21.a is a ploughing result

To clarify the classification of forest plough, I propose a new scheme (Figure 8.)



**Figure 7: Forest plough Classification**

#### 4 Conclusion

- So far, tillage tools are not designed for a single classification
- Common practice is mixed with the soil types of treatment principles
- Perspective, should develop a mechanism for soil preparation classifier holistic understanding of soil preparation.
- The first plough forest classification scheme are developed.

#### 5 References

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<http://www.brackeforest.com>